

Republic of Tunisia

Ministry of Development, Investment, and International Cooperation (MDICI),

South Development Office (ODS)

**Project on Regional Development Planning
of the Southern Region
in the Republic of Tunisia**

Final Report

Part 2

Regional Development Plan of the Southern Region

November, 2015

JICA (Japan International Cooperation Agency)

**Yachiyo Engineering Co., Ltd.
Kaihatsu Management Consulting, Inc.
INGÉROSEC Corporation**

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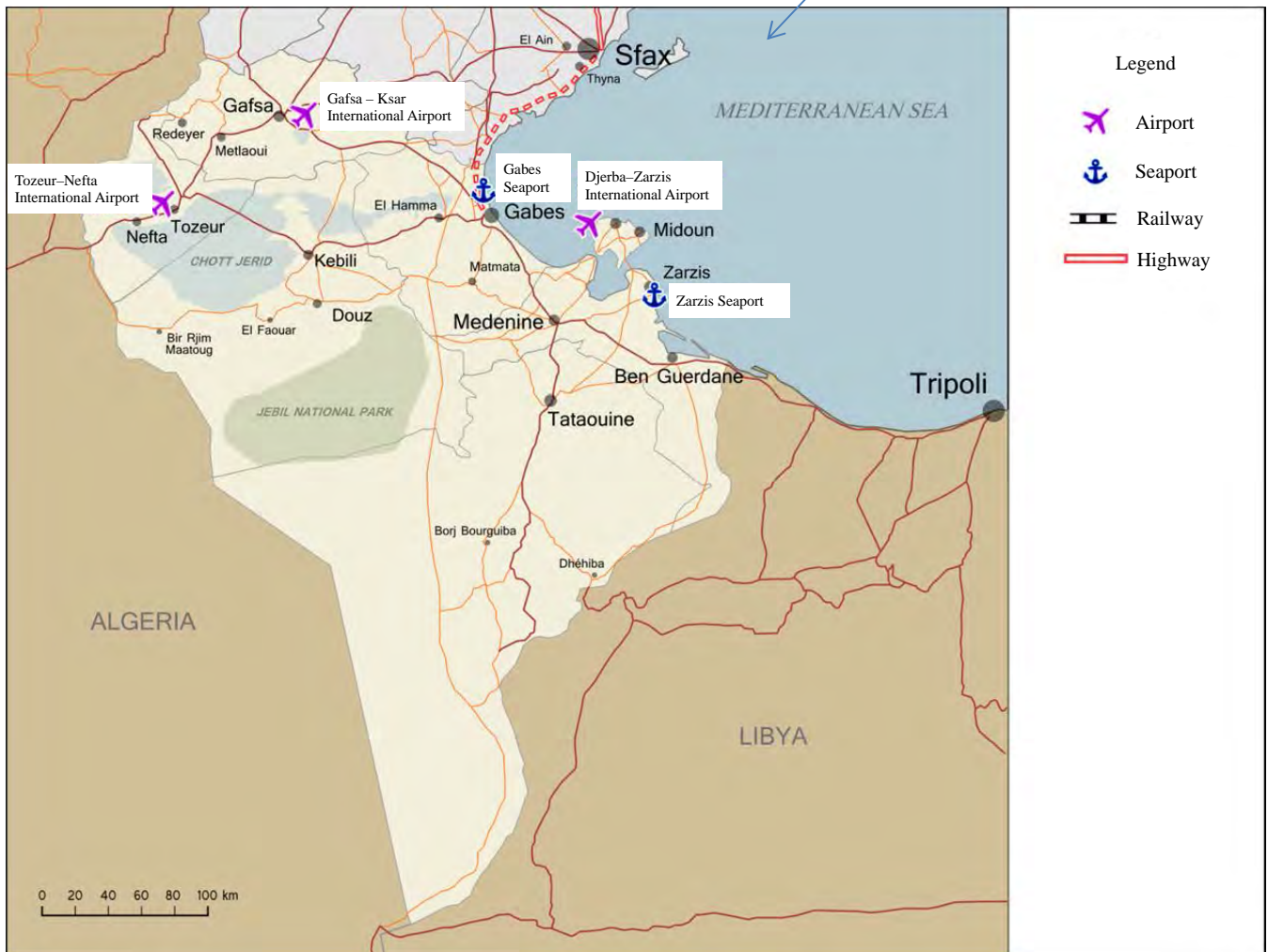
**Yachiyo Engineering Co., Ltd.
Kaihatsu Management Consulting, Inc.
INGÉROSEC Corporation**



Location of Tunisia



Tunisia and surrounding countries



Target Area (Six Governorates in the Southern Region)

Final Report Part 2
Project on Regional Development Planning of the Southern Region,
in the Republic of Tunisia

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List of Abbreviations

Abbr	English	French
AADT	Annual Average Daily Traffic	Trafic Moyen Journalier Annuel
AFD	French Development Agency	Agence Française de Développement
AFT	Tourism Real Estate Agency	Agence Foncière Touristique
AG	Agriculture, fishery, livestock breeding and food processing	Agriculture, pêche, élevage et transformation des produits alimentaires
AMVPPC	Agence de Mise en Valeur du Patrimoine et de la Promotion Culturelle	Agence de Mise en Valeur du Patrimoine et de la Promotion Culturelle
ANGED	National Agency of Waste Management	Agence Nationale de Gestion des Déchets
ANME	National Agency for Energy Conservation	Agence Nationale pour la Maîtrise de l'Energie
ANPE	National Agency for Environmental Protection	Agence Nationale de Protection de l'Environnement
AOT	Regulatory Transport Authority	Autorité organisatrice des transports
APIA	Agency of Promotion of Agricultural Investments	Agence de Promotion des Investissements Agricoles
APII	Agency of Promotion of Industry and Innovation	Agence de Promotion de l'Industrie et de l'Innovation
AR	Augmented Reality	Réalité augmentée
AfDB	African Development Bank	Banque Africaine de Développement
ATTT or A3T	Land Transport Agency	Agence Technique des Transports Terrestres
BAD	African Development Bank	Banque Africaine de Développement
BEI	European Investment Bank	Banque Européenne d'Investissement
BFPME	Bank for Financing of Small and Medium Enterprises	Banque de financement des petites et moyennes entreprises
BNA	National Agricultural Bank	Banque Nationale Agricole
BOD	Biological Oxygen Demand	Demande Biologique en Oxygène
BRT	Bus rapid transit	Bus à haut niveau de service (BHNS)
BTS	Tunisian Solidarity Bank	Banque Tunisienne de Solidarité
C/P	Public consultation	Consultation Publique
CBT	Community Based Tourism	Tourisme communautaire
CDC	Deposit and Consignment Vehicle	Caisse de Dépôts et de Consignation
CEPEX	Tunisian Export Promotion Center	Centre de Promotion des Exportations de la Tunisie
CERT	Research and Studies Telecommunications Centre	Centre d'Etudes et de Recherche des Télécommunications
CES	Conservation of Water and Soil	Conservation des Eaux et des Sols
CITET	Tunis International Center for Environmental Technologies	Centre International des Technologies de l'Environnement de Tunis
CONNECT	Confederation of Citizen Enterprises of Tunisia	Confédération des Entreprises Citoyennes de Tunisie
CPG	Phosphate Company of Gafsa	Compagnie des Phosphates de Gafsa
CPV	Concentrating Photo Voltaics	Photovoltaïque concentré
CRDA	Regional Commissioner's Office of Agricultural Development	Commissariat Régional de Développement Agricole
CRPD	Provisional Regional Council for Development	Conseil Régional Provisoire pour le Développement
CRTE	Research and Technology Center of Energy	Centre de Recherche et des Technologies de

Abbr	English	French
		l'Energie
CSP	Concentrated Solar Power	Energie Solaire Concentrée
CT	Complexe Terminal	Complexe Terminal
DBO	Biological Oxygen Demand	Demande Biologique en Oxygène
DF/R	Draft Final Report	Rapport intermédiaire
DG	Director General	Directeur général
DGAC	General Directorate for Civil Aviation	Direction générale de l'aviation civile
DGRE	Directorate General of Water Resources	Direction Générale des Ressources en Eau
DMO	Destination Management Organizations	Organisations de gestion des destinations
DPS	Directorate of Planning and Statistics	Direction de la Planification et des Statistiques
DR	Demand Response	Effacement
DR	Regional Director	Directeur Régional
DRA	Demand Response Aggregator	Agrégateurs d'effacement
DRD	Regional Directorate of Development	Direction Régionale du Développement
DRE	Regional Directorates of Ministry of Equipment	Direction Régionale de l'Équipement
DRT	Regional Directorates of Ministry of Transport	Direction Régionale du Transport
DT	Tunisian Dinar	Dinar tunisien
ECOSO	East, Center West, South West corridor	Couloir Est, Centre Ouest, Sud Ouest
EES	Strategic Environmental Assessment	Évaluation Environnementale Stratégique
EIA	Environmental Impact Assessment	Étude d'Impacts sur l'Environnement
EIB	European Investment Bank	Banque Européenne d'Investissement
EIS	Environmental impact study	Étude d'impact environnemental
EIU	Economic Intelligence Unit	Unité d'Intelligence Economique
EOJ	Embassy of Japan	Ambassade du Japon
ETAP	Entreprise Tunisienne d'Activités Pétrolières	Entreprise Tunisienne d'Activités Pétrolières
EU	European Union	Union Européenne
EUR	Euro	Euro
F/R	Final Report	Rapport Final
F/S	Feasibility Study	Étude de faisabilité
FAMEX	Export Market Access Fund	Fonds d'Accès aux Marchés d'Exportation
FAO	Food and Agriculture Organization of the United Nations	Organisation des Nations Unies pour l'alimentation et l'agriculture
FDI	Foreign Direct Investment	Investissement Direct Etranger
FEZ	Free Economic Zone	Zone économique de libre-échange
FIPA	Foreign Investment Promotion Agency	Agence de Promotion de l'Investissement Extérieur
FMI	International Monetary Fund	Fonds monétaire international
FNME	National Fund for Energy Saving	Fonds national de maîtrise de l'énergie
FONAPRAM	Fonds National de Promotion de l'Artisanat et des Petits Metiers	Fonds National de Promotion de l'Artisanat et des Petits Métiers
FOPRODI	Fund for Industrial Promotion and Decentralisation	Fonds de Promotion et de Décentralisation Industrielle
FOSDA	Special Fund of Agricultural Development	Fonds Spécial de Développement Agricole
FTA	Free Trade Agreement	Accord de Libre-échange
FTAV	Tunisian Federation of Travel Agencies and Tourism	Fédération Tunisienne des Agences de Voyages et de Tourisme

Abbr	English	French
FTH	Tunisian Federation of Hotels	Fédération Tunisienne de l'Hôtellerie
GCT	Tunisian Chemical Groupe	Groupe Chimique Tunisien
GDA	Agricultural Development Grpoup	Groupement de Développement Agricole
GDP	Gross Domestic Product	Produit Intérieur Brut
GFCF	Gross Fixed Capital Formation	Formation brute de capital fixe
GIZ	German Federal Enterprise for International Cooperation	Agence de Coopération Internationale Allemande pour le Développement
GRDP	Gross Regional Domestic Product	Produit Intérieur Brut Régional
GW	Giga Watt	Giga Watt
GWh	Giga Watt hour	Giga Watt heure
Gbps	Giga bit per second	Gigabit par seconde
GdT	Government of Tunisia	Gouvernement de la Tunisie
GoT	Government of Tunisia	Gouvernement de la Tunisie
HC	Handicrafts	Secteur artisanal
IC/R	Inception Report	Rapport de commencement
ICG	Chemical Industry of Gafsa	Industrie Chimique de Gafsa
ICT	Information, Communication and Technology	Technologies de l'Information et de la Communication
IDE	Foreign Direct Investment	Investissement Direct Etranger
IEA	International Energy Agency	Agence internationale de l'énergie
IME	Investment, marketing, and export	Investissement, marketing, et de l'exportation
IMF	International Monetary Fund	Fonds monétaire international
INP	National Heritage Institute	Institut National du Patrimoine
INS	National Statistics Institute	Institut de la Statistique
IPP	Independent Power Producer	Producteur indépendant d'électricité
IRA	Arid Regions Institute	Institut des Régions Arides
IRACOV	Regional Indicators of Improvement of Living Conditions	Indicateurs Régionaux d'Amélioration des Conditions de Vie
IT/R	Interim Report	Rapport intermédiaire
IT/R	Interim Report	Rapport intermédiaire
ITCEQ	Tunisian Institute of Competitiveness and Quantitative Studies	Institut Tunisien de la Compétitivité et des Etudes Quantitatives
IUCN	International Union for Conservation of Nature	Union internationale pour la conservation de la nature
JATA	Japan Association of Travel Agents	Association japonaise des agences de voyages
JET	JICA Expert Team	Equipe d'experts de la JICA
JICA	Japan International Cooperation Agency	Agence Japonaise de Coopération Internationale
KfW	Reconstruction Credit Institute	Etablissement de crédit pour la reconstruction (Allemagne)
LAN	Local Area Network	Micro-réseaux locaux
LGV	High-speed Railway Line	Ligne à Grande Vitesse
LPI	Logistics Performance Index	Indice de performance logistique
LRT	Light rail transport	Métro léger, en Tunisie "Métro"
M/E or S/E	Monitoring/evaluation	Suivi/évaluation
MAF	Ministry of Social Affairs	Ministère des Affaires Sociales
MARHP	Ministry of Agriculture, Water Resources and	Ministère de l'Agriculture, des Ressources

Abbr	English	French
	Fisheries	Hydrauliques et de la Pêche
MCSP	Ministry of Culture and Heritage Protection	Ministère de la Culture et du Sauvegarde de la Patrimoine
MDICI	Ministry of Development, Investment, and International Cooperation	Ministère du Développement de l'Investissement et de la Coopération internationale
MEATDD	Ministry of Equipment, Housing and Spatial Planning	Ministère de l'Équipement, de l'Aménagement du Territoire
MEFP	Ministry of Employment and Vocational Training	Ministère de l'Emploi et de la Formation Professionnelle
MEHAT	Ministry of Construction, Housing and Land Planning	Ministère de l'équipement, de l'habitat et de l'aménagement du territoire
MENA	Middle East and North Africa	Moyen-Orient et Afrique du Nord
MESRS	Ministry of Higher Education and Scientific Research	Ministère de l'Enseignement Supérieur et de la Recherche Scientifique
MEUR	Million Euro	Millions d'Euros
MI	Ministry of Interior	Ministère de l'Intérieur
MICE	Meetings, Incentives, Conferences and Exhibitions	Réunions, Congrès, Conventions, et voyages de gratification
MIEM	Ministry of Industry, Energy and Mines	Ministère de l'Industrie, de l'Energie et des Mines
MJS	Ministry of Youth and Sports	Ministère de la Jeunesse et du Sport
MJSFF	Ministry of Woman and Family and Children	Ministère de la Femme, la Famille, et l'Enfance
MN	Mining and other industrial sectors	Mines et autres secteurs industriels
MTA	Ministry of Tourism and Handicraft	Ministère du tourisme et de l'Artisanat
MTR	Ministry of Transport	Ministère du transport
MRDP	Ministry of Regional Development and Planning	Ministère du Développement régional et de la Planification
MW	Mega Watt	Mega Watt
NESDP or PNDES	National Economic and Social Development Plan	Plan national de développement économique et social
NGO	Non-governmental Organization	Organisation Non Gouvernementale
OACA	National office of the Civil Aviation and Airport	Office de l'Aviation Civile et des Aéroports
OACI	International Civil Aviation Organization	Organisation de l'Aviation Civile Internationale
OD	Origin-Destination	Origine-Destination
ODA	Official development Assistance	Aide publique au développement (APD)
ODS	South Development Office	Office de Développement du Sud
OECD or OCDE	Organisation for Economic Co-operation and Development	Organisation de Coopération et de Développement Économiques
OEM	Operation and maintenance	Opération et maintenance
OMMP	Agency for Merchant Navy and Ports	Office de la Marine Marchande et des Ports
ONAS	National Office of Drainage	Office National de l'Assainissement
ONAT	Tunisia National Handicraft Office	Office National de l'Artisanat Tunisien
ONSR	National Road safety Observatory	Observatoire national de la sécurité routière
ONTT	National office of the Tunisian Tourism	Office National Tunisien du Tourisme
OTEDD	Observatoire Tunisien de l'Environnement et du Développement Durable	Observatoire Tunisien de l'Environnement et du Développement Durable
P/C	Public consultation	Consultation Publique
PAE	Zarzis Park of Economic Activities	Parc d'Activités Economiques de Zarzis
PAX	Passenger	Passager

Abbr	English	French
PDES	Water Master Plan of South	Plan Directeur des Eaux du Sud
PG/R	Progress Report	Rapport d'avancement
PIB	Gross Domestic Product	Produit Intérieur Brut
PIBR	Gross Regional Domestic Product	Produit Intérieur Brut Régional
PNDA	National Program of Handicraft Development	Le Programme National de Développement de l'Artisanat
PPA	GDP per capita	PIB par habitant
PPP	Public Private Partnership	Partenariat Public-Privé
PPP	GDP per capita	PIB par habitant
PRDA	Regional Programme of handicrafts development	Programme Régional de Développement de l'Artisanat
PS	Power supply	Approvisionnement en électricité
PST	Plan Solaire Tunisien	Plan Solaire Tunisien
PV	Photo Voltaics	Photovoltaïques
R/A	Progress Report	Rapport d'avancement
R/C	Inception Report	Rapport de commencement
R/I	Draft Final Report	Avant-Projet du Rapport Final
R/I	Interim Report	Rapport intermédiaire
R&D	Research and development	Recherche et développement
RA	Augmented Reality	Réalité augmentée
RC/P	Public consultation meeting	Réunions de consultation publique
RE	Renewable Energy	Energie Renouvelable
RER	Regional Express Network	Réseau Express Régional
RL	Local Road	Route Locale
RN	National Road	Route Nationale
RP	Regional Planning	Planification régionale
RR	Regional Road	Route Régionale
S3T	South Tunisia Transport infrastructure Taskforce	Mission des transports du sud tunisien
SDARE	Master Plan of Economic Region	Schéma Directeur d'Aménagement de la Région Economique
SEA or EES	Strategic Environmental Assessment	Evaluation environnementale stratégique
SEDCI	Secretary of State for Development and International Cooperation	Secrétaire d'État au Développement et à la Coopération Internationale
SICAR	Investment Company in Risk Capital	Société d'Investissement à Capital Risque
SMSA	Mutual Company of Agricultural Services	Société Mutuelle de Services Agricoles
SMEs	Small and Medium Scale Enterprizes	Petites et moyennes entreprises
SNCFT	National Company for Railway in Tunisia	Société Nationale des Chemins de Fer Tunisiens
SNTRI	National Company for Interurban Transport	Société Nationale de Transport Interurbain
SODIS	Development and Investment Company of the South	Société de Développement et d'Investissement du Sud
SONEDE	National Water Distribution Utility	Société Nationale d'Exploitation et de Distribution des Eaux
SRT	Regional Company for Transport	Société Régionale de Transport
STEG	Tunisian Company of Electricity and Gas	Société Tunisienne de l'Electricité et du Gaz
STEP	Waste Water Treatment Plants	Stations d'épuration des eaux usées
SWH	Solar Water Heating	Chauffe-eau solaire
TC	Telecommunication	Télécommunication

Abbr	English	French
TIC	Information, Communication and Technology	Technologies de l'Information et de la Communication
TM	Tourism	Tourisme
TMJA	Annual Average Daily Traffic	Trafic Moyen Journalier Annuel
TND	Tunisian Dinar	Dinar tunisien
TR	Transport	Transport
TRAPSA	Transport Pipeline Company in the Sahara	Compagnie des transports par pipe-line au Sahara
TT	Tunisia Telecom	Tunisie Telecom
TTCI	Travel and Tourism Competitiveness Index	Indice de la Compétitivité du Voyage et du Tourisme
UGTT	Tunisian General Work Union	Union Générale Tunisienne du Travail
UMA	Arab Maghreb Union	Union du Maghreb Arabe
UMIC	Upper Middle Income Countries	Pays à revenu intermédiaire (tranche supérieure)
UNCTAD	United Nations Conference on Trade and Development	Conférence des Nations Unies sur le Commerce et le Développement (CNUCED)
UNESCO	United Nations Educational, Scientific and Cultural Organization	Organisation des Nations Unies pour l'éducation, la science et la culture
URAP	Regional Union of Agriculture and Fishery	Union Régional de l'Agriculture et de la Pêche
UTAP	Tunisien Union of Agriculture and Fishery	Union Tunisienne de l'Agriculture et de la Pêche
UTICA	Tunisian Union of Commerce, Industry and Handcraft Industry	Union Tunisienne du Commerce, de l'Industrie et de l'Artisanat
WA	Water supply and waste water treatment	Approvisionnement en eau et traitement des eaux usées
WM	Water resource management	Gestion des ressources en eau
WWTP	Waste Water Treatment Plants	Stations d'épuration des eaux usées
ZSAE	Socio-Agro-Ecological Areas	Zones Socio-Agro-Ecologiques

CHAPTER 1 PLANNING FRAME AND SOCIO-ECONOMIC

FRAMEWORK FOR DEVELOPMENT OF THE SOUTHERN REGION

1.1 Planning Frame

1.1.1 Structure of the regional development plan

The structure of the development plan for the Southern Region¹ formulated by the Project is shown in Figure 1.1-1. The plan is composed of a goal, a vision, and sets of strategies, plans and action plans, which are defined in the same figure.

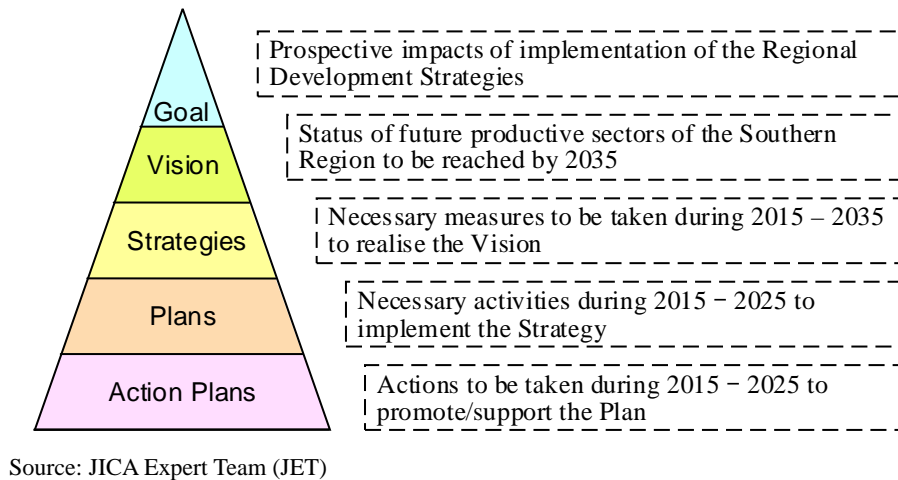


Figure 1.1-1 Composition of the regional development plan

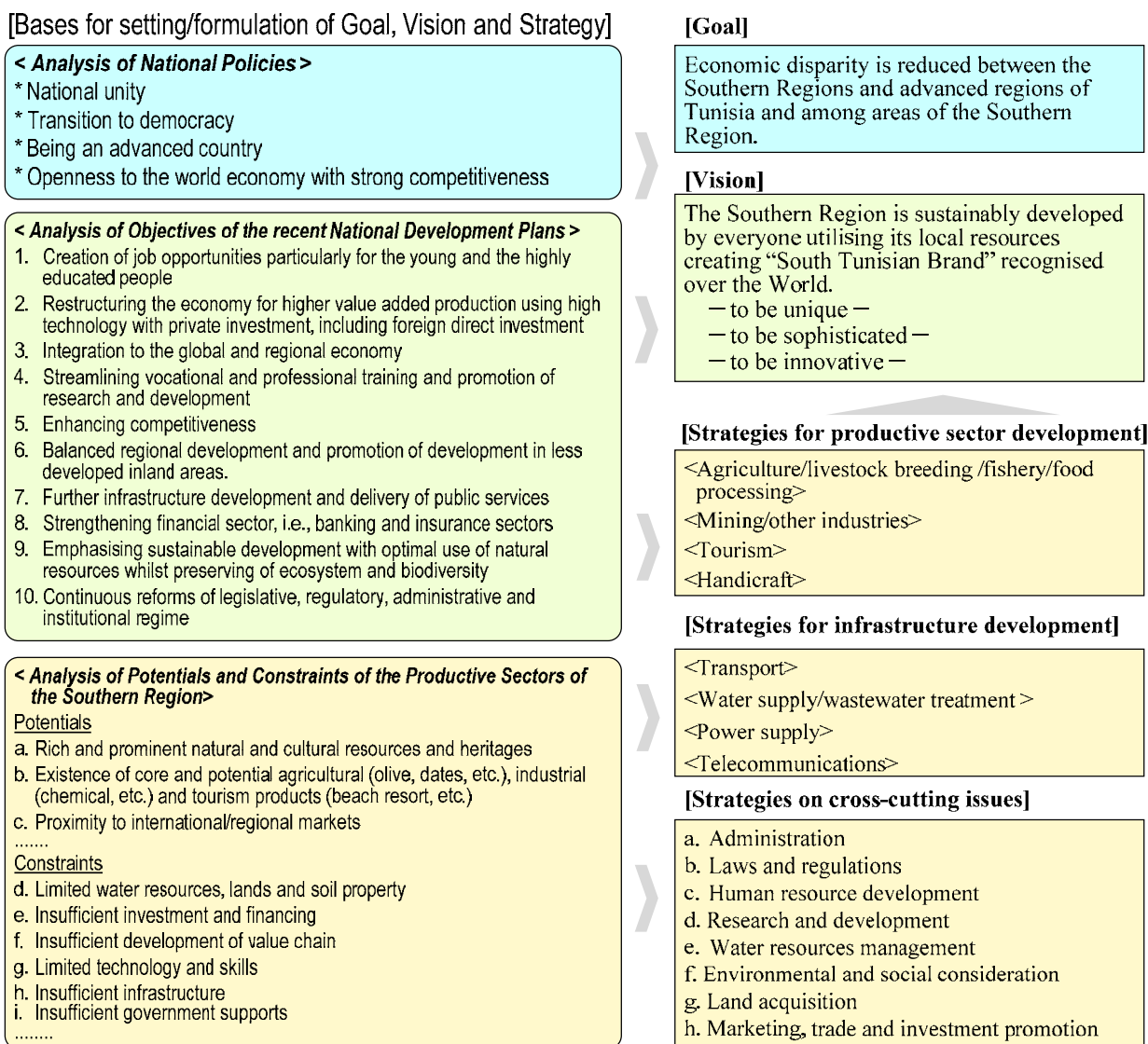
The ‘Goal’ is defined as prospected impacts towards which the strategies and plans are formulated. The goal shows an overall objective that is expected to be achieved not only by implementation of the strategies and plans but also through other development efforts. Besides, the ‘Vision’ is defined as the status of the future productive sectors of the Southern Region that can be achieved by the implementation of ‘Strategies’. The goal is an ‘overall goal’, while the vision is the ‘purpose’ of a logical framework. As the indicators of the level of achievement of the Vision set below might be heightened by activities other than those proposed by the Project, attainment levels are explicitly set to show possible direct effects of implementation of the ‘Strategies’ and ‘Plans’. Indirect effects are also estimated and aggregated status of the direct and indirect effects for 2025 and 2035 are compared with the estimated Tunisian average status.

The ‘Strategies’ mean ideas of measures to be taken during the long term of 2015 – 2035, while the ‘Plans’ indicates detailed activities to be taken in the short or medium term of 2015 – 2020 or 2015 – 2025 regarding i) institutional and human capacity development, ii) facility and infrastructure development and iii) financing and investment.

¹ The “Southern Region” includes jurisdictions of Governorates of Gabès, Médenine, Tataouine, Gafsa, Tozeur and Kébili. The former three jurisdictions are sometimes called as the “South-east Region”, and the latter three as “South-west Region”. It should be noted that central ministries or the state agencies generally do not have their branch offices at the level of “Southern Region”, “South-east Region” or “South-west Region”, with an exception of the South Development Office (ODS) of the Ministry of Development and International Cooperation, but only at the governorate level, and that the word “region” generally means a jurisdiction of a governorate.

Detailed explanation on the goal and the vision are shown below in Section 1.1.3 and 1.1.4, respectively, while the strategies, plans and action plans are described in detail in Chapter 3 of Part II of this report.

The goal, vision and strategies for the development of the Southern Region are set as shown in Figure 1.1-2. Bases for setting the goal, vision and strategies are also described in the same figure. The goal, vision and strategies are set as results of analyses of recent national economic and social development plans, and analyses and reviews of regional development policies and strategies as well as analyses of potentials and constraints of the productive sectors of the Southern Region through field surveys of JICA Expert Team (JET).



Source: JET

Figure 1.1-2 Goal, vision and strategies for the development of the Southern Region

1.1.2 Identification of bases for setting and formulation of the goal, vision and strategies for the development of the Southern Region

For setting and formulation of the goal, vision and strategies for the development of the Southern Region, policy and strategy papers in Tunisia are analysed as described in Chapter 2 and Chapter 7 of Part 1 of this report to identify bases for the setting and formulation. For the identification, analyses of development potentials and constraints are also conducted by JET mainly through field surveys in

Tunisia. Four ‘national policies’, ten ‘objectives of the recent national development plans’, and major ‘potentials’ and ‘constraints of the Southern Region as listed in Figure 1.1-2 are identified as bases of the setting and formulation.

The goal and the vision are set based on the 'national policies' and 'objectives of the recent national development plans' with a recognition that the goal and the vision of the regional development should be in line with the national policies and objectives. Besides, the strategies are formulated based mainly on the results of analyses of ‘potentials and constraints of the Southern Region’, considering that effective implementation of the strategies and achievement of the vision are highly affected by the situation, characteristic and circumstances of the Southern Region.

1.1.3 Goal of the regional development

The goal of the regional development is set as follows:

Economic disparity is reduced between the Southern Regions and advanced regions of Tunisia and among areas of the Southern Region.

Balanced regional development would be the most important policy of every nation of the world for its unity as a nation. In addition, in the context of Tunisia, imbalanced regional development and frustration caused by it could be recognised as a trigger of the Revolution. Every development policy in Tunisia emphasises balanced regional development and allocates more resources to less developed regions.

The scope of the goal covers only reduction of economic disparity, and approaches of the Projects stated in the Inception Report are limited to productive sectors and issues of investment/ marketing/export as well as infrastructure development to support the productive sectors, with a recognition that the priority issues on the development of the Southern Region for the coming two decades should be reduction of unemployment and achievement of inclusive development through proper economic development.

“Per capita household consumption” is set as the target indicator of the achievement of the goal, after checking data availability to estimate and forecast the figures of the target indicator for the national average and the Southern Regions, and the coastal and inland² areas of the Southern Region in 2015, 2025 and 2035. As the Southern Region is divided into South-east and South-west economic regions as well as statistical units, comparison would be conducted between the South-east and the South-west Regions instead of between the coastal and the inland areas of the Southern Regions because of availability of the past data on the target indicator.

1.1.4 Development vision

Development vision is defined as “status of future productive sectors of the Southern Region to be reached by 2035”. The development vision is set as follows:

² “Coastal areas” in the Project means areas or jurisdictions of the Governorates of Gabès and Médenine, and “inland areas” covers areas or jurisdictions of the Governorates of Tataouine, Gafsa, Tozeur and Kébili.

The Southern Region will be *sustainably* developed with *more employment* for everyone creating *higher value* and keeping *strong competitiveness* in the world economy. — to be *sophisticated, unique, and innovative* —

The vision implies three elements: i) *sustainable development*, ii) inclusive development with less unemployment and *more job creation*, and iii) *strong competitiveness* in the world economy *with higher value added*.

Sustainable development is regularly set as an important objective in the recent national economic and social development plans and other development plans in Tunisia. No development plan without considering sustainable development was found. Sustainable development in this planning focusses on long lasting use of limited natural resources, preservation of natural and cultural resources of the region as well as pollution control.

Target indicators of this objective are those related to use of water resources, which are quite limited in the Southern Region, and the ratio of electricity generated with renewable energy to the total electricity generated or used in Tunisia. Due to scarcity of water resources in the Southern Region, their sustainable use is quite important for the development of the region. In Tunisia, more than 80% of the electricity is generated with fossil fuels, mainly natural gas at the moment, and more than 70% of them are imported at present. The Ministry of Industry, Energy and Mining established a national agency specialised for promotion of renewable energy, set up a target of share of use of renewable energy, and promulgated a special law for the promotion.

More job creation is always placed as the top priority in the recent national economic and social development plans as well as regional development policies and strategies. Any development plans in Tunisia have to have the objective of job creation. Highlighted issues on unemployment have been those for the young and the higher education graduates, and the regional development strategies should focus on creating jobs for them. Participation of women in productive sectors also has to be encouraged.

The target indicator of the achievement of job creation is set as unemployment rate or number of job created per capita of economically active population. The national unemployment rate or the number of jobs created per capita of economically active population³ is compared with the figures of the Southern, South-east and South-west Regions to analyse the regional disparity in terms of employment.

Tunisia's economic policy has inclined to open its economy to the world economy, having considerably smaller size domestic market, being located in a good position to the south Mediterranean Sea, and having a long history of trading with Mediterranean and Maghreb countries, such as France, Italy, Spain, Greek as well as Libya and Algeria. Although the openness offers opportunities for exports, it exposes the economy to harsh competitions in all exportable and importable goods and services at the same time. Therefore, the Tunisian economy has to be *highly competitiveness*.

³ "Economically active population" consists of people of working age (15 years and over) who are employed or unemployed during a reference week. "Employed" means any person aged 15 years and over who worked at least one day (was it one hour with or without consideration and with the exception of volunteer work) during the reference week is considered employed. "Unemployed" means any person aged 15 years and over who has not worked during the reference week, who is seeking a job, who has had an active job search approach or who is available for work during the two weeks following the reference week is considered as unemployed.

At present, Tunisia is ranked as a middle-income country and intends to be an advanced country. To become an advanced country, the economy of Tunisia, as well as that of the Southern Region, has to *increase value-added* per capita. To keep competitiveness with high value-added per capita or raised wage level, the economy of Tunisia and the Southern Region will have to be upgraded *to more unique, sophisticated and innovative* economy.

Although increased value-added per capita and high competitiveness are important element of the development vision of the Southern Region, the target indicators of the two elements are not set since the baseline data of per capita value-added in the Southern Region as well as competitiveness in general are not available as no statistical or research institute regularly collect these data.

1.1.5 Target productive sectors

Target productive sectors for the study of the Project have been decided as a) agriculture, fishery, livestock breeding and food processing (whose strategies, plans and action plans are described in Section 3.2.1 of this report), b) mining and other industrial sectors (including renewable energy, refer to Section 3.2.2), c) tourism (Refer to Section 3.2.3), and d) handicraft (Refer to Section 3.2.4) with the following steps.

In the Record of Discussions, JET members for productive sectors are limited to those in charge of i) industrial promotion, ii) trade promotion/marketing, iii) agro/fishery-processing, and iv) tourism. As for ii), JET added ‘investment attraction’ and deems that the expert of ‘investment attraction/marketing/trade promotion’ does not deal with a specific productive sector but is involved in ‘investment attraction/marketing/trade promotion’ for productive sectors of i), iii) and vi). At present, ‘investment attraction/ marketing/trade promotion’ are regarded as cross-cutting issues.

Referring strategies of the six governorates and results of public consultation meetings of the first round, JET has examined the possibility of adding v) handicraft, as a separate productive sector, vi) renewable energy, as a sub-sector of mining and other industrial sectors. With analyses of potentials and constraints, JET has decided to include these two sectors and to propose strategies, plans and action plans for the two sectors.

Besides, JET analysed potentials and constraints of vii) information and communication technology (ICT) sector. As a result, JET concluded that ICT can be used for the promotion of the productive sectors of i), iii) and vi) and ICT sector should not dealt as a separate sector in the Project. JET also analysed current status of viii) electric and electronic sector and concluded not to include the sector as a separate or as a sub-sector of mining and other industrial sectors as the electric and electronic sector does not have rigid technology base.

1.2 Setting socio-economic framework

This section describes forecasted data for the basic social and economic indicators in Tunisia and the Southern Region. These forecasts will become the basis for the planning to understand circumstances as well as for setting indicators to be used for the achievement and progress of the proposed strategies and plans. As the target year of the strategies is 2035, whereas the target year of plans is 2025, these socio-economic data are forecasted up to 2035.

1.2.1 Population

(1) Population of Tunisia

Institut de la Statistique (INS) has estimated the population of Tunisia up to 2039 based on the population census in 2004. The Project uses these data forecasted by INS as the baseline forecast. Table 1.2-1 depicts the forecasted annual population growth rate up to 2039. The growth rates are estimated to decrease gradually during the target periods.

Table 1.2-1 Forecasted annual population growth rate for Tunisia (%)

Period	Annual population growth rate
2009-2014	1.08%
2015-2019	1.00%
2020-2024	0.81%
2025-2029	0.61%
2030-2034	0.46%
2035-2039	0.27%

Source: elaborated by JICA Expert Team (JET) based on INS data

Table 1.2-2 shows forecasted population of Tunisia up to 2035. It is estimated to increase to 12,148,800 in 2025 (target year of plans) and to 12,776,600 in 2035 (target year of strategies).

Table 1.2-2 Forecasted population for Tunisia (unit: thousand)

Year	Population in Tunisia	Year	Population in Tunisia
2016	11,258.2	2026	12,223.4
2017	11,370.4	2027	12,298.5
2018	11,483.7	2028	12,374.0
2019	11,598.2	2029	12,450.0
2020	11,692.0	2030	12,507.9
2021	11,786.5	2031	12,566.0
2022	11,881.7	2032	12,624.4
2023	11,977.8	2033	12,683.1
2024	12,074.6	2034	12,742.0
2025	12,148.8	2035	12,776.6

Source: elaborated by JET based on INS data

In September 2014, INS released results of the general population and housing census of 2014. According to the results, population of Tunisia in 2014 was 10,982,754. Comparing the actual number with the estimate based on 2004 Census, which is 11,036.7 thousand for 2014, the difference is around 54 thousands, which corresponds to 0.5% of the actual figure. With this small difference, JET deems

that the INS's estimates based on 2004 Census can be applied as estimates for the socio-economic framework of the planning.

(2) Population of the Southern Region

For population forecast in the Southern Region, the Project consulted with INS as the population by governorate/delegation after 2025 based on the results of 2004 Census has not been estimated. With an assumption that the population of the Southern Region would increase by 0.51% per annum after 2025 in all governorates and delegations, the populations of the region and its governorates/delegations were estimated as shown in Table 1.2-3.

Table 1.2-3 Forecasted population for the South and its governorates (unit: thousand)

	2015	2025	2035
Tunisia	11,147.1	12,148.8	12,776.6
South	1,648.8	1,795.0	1,887.8
Gabès	383.7	413.8	435.2
Médenine	486.7	529.2	556.6
Tataouine	154.0	165.4	173.9
Gafsa	355.3	390.3	410.4
Tozeur	111.2	121.3	127.5
Kébili	157.9	175.1	184.1

Source: elaborated by JET with the consultation of INS

Population of the Southern Region in 2014, according to 2014 Census, was 1,605,477, which was somehow 2.6% lower than the population estimated based the results of 2004 Census. Though it would be better to wait and apply population estimated by INS based on the results of 2014 Census as the socio-economic framework of the planning, JET has simply estimated the populations of the Southern Region, and its governorates/delegations, as shown in Table 1.2-4, with the following processes and assumptions, as JET has to conduct the planning before INS estimates the population with the 2014 census results:

- a) Based on the trends of the population growth during the periods between the two censuses, i.e., 1994-2004 and 2004-2014, the average population growth rate for 2011-2015 is estimated.
- b) For 2036, the populations of all governorates/delegations are assumed to increase at the same population growth rate (0.31%) of Tunisia. Though the population in some delegations has decreased with a substantial negative growth rate recently, JET assumes that populations of those delegations after 2035 will grow at the same growth rate as population outflow from those delegations will stop because of concentrated efforts for promotion of the productive activities proposed by the Project for the delegations and the people will have job opportunities in the delegations or at locations within commuting distances from the delegations.
- c) Average population growth rates for 2015-2020, 2020-2025, 2025-2030 and 2030-2035 in each delegation are estimated by linear interpolation.

Table 1.2-4 Estimated population of the Southern Region

(Unit: thousand persons)

State/Region/ Governorate/ Delegation	Actual					Estimate									
	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population
	1994	94-04	2004	04-14	2014	11-15	2015	16-20	2020	21-25	2025	26-30	2030	31-35	2035
Tunisia	8,785.7	1.21%	9,910.9	1.03%	10,982.8	---	11,147.1	0.96%	11,692.0	0.77%	12,148.8	0.58%	12,507.9	0.43%	12,776.6
Southern Region	1,362.1	0.85%	1,483.1	0.80%	1,605.5	0.77%	1,617.8	0.68%	1,673.3	0.59%	1,723.0	0.49%	1,766.0	0.40%	1,801.7
Gabès	311.7	0.95%	342.6	0.89%	374.3	0.86%	377.5	0.75%	391.8	0.64%	404.5	0.53%	415.3	0.42%	424.0
Gabès Médina	90.2	1.89%	47.1	-0.07%	46.7	-1.05%	46.2	-0.85%	44.3	-0.60%	43.0	-0.32%	42.3	-0.01%	42.3
Gabès Ouest	27.0	0.49%	28.4	1.13%	31.8	1.45%	32.2	1.15%	34.1	0.90%	35.7	0.68%	36.9	0.49%	37.8
Gabès Sud	n.a.	1.89%	61.7	1.89%	74.4	1.89%	75.8	1.50%	81.7	1.16%	86.5	0.86%	90.3	0.58%	92.9
Ghanouch	19.2	1.66%	22.7	2.15%	28.1	2.39%	28.7	1.90%	31.5	1.46%	33.9	1.06%	35.7	0.68%	37.0
El Métouia	23.5	0.97%	25.9	0.75%	27.9	0.65%	28.0	0.50%	28.8	0.42%	29.4	0.36%	29.9	0.33%	30.4
Menzel El Habib	11.7	-0.22%	11.5	-1.22%	10.1	-1.73%	10.0	-1.39%	9.3	-1.01%	8.8	-0.59%	8.6	-0.15%	8.5
El Hamma	58.9	0.58%	62.4	1.65%	73.5	2.19%	75.1	1.74%	81.8	1.34%	87.5	0.98%	91.8	0.64%	94.8
Matmata	6.8	-1.60%	5.8	-2.57%	4.4	-3.06%	4.3	-2.46%	3.8	-1.81%	3.5	-1.12%	3.3	-0.41%	3.2
Nouvelle Matmata	17.1	-0.67%	16.0	-1.15%	14.2	-1.39%	14.0	-1.12%	13.2	-0.80%	12.7	-0.45%	12.4	-0.08%	12.4
Mareth	57.3	0.68%	61.3	0.29%	63.1	0.09%	63.1	0.06%	63.3	0.08%	63.6	0.14%	64.0	0.22%	64.7
Médenine	386.2	1.14%	432.5	1.04%	479.5	0.99%	484.2	0.85%	505.2	0.72%	523.5	0.58%	538.9	0.44%	550.9
Médenine Nord	39.3	2.03%	48.1	1.31%	54.8	0.94%	55.3	0.81%	57.6	0.67%	59.5	0.54%	61.1	0.42%	62.4
Médenine Sud	42.4	1.26%	48.1	1.29%	54.6	1.30%	55.4	1.09%	58.4	0.88%	61.1	0.69%	63.2	0.49%	64.8
Beni Khedech	30.7	-0.70%	28.6	-0.99%	25.9	-1.13%	25.6	-0.85%	24.5	-0.57%	23.8	-0.29%	23.5	0.01%	23.5
Ben Guerdane	63.9	1.04%	70.9	1.20%	79.9	1.28%	80.9	1.08%	85.4	0.87%	89.2	0.68%	92.3	0.49%	94.6
Zarzis	70.9	0.37%	73.5	0.25%	75.4	0.19%	75.5	0.20%	76.3	0.21%	77.1	0.24%	78.0	0.27%	79.1
Djerba Houmet Souk	53.3	1.98%	64.9	1.58%	75.9	1.37%	76.9	1.15%	81.5	0.93%	85.3	0.71%	88.4	0.51%	90.7
Djerba Midoun	38.6	2.71%	50.5	2.33%	63.5	2.14%	64.9	1.77%	70.8	1.39%	75.9	1.02%	79.8	0.66%	82.5
Djerba Ajim	22.2	0.86%	24.2	0.05%	24.3	-0.35%	24.2	-0.23%	23.9	-0.11%	23.8	0.03%	23.8	0.16%	24.0
Sidi Makhoulf	24.7	-0.41%	23.7	0.61%	25.2	1.11%	25.5	0.94%	26.7	0.77%	27.8	0.61%	28.6	0.46%	29.3
Tataouine	135.7	0.56%	143.5	0.41%	149.5	0.33%	149.9	0.32%	152.4	0.32%	154.8	0.32%	157.3	0.31%	159.8
Tataouine Nord	47.5	1.36%	54.4	1.23%	61.4	1.16%	62.1	0.97%	65.2	0.79%	67.8	0.62%	70.0	0.46%	71.6
Tataouine Sud	32.8	0.30%	33.8	0.16%	34.3	0.10%	34.4	0.12%	34.6	0.15%	34.8	0.19%	35.2	0.25%	35.6
Smâr	12.2	1.25%	13.8	0.68%	14.8	0.39%	14.8	0.35%	15.1	0.32%	15.4	0.31%	15.6	0.31%	15.8
Bir Lahmar	9.3	-0.08%	9.3	-0.91%	8.5	-1.32%	8.3	-1.02%	7.9	-0.70%	7.7	-0.37%	7.5	-0.04%	7.5
Ghomrassen	20.8	-1.23%	18.3	-1.38%	16.0	-1.45%	15.7	-1.12%	14.9	-0.78%	14.3	-0.43%	14.0	-0.06%	13.9
Dhehiba	3.7	0.70%	4.0	0.79%	4.3	0.83%	4.3	0.70%	4.5	0.59%	4.6	0.49%	4.7	0.40%	4.8
Remada	9.4	0.56%	10.0	0.19%	10.2	0.01%	10.2	0.05%	10.2	0.10%	10.3	0.16%	10.3	0.23%	10.5

(Unit: thousand persons)

State/Region/ Governorate/ Delegation	Actual					Estimate									
	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population	Growth	Population
	1994	94-04	2004	04-14	2014	11-15	2015	16-20	2020	21-25	2025	26-30	2030	31-35	2035
Gafsa	307.5	0.51%	323.7	0.41%	337.3	0.36%	338.6	0.35%	344.5	0.34%	350.5	0.33%	356.3	0.32%	362.0
Gafsa Nord	8.6	0.90%	9.4	0.64%	10.0	0.50%	10.1	0.44%	10.3	0.38%	10.5	0.35%	10.7	0.33%	10.9
Sidi Aïch	8.0	0.35%	8.3	1.97%	10.1	2.78%	10.4	2.26%	11.6	1.75%	12.6	1.26%	13.5	0.78%	14.0
El Ksar	28.5	1.24%	32.2	1.26%	36.5	1.27%	36.9	1.05%	38.9	0.85%	40.6	0.66%	42.0	0.48%	43.0
Gafsa Sud	76.0	1.78%	90.7	1.09%	101.1	0.75%	101.9	0.63%	105.2	0.53%	108.0	0.45%	110.4	0.37%	112.5
Oum El Araïes	32.1	-0.10%	31.7	-1.60%	27.0	-2.35%	26.4	-1.84%	24.0	-1.32%	22.5	-0.79%	21.6	-0.24%	21.4
Redeyef	28.8	-0.30%	27.9	-0.35%	27.0	-0.38%	26.9	-0.27%	26.5	-0.14%	26.3	0.00%	26.3	0.15%	26.5
Métlaoui	40.1	-0.29%	38.9	-0.08%	38.6	0.03%	38.6	0.06%	38.8	0.10%	38.9	0.16%	39.3	0.23%	39.7
M'dhila	16.0	-0.74%	14.8	0.31%	15.3	0.83%	15.4	0.70%	16.0	0.58%	16.5	0.48%	16.9	0.39%	17.2
EL Guetar	21.4	-0.68%	19.9	0.10%	20.1	0.49%	20.2	0.42%	20.7	0.38%	21.1	0.34%	21.4	0.32%	21.8
Belkhir	16.2	-0.63%	15.2	-0.25%	14.8	-0.06%	14.8	-0.01%	14.8	0.05%	14.8	0.13%	14.9	0.21%	15.1
Sned	32.0	0.76%	34.5	0.63%	36.7	0.56%	36.9	0.48%	37.9	0.42%	38.7	0.37%	39.4	0.34%	40.0
Tozeur	89.1	0.91%	97.5	1.02%	107.9	1.07%	109.1	0.92%	114.2	0.76%	118.6	0.61%	122.3	0.46%	125.1
Tozeur	35.6	1.13%	39.9	1.54%	46.4	1.74%	47.2	1.43%	50.7	1.14%	53.7	0.86%	56.0	0.58%	57.7
Degach	25.3	0.50%	26.6	0.71%	28.5	0.81%	28.8	0.70%	29.8	0.59%	30.7	0.49%	31.4	0.40%	32.1
Tameghza	5.5	1.52%	6.4	0.24%	6.5	-0.40%	6.5	-0.28%	6.4	-0.14%	6.4	0.01%	6.4	0.16%	6.4
Nefta	19.2	0.68%	20.5	0.56%	21.7	0.51%	21.8	0.45%	22.3	0.41%	22.8	0.37%	23.2	0.34%	23.6
Hazoua	3.5	1.84%	4.2	1.22%	4.7	0.91%	4.7	0.78%	4.9	0.65%	5.1	0.53%	5.2	0.42%	5.3
Kébili	131.9	0.83%	143.2	0.92%	157.0	0.97%	158.5	0.84%	165.2	0.70%	171.1	0.57%	176.1	0.44%	180.0
Kébili Sud	26.2	0.69%	28.0	0.83%	30.4	0.90%	30.7	0.79%	32.0	0.67%	33.1	0.55%	34.0	0.43%	34.7
Kébili Nord	27.8	0.57%	29.4	0.79%	31.9	0.91%	32.1	0.80%	33.5	0.68%	34.6	0.55%	35.6	0.43%	36.3
Souk El Ahed	27.3	-0.22%	26.7	0.42%	27.9	0.73%	28.1	0.66%	29.0	0.57%	29.9	0.48%	30.6	0.40%	31.2
Douz Nord	38.2	1.11%	25.5	1.15%	28.6	1.16%	29.0	1.01%	30.4	0.83%	31.7	0.66%	32.8	0.48%	33.6
Douz Sud	n.a.	1.11%	17.2	0.77%	18.6	0.61%	18.7	0.56%	19.2	0.50%	19.7	0.43%	20.1	0.37%	20.5
Faouar	12.4	2.80%	16.3	1.87%	19.6	1.41%	19.9	1.20%	21.1	0.98%	22.2	0.75%	23.0	0.53%	23.6

Source: elaborated by JET based on with the results of 2014 Census and other data provided by ODS

In some delegations, population has decreased with a considerable negative growth rate. Except some urban areas, where the population decrease may show just saturation of dwelling or population ‘hollowing-out’ (so called ‘donut phenomenon’, with which people in leave an urban centre and live in a suburb). , substantial population outflow might have occurred in those areas probably because of having fewer employment opportunities due to unfavourable economic conditions. For those delegations, specific measures should be taken to stop the outflow. Besides, the population decrease in these areas does not reach such level for many villages to disappear and for future promotions of productive sectors to be impossible.

(3) Economically active persons of the Southern Region

Based on the results of the 2004 Census, numbers of economically active persons (EAP) of the Southern Region and the six governorates in the region were estimated by INS as shown below.

Table 1.2-5 Estimated economically active persons based on 2004 Census

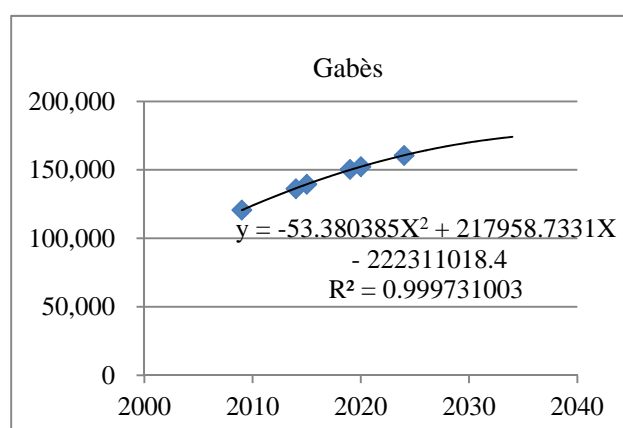
(Unit: thousand persons)

	Southern Region	Gabès	Médenine	Tataouine	Gafsa	Tozeur	Kébili
2004	429.3	105.6	124.4	34.3	91.0	31.6	42.4
2009	489.0	120.6	141.1	39.1	102.7	35.9	49.6
2014	550.1	136.2	157.0	44.7	114.9	40.1	57.2
2019	602.8	150.3	169.9	49.7	125.5	43.8	63.5
2024	638.9	160.5	178.6	53.0	132.4	46.6	67.7

Source: Le Sud Tunisien en chiffres 2013

EAP of each of the six governorates in 2025, 2030 and 2035 are estimated through polynomial approximation with the above-mentioned modified population for 2004, 2009, 2014, 2019 and 2024 estimated by JET. The EAP of the Southern Region is estimated just as a total of the EAP of the six governorates. The following coefficients of a , b and c are calculated with high correlation coefficients (R^2).

$$y = a x^2 + b x + c \text{ (where, } y: \text{ economically active population in year } x, x: \text{ year)}$$



Source: elaborated by JET

Figure 1.2-1 Polynomial approximation of economically active population (example of Gabès)

Table 1.2-6 Computed coefficients for estimation of economically active population

	<i>a</i>	<i>b</i>	<i>c</i> (thousand)	<i>R</i> ²
Gabès	- 53.38038500	217,958.7331	- 222,311,018.40	0.999731003
Médenine	- 71.87009625	292,362.9583	- 297,142,612.70	0.999904276
Tataouine	- 23.17000000	94,378.7900	- 96,051,972.19	0.999494066
Gafsa	- 52.54038500	213,892.5731	- 217,550,334.70	0.999539694
Tozeur	- 15.28000000	62,339.2400	- 63,532,372.48	0.999909886
Kébili	- 34.17009625	139,021.6583	- 141,331,665.70	0.999827550

Source: elaborated by JET

With the modification of the population projection as described in Section 2.1.2 of this report, estimates of the EAP are also revised, assuming the proportion of the EAP to the total population in the same year in the same governorate is the same. The ratios of the EAP to the population are assumed same as that of 2024.

EAP of the Southern Region and the six governorates of the region for the target period of the development strategies and plans are estimated as shown below. EAP in the Southern Region is estimated to grow by 1.22 times during the period of 2015-2035. In this period, EAP of the Southern Region will increase by 119 thousand.

Table 1.2-7 Number of economically active persons of the Southern Region and its six governorate
(Unit: thousand persons)

year	Southern Region	Gabès	Médenine	Tataouine	Gafsa	Tozeur	Kébili
2015	551.7	137.1	159.0	44.7	112.1	40.1	58.7
2020	588.2	147.2	169.0	47.5	117.6	43.1	63.8
2025	617.6	155.9	176.5	49.6	122.2	45.5	67.8
2030	647.9	165.2	182.8	52.8	127.9	47.8	71.4
2035	670.5	172.9	186.5	55.5	132.1	49.6	74.0
(2035–2015)	118.8	35.8	27.5	10.8	20.0	9.4	15.3
(2035/2015)	1.22	1.26	1.17	1.24	1.18	1.24	1.26

Source: elaborated by JET

1.2.2 Economy of Tunisia

(1) Economic growth and unemployment rate of Tunisia

The paper titled « Quelles Perspectives de Croissance a Long Terme ? » or “What Perspectives of Growth in Long-Term?” issued by Tunisian Institute of Strategic Studies (ITES: Institut Tunisien des Etudes Stratégiques) in September 2014, estimates the growth rate of Tunisia’s GDP (gross domestic product), which is composed of the three growth elements, i.e., input of labour forces, capital stock and total factor productivity (unmeasurable elements other than labour forces and capital factors), as shown in the following formula:

$$y_t = a_t + \alpha l_t + (1 - \alpha) k_t$$

where, y_t is the growth rate of GDP, a_t is the growth rate of total factor productivity (PGF: la productivité globale des facteurs), l_t is the growth rate of the employment, k_t is the growth rate of the capital stock, and α is the average share of income accruing to labour input, which is estimated at 0.4.

The paper analyses records of the growth since 1983 and summarises as follows:

Table 1.2-8 Evolution of the determinants of the growth

	GDP	Capital	Work	PGF	Population aged 15 years-old or more	Inflation
1983-1990	3.5%	3.2%	2.7%	0.5%	2.9%	7.4%
1991-2000	4.9%	2.2%	2.7%	2.5%	3.0%	4.5%
2001-2010	4.5%	3.7%	2.5%	1.2%	1.9%	3.4%

Source: Quelles Perspectives de Croissance a Long Terme, ITES

The paper estimates future economic growth for three cases, i.e., rapid, moderate and slow growth cases. With an assumption that long term growth of the capital stock will be equal the potential growth rate, economic growth is estimated with the following formula:

$$y^p = a / \alpha + l^p$$

where, y^p is the potential growth rate of GDP, a is the potential growth rate of PGF and l^p is the potential growth rate of the employment factor.

The employment factor is projected with estimation of the following three elements as follows:

$$l^p = pop^p + act^p + (1 - \mu^p)$$

where, pop^p is the potential growth rate of population aged 15 years-old or more, act^p is the potential growth rate of active persons and $(1 - \mu^p)$ is the potential growth rate of the employment.

Table 1.2-9 Estimated growth rate of employment factor

Factor	pop^p : Growth in population aged 15 years-old or more (%)			act^p : Growth in rate of active persons (%)			$(1 - \mu^p)$: Growth in employment rate (%)			l^p : Growth rate of the employment factor (%)		
	rapid	moderate	slow	Rapid	moderate	slow	rapid	moderate	slow	rapid	moderate	slow
Case												
1983-1990	2.9			- 0.4			0.2			2.7		
1991-2000	3.0			- 0.2			0.0			2.7		
2001-2010	1.9			0.6			0.1			2.5		
2011-2020	1.7	1.3	1.1	1.0	1.0	0.8	0.2	0.2	0.1	2.9	2.5	1.8
2021-2030	1.3	1.1	0.9	1.0	0.8	0.6	0.3	0.2	0.1	2.6	2.1	1.6
2031-2040	1.0	0.9	0.7	1.0	0.6	0.5	0.5	0.3	0.1	2.5	1.8	1.3

Source: Quelles Perspectives de Croissance a Long Terme, ITES

As for PGF, the paper sets the following values for the three cases of the growth.

- Rapid growth case: 4% by 2030, reaching to the average level recorded in Asian countries
- Moderate growth case: 3% by 2030, middle of rapid and slow growth cases
- Slow growth case: 2%, remaining at the level recorded during the period of 2001-2010

The paper concludes that the potential GDP growth can be estimated as shown in Table 1.2-10.

Table 1.2-10 Estimated GDP growth

Factor	Growth of the PGF (%)			Growth of the employment factor (%)			Growth rate of the potential production (%)		
	rapid	moderate	slow	rapid	moderate	slow	rapid	moderate	slow
Case									
1983-1990	0.8			2.7			3.5		
1991-2000	2.2			2.7			4.9		
2001-2010	2.0			2.5			4.5		
2011-2020	2.6	2.2	2.0	2.9	2.5	1.8	5.5	4.7	3.8
2021-2030	3.4	2.5	2.0	2.6	2.1	1.6	6.0	4.6	3.6
2031-2040	4.0	3.0	2.0	2.4	1.8	1.3	6.4	4.8	3.3

Source: Quelles Perspectives de Croissance a Long Terme, ITES

JET sets economic growth and unemployment estimated by the paper for the moderate case as bases of the socio-economic framework because ITES estimated the economic growth and unemployment rate with careful analysis of the past records and because Economist Intelligence Unit, a world-renowned research institute, estimates similar figure of economic growth of Tunisia as 4.1% for the period of 2013-2020 and 4.9% for the period of 2021-2030.

It should be noted that JET applies the above-mentioned estimates as socio-economic framework for the planning of the Southern Region as an external conditions for the region, and that the figures do not show any estimates of targets for economic development of Tunisia as well as the Southern Region.

(2) Implication of the estimates on the planning for the Southern Region

After estimation of future GDP growth rate and unemployment rate of Tunisia, other economic parameters, such as gross capital formation, foreign direct investment and foreign exchange rate of Tunisian Dinar were analysed considering effects of the two parameters. Then, implications of these parameters to the economic development of the Southern Region are examined through analyses of how changes of these parameters affect the economy.

(a) Growth of GDP and GDP per capita

With the growth rate estimated above and the population projection shown in Section 1.2.1 of this report, indices of GDP and GDP per capita of Tunisia are calculated as shown in Table 1.2-11. In moderate growth case, GDP will grow by 1.7 times and 2.7 times by 2025 and 2035, respectively, while GDP per capita will grow by 1.5 times and 2.3 times by 2025 and 2035, respectively.

Table 1.2-11 Indices of GDP and GDP per capita of Tunisia

Indicator	Growth case	2013	2015	2020	2025	2030	2035
GDP	Rapid growth	1.00	1.11	1.45	1.95	2.61	3.55
	Moderate growth		1.10	1.38	1.73	2.16	2.73
	Slow growth		1.08	1.30	1.55	1.85	2.18
GDP per capita	Rapid growth	1.00	1.08	1.34	1.73	2.25	3.00
	Moderate growth		1.06	1.27	1.53	1.87	2.31
	Slow growth		1.04	1.20	1.38	1.59	1.84

Source: elaborated by JET

Generally, GDP per capita grows in parallel with the wage level. As GDP per capita of Tunisia will reach 2.31 times of the current amount in 2035 in real term, the wage level in Tunisia will also rise substantially by 2035. Tunisia as well as the Southern Region has to increase export, competing with

the high wage level against countries with less GDP per capita and lower wage level. In principle, entrepreneurs select locations of their investment where enterprises may procure cheaper labour force of similar quality.

Tunisia and the Southern Region have to compete for attraction of enterprises with those countries with raised wage level. To be competitive with those countries, it is necessary to raise productivity, increasing i) the growth rate capital per hour of labour, ii) the growth rate of human capital and iii) the pace of technological advance. Until now these increases seems to have occurred mainly in Greater Tunis, North-east and Central-east Regions. To catch up with more advanced regions of Tunisia, it is inevitable to make these increases faster in the Southern Region than the rest of Tunisia. More intensive promotion of human resource development and attraction of investment are required for the Southern Region.

(b) Unemployment rate

Unemployment rate of Tunisia in 2013 was 15.3%. Applying the above estimates, future unemployment rates in Tunisia are estimated as shown in Table 1.2-12. As unemployment rate would be a target indicator with which the values of Tunisia and those of the Southern Region will be compared with each other to monitor the regional disparity, the target values of the Southern Regions for 2025 or 2035 should be lower than or near the values of Tunisia to reduce the gaps between the Southern Region and the currently advanced regions of Tunisia. The target values are set in Chapter 5 of this report.

Table 1.2-12 Estimated unemployment rates in Tunisia

Indicator	Growth case	2013	2015	2020	2025	2030	2035
Unemployment rate	Rapid growth	15.3%	14.9%	13.4%	11.9%	10.4%	7.9%
	Moderate growth		14.9%	13.9%	12.9%	11.9%	10.4%
	Slow growth		15.1%	14.6%	14.1%	13.6%	13.1%

Source: elaborated by JET

According to the latest available data, the unemployment rate in the Southern Region was 25.6% as of 2011, while that of Tunisia in the same year was 18.9%, nearly 7% lower than that of the Southern Region. The difference in unemployment rates was relatively higher for the graduates of higher (superior) education, which was 43.9% for the Southern Region in 2011, but 29.1% for Tunisia in the same year.

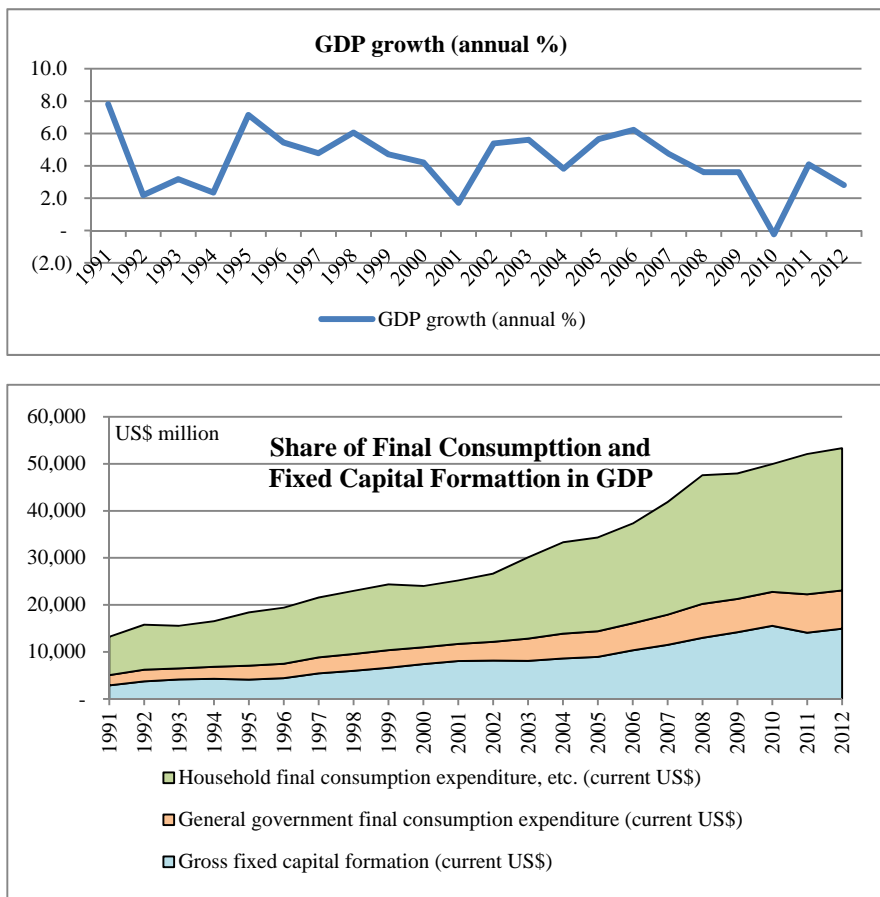
To reduce the difference in employment, especially that of higher education graduates, it would be necessary to upgrade the productive sector so that the sectors will require highly educated personnel as managers and experts. In order to upgrade the productive sector of the Southern Region and to catch up with advanced regions of Tunisia, research and development as well as promotion of investment is highly required.

(c) Gross capital formation

As described Section 1.2.2 (1) of this report, the growth of capital stock, i.e., gross fixed capital formation, is a source of GDP growth in a long term, and there a loose relation between GDP growth and change in gross fixed capital formation has been identified as shown in Figure 1.2-2.

To achieve upgraded productive sector in the Southern Region, the capital formation, especially, private

investment is required. For encouraging private investment, growth in capital formation at national level will be a favourable tailwind. Domestic investor, however, generally invest in their own regions and domestic private investment from other regions has been quite limited. Improving business environment, such as infrastructure development, and providing incentives would be essential for the Southern Region.

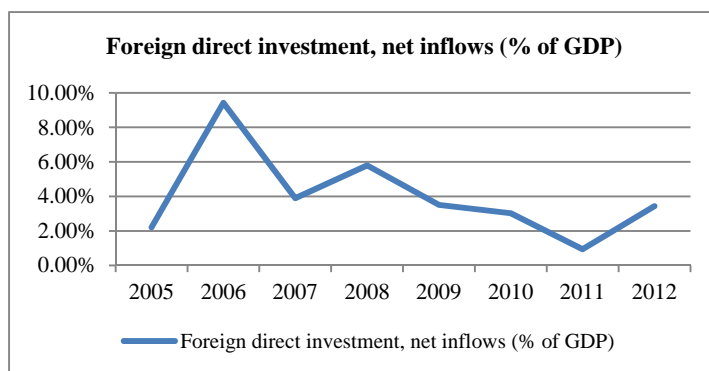


Source: elaborated by JET based on the World Bank databank

Figure 1.2-2 Evolution of GDP growth and gross fixed capital formation

(d) Foreign direct investment

A relation between GDP growth and inflow of foreign direct investment (FDI) has been identified. However, it is not clear whether FDI inflow and GDP growth have relation with each other or if both are just commonly affected by the growth of the world or European economy, the social/political conditions of Tunisia, or both. Actually, FDI inflow to the Southern Region seems only to be contributing to the employment of workers and not to introducing new technology or innovating the industries of the Southern Region. The factories built by FDI are operated only as a part of the supply chain within large international manufacturers. It is feared that they may leave the Southern Region once they found other places where they can procure cheaper labour force with the same or better quality.



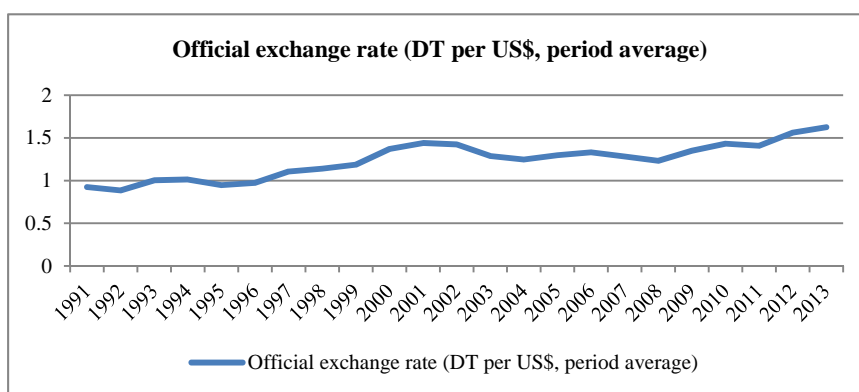
Source: elaborated by JET based on the World Bank databank

Figure 1.2-3 Change in percentage of foreign direct investment to GDP

A working paper titled “How does Foreign Direct Investment Promote Economic Growth?” issued by National Bureau of Economic Research of the United States in 2006 states that FDIs generally do not simply enhance the productivity of host countries and promote economic development, despite a widespread belief among policymakers of developing countries that FDIs do so. The paper concludes that when financial markets are developed enough, the host country benefits from the backward linkages between the foreign and domestic firms with positive spillovers to the rest of the economy of the country through augmenting technological innovation. The paper also indicates that other local conditions such as market structure and human capital are also important to generate a positive effect of FDIs on the economic growth of the country. When the relevant authorities of the Southern Region attract FDIs, these should be carefully taken into consideration. With the development of financial markets and human capital in the Southern Region, it is necessary to enhance the links of local industries with the foreign investors or multinational enterprises to take full advantage of the FDIs.

(e) Foreign exchange rate

There is little or no relation between economic growth and effective exchange rate with international currency as Figure 1.2-4 shows as an example. However, as the exchange rates will have important implication for the economic development of the Southern Region is analysed below.



Source: elaborated by JET based on the World Bank databank

Figure 1.2-4 Changes in exchange rate of Tunisian Dinar to the US\$

When a productive sector in the Southern Region imports some intermediate goods or service, including those for tourists’ consumption, costs of the goods or services in Tunisian dinar (DT) are high in case the value of DT is low compared to other currencies, such as US\$ or Euro. Besides, when some values are added by productive sector in the Southern Region and exported, the value added in the Southern

Region would be low to the importers or foreign consumers. Therefore, generally, exports are encouraged by low exchange rate of the local currency.

As Tunisian market is small with population of only around ten million, exporting of goods and services should be a pillar of the economic development of Tunisia as well as the Southern Region. Implications of changes in the exchange rate to the economic development of the Southern Region are to be analysed based on its effects on the export. As shown above, weak DT will be favourable for export in general. However, promoted expanded exports will increase the demand of DT in the exchange markets and raise the value of DT. It is necessary, sooner or later, to enhance the competitiveness by all means, with which Southern Region can export its final products even in the circumstances of high value of DT. The DT could become stronger because of relatively high economic growth rate (as high as 4.6% – 4,8%) projected for the period from 2015 to 2025, and this was observed during 1995 – 96 and 2002 – 2007 when the DT was strong and the growth rate remained higher than 4%. The development vision described in Section 1.1.4 of this report has been set with prospects of possible high value of DT.

CHAPTER 2 DEVELOPMENT SCENARIO AND SPACIAL

DEVELOPMENT PLAN

2.1 Development scenario

2.1.1 Current development status of the Southern Region and required paradigm shift

(1) Conventional development pattern of the Southern Region

Conventional development pattern of the Southern Region could be summarised as follows:

- * Agricultural development with expansion of irrigation
- * Development of exploitive fishery
- * Development of phosphate mining and production of phosphate acid by a national company
- * Development of mining of limestone, marble stones, gypsum, etc.
- * Promotion of agro-fishery processing, being generally limited to intermediate products and export of the products
- * Promotion of mass beach tourism
- * Promotion of processing and export of mining products, being generally limited to intermediate products
- * Attraction of foreign direct investment/enterprises for labour intensive manufacturing

In the Southern Region generally, primary productive sectors, such as agriculture (with major products of dates, olive, etc.), livestock breeding, fishery, and mining (represented by phosphate, limestone, marble stones, gypsum, etc.), which produce raw materials, have been promoted. Processing/manufacturing sectors have been limited to intermediate goods. Another major productive sector developed in the Region is tourism with intensive development of mass tourism along the coastal line.

(2) Issues of the conventional development

With the above-mentioned development pattern, the following issues have arisen:

- Low value added to the local resources and primary products of the Region
- Limited employment opportunities, especially for graduates of higher education, due to low demand for managers and experts
- Over-exploitation of groundwater, causing water table depletion and water quality deterioration
- Serious pollution by phosphate-chemical industry, causing contamination of Gabès Bay
- Large seasonal fluctuation in employment due to limited variety of agricultural, food processing, and tourism products
- Weak linkage between attracted foreign enterprises and local industries and little involvement of local companies in the supply chains of the foreign enterprises

Due to the above issues, unemployment rate in the Southern Region is substantially higher than the Tunisian average, especially for graduates of higher education as shown in Section 1.2.2 of this report.

This has resulted in disparity in per capita household income and consumption between the Southern Region and the Tunisian average as well as that between the coastal and inland areas within the Southern Region. The disparities has consequently induced population outflow from the Southern Region to other regions of Tunisia, such as to Greater Tunis Area, as well as from the inland to coastal areas in the Region.

(3) Required shift of development paradigm

To overcome the issues the Southern Region has to be developed under a new paradigm described below. The development vision proposed in Section 1.1.4 shows the status of the future productive sector to be achieved with the following concepts:

- Optimal use of limited resources
- Fishery resource conservation and shift to aquaculture
- Strict pollution control and dissemination of information on pollution control to the world
- Promotion of agro-fishery processing up to final products and exporting of the products
- Promotion of upgraded manufacturing and well-designed final products and its export
- Promotion of involvement of the local industries in supply chains of the multinational enterprises
- Conservation of tourism resources, tourist destination development and upgrading the services
- Establishment of Southern Region brand

2.1.2 Setting alternative development scenarios

Alternative regional development scenarios, i.e., possible sets of approaches to achieve the development goal described in Section 1.1.3 and the development vision explained in Section 1.1.4 of this report are set, and they are compared and the best set of approaches is selected as the development scenario. To achieve the development goal and the vision, it is required to restructure the economy toward the above-mentioned paradigm shift. For realisation of the shift, it is necessary i) to attract investment, ii) to develop/introduce technology, iii) to enhance financing services and supports, and iv) to develop physical infrastructure. As the restructuring may face difficulties, it should be carefully examined how the necessary activities of i) to iv) can be implemented.

Alternative scenarios are set, with which the development goal and vision will commonly be achieved, with the following choices: a) whether regional development should be promoted through private or public initiative, and b) whether population outflow from less developed areas should be accepted to a certain degree or strictly avoided.

At the early stage of the regional development, under any of alternative scenarios, i) development of basic infrastructure, such as that to support primary production and that to connect primary production areas with respective regional centres, ii) strengthening of existing research and development (R&D) centres, iii) preparation for investment/enterprise attraction, iv) establishing/enhancing financing institutions in all governorates, and v) strengthening guidance for management improvement in order to establish solid base for future development. Three alternative scenarios are set and compared as follows with respective approaches for middle- to long-term development to achieve the development goal.

Table 2.1-1 Alternative regional development scenarios

Scenario 1: Private initiative/cluster development	Scenario 2: Private initiative/concentrated development	Scenario 3: Public initiative/cluster development
<p><i>Approach:</i> With ingenuity of local entrepreneurs, productive sector clusters will be spontaneously formed. This approach pursues market principles.</p> <p><i>Spatial development:</i> Clusters will be developed evenly over the region and all areas are developed gradually.</p> <p><i>Intervention of public administration:</i> Public administration should back up the private sector through supports and infrastructure development for entrepreneurs to collect and utilise information regarding technology, demands in international markets, partners, and transport.</p> <p><i>Infrastructure development:</i> Public administration has to develop/expand R&D centres and platforms for information exchanges for every regional centre, establish/enhance the national and global information and transport networks in the Southern Region as well as develop transportation networks among regional centres.</p>	<p><i>Approach:</i> Through attraction of large-scale private investment, productive sector development will be concentrated. This approach pursues economy of scale.</p> <p><i>Spatial development:</i> Development will initially be concentrated in the coastal areas for export promotion, and gradually extended to the inland areas.</p> <p><i>Intervention of public administration:</i> Public administration has to improve business environment with incentives and physical infrastructure development in the coastal areas, and then promote development through supporting productive sectors in the inland areas.</p> <p><i>Infrastructure development:</i> Public administration has to develop major infrastructure (ports, railways, highways, etc.) in the coastal areas at early stage, and later extend the transportation infrastructure to the inland areas according to the development of the inland areas.</p>	<p><i>Approach:</i> According to plans formulated with the public initiative, inter-sectoral and inter-governorate integration will be realised through cluster development.</p> <p><i>Spatial development:</i> Clusters will be developed and gradually expanded over the Region.</p> <p><i>Intervention of public administration:</i> Public administration has to plan, supervise, monitor and follow-up the cluster development as well as develop infrastructure, improve business environment, organise/assist entrepreneur groups, promote marketing and R&D through public-private- academic collaboration.</p> <p><i>Infrastructure development:</i> Public administration has to develop infrastructure to promote cluster formation and expansion according to the features of the clusters, and develop transport infrastructure to connect clusters with international gateways.</p>

Source: elaborated by JICA Expert Team (JET)

2.1.3 Evaluation of alternative regional development scenarios

The economic, social and environmental aspects of three alternative scenarios are evaluated. Valuations with positive results are highlighted in orange.

Table 2.1-2 Evaluation of alternative regional development scenarios

Aspects		Scenario 1: Private initiative/ cluster development	Scenario 2: Private initiative/ concentrated development	Scenario 3: public initiative/cluster development
Economic	Infrastructure development efficiency	Comparatively low efficiency	Comparatively high efficiency	Comparatively high efficiency
	Reason for the evaluation	Infrastructure has to be developed all over the Southern Region under Scenario 1 to support spontaneous cluster development. The efficiency of the infrastructure development will therefore be low in Scenario 1. The infrastructure development under Scenario 2 will be concentrated because of the condensed cluster development in the coastal areas. The efficiency in infrastructure development will therefore be comparatively high in Scenario 2. Though cluster development is to be located over the Southern Region under Scenario 3, the infrastructure will be developed efficiently as the specifications for infrastructure development can be well coordinated according to the cluster development plans.		
	Economic effects	Slow economic growth at the early stage and gradual development with cluster development; Possible growth after the target period	Fastest economic growth due to concentrated large investment; Possible stagnant growth after the target period	Slow economic growth at the early stage and accelerated development; Possible growth after the target period
	Reason for the evaluation	Under Scenario 1 and Scenario 3, economy of scale will not work and economic growth will be slow at the early stage. In contrast, under Scenario 2, economy of scale will work due to the concentrated cluster development. Economic growth at the early stage will therefore be faster in Scenario 2 than in 1 or 3. Under Scenario 1, economic growth will continue for a long period because various types of industries will emerge, though some industries will fall by the wayside. Possible growth after the target period can be expected under Scenario 3 due to planned cluster development and expansion.		
	Economic risks	Some enterprises to become competitive and others to become unprofitable	Low economic risks Future economic risks	Certain economic effects Possible risks
	Reason of the evaluation	Under Scenario 1, various enterprises will emerge and the some will vanish because of the spontaneous development. There will be lower risks under Scenario 2 due to the comparatively concentrated large-scale enterprises. Besides, there will be risks of resource overexploitation in the future under Scenario 2 due to monotonous large-scale development. Certain economic effects can be expected under Scenario 3, but the risk of miss leading by public administration is anticipated.		
Social	Employment and population outflow	Human resource development and job creation take time; Less population outflow and stable communities in the inland areas	Rapid job creation in the coastal areas; Unbalanced job creation and possible population outflow from the inland areas in the early stage	Balanced job creation and less population outflow; and Stable communities even in the inland areas
	Reason for the evaluation	Under Scenario 1, human resource development and job creation will proceed slowly because of the various kinds of development and slow growth at the early stage. Under Scenario 2, population outflow from the inland areas will occur due to rapid job creation in the coastal areas and delayed employment in the inland areas. With the planned and articulated cluster development, balanced job creation, less population outflow, and stable inland communities will be possible under Scenario 3.		
	Involvement of public administration	Difficulties in infrastructure development all over the region will hinder the activation of the productive sectors of all governorates	Difficulties in implementing measures for the extension of economic effects to the inland areas against economic principles	High capability required for planning, managing and leading the regional development
	Reason for the evaluation	Under Scenario 3, public administration will face difficulties in the infrastructure development to be implemented all over the region under budget constraints. Under Scenario 2, public administration will face difficulty in extending the economic development to the inland areas. For the development under Scenario 3, public administration should have sufficient capacity and capability to plan, manage, and lead the regional development.		

Environmental	Water resources	Water resource allocation among productive sectors and regions to be carefully planned in the inland areas	Requirement for expansion of desalination plants in the coastal areas. Less problems with water resources in the coastal areas	Possible optimal water resource allocation due to planned and coordinated development
	Reason for the evaluation	To cope with spontaneous and scattered cluster development, careful water resources allocation plan and groundwater abstraction control will be required under Scenario 1. Large-scale desalination plants will be required in the coastal areas under Scenario 2. Fewer problems are expected in Scenario 2, given the accumulated experience with the expansion/construction of desalination plants in the areas. Under Scenario 3, water resources can be allocated optimally according to cluster development plans, or cluster development plans can be formulated considering water resource potentials.		
	Pollution control	Careful pollution control measures to be implemented in all clusters over the region	Expected centralised pollution control measures due to concentrated development Possible difficulties in the long-term	Careful pollution control measures to be implemented in all clusters throughout the region Expected thorough pollution control in the long-term
	Reason for the evaluation	As various types of productive sectors spontaneously scatter over the region, careful pollution control will be required in many places corresponding to the productive sector development under Scenario 1. On the contrary, under Scenario 2, as the cluster development is concentrated, more efficient centralised pollution control will be possible. In the long-term under Scenario 2, however, difficulties will arise when the cluster development extends over the region. Under Scenario 3, as the cluster may also be distributed over the Region, careful pollution control in all clusters will be required though more efficient pollution control would be possible compared to Scenario 1 through concentration of similar processing factories as well as active involvement by the public administration.		

Source: elaborated by JET

Each of the alternative scenarios can respectively be evaluated as follows based on the above evaluation.

Scenario 1: This scenario enables even productive sector development and job creation over the Southern Region, but with low infrastructure development efficiency. Economic development and job creation will take time to appear. Moreover, coordination among companies would be difficult for effective water resources allocation and pollution control.

Scenario 2: High value adding can be realised efficiently at earlier stages. However, there would be unbalanced job creation and consequent population outflow, and would be difficult to maintain good social environment.

Scenario 3: Effective high value adding and regionally balanced job creation can be accelerated as results of planned leads by public administration. Moreover, optimal water resources allocation could be realized.

As a result of the evaluation of the alternative scenarios explained above, Scenario 3 is proposed for the development of the Southern Region in order to realise a) balanced, effective and efficient high value adding to the local resources, b) job creation and c) sustainable development over the Region. To realise the development goal and vision under Scenario 3, it would be essential for the public administration to play important roles; for example, for cluster development the administration has to i) strengthen inter-governorate and inter-sectoral coordination, ii) manage limited resources, to monitor international economy, iii) implement necessary countermeasures based on results of the monitoring, and iv) lead, promote and support the private productive sector development.

2.1.4 Selection of the development scenario

In the P/C meetings of the third round, three alternative development scenarios illustrated in Table 2.1-1 were discussed. As a result, Scenario 3 (Public initiative/cluster development) has been selected as the development scenario for the development of the Southern Region for the period 2015-35 (refer to Section 8.3. of Chapter 8 of Part I of this report). It was also agreed that cluster development under

Scenario 3 should proceed with close collaboration between the public and private sectors through participatory approach, in which development strategies, plans and action plans would be discussed with participation of major stakeholders.

2.1.5 Regional development under Scenario 3

(1) Principles of cluster development for the Southern Region

Scenario 3 is an approach to achieve the development vision, i.e., i) higher value-added, ii) more job creation and iii) sustainable development, through strategic cluster development, in which inter-sectoral and inter-governorate integration will be realised. Scenario 3 applies the concept of ‘a cluster’ that is a geographic concentration of interconnected businesses, suppliers, and associated institutions in a particular field introduced and popularized by Michael Porter, a U.S. economist. In clusters, enterprises will be competing as well as cooperating and complementing each other.

Enterprises and institutions related to specific products have to agglomerate in areas of the Southern Region to strengthen their competitiveness. For effective and efficient cluster formation in the Southern Region, where the private sector is weak, intervention of the public administration is necessary to support and activate private enterprises with long-term strategies for cluster development. The following three principles are set for cluster development of the Southern Region.

- 1) Enterprises and relevant institutes related to specific products are agglomerate in areas of the Southern Region for adding higher value through collaboration, competition and synergy effects.
- 2) With long-term strategies, public administration will be involved in and lead the cluster development.
- 3) Cluster development will be promoted through collaboration between the public and private sector with participatory approaches where strategies, plans and action plans will be continuously examined and discussed with participation of various stakeholders.

(2) Policies for cluster development

To realise cluster development effectively and efficiently in the Southern Region, phased development will be applied with clear definition of stages of the development. Five stages of development, namely “preparation stage”, “formation stage”, “execution stage”, “expansion stage” and “development stage” are set for the cluster development. Action plans will be implemented according to the stages of the development. Implementation plans for respective cluster development will be formulated in detail showing who, what, when, where and how the actions for cluster development will be carried out.

Cluster committees will be established for planning, coordination, and monitoring and evaluation (M/E) of cluster development. The committee members will meet as frequent as six times a year. The committees will preferably have some operational functions, such as market researches, promotion and branding actions with the supports of the public organisations in charge of the administration of the cluster development in addition to deliberative functions on cluster development. Policies on the cluster development by development stage are shown in Table 2.1-3.

Table 2.1-3 Cluster development policies by development stage

Development stage	Period*	Implementation policy
Preparation stage	2016 – first half of 2018	<ul style="list-style-type: none"> * Research and development required for cluster formation * Legal, institutional and organisational arrangement for rigid basis of cluster formation * Formulation of implementation plans by products for cluster formation
Formation stage	second half of 2018 – 2020	<ul style="list-style-type: none"> * Accumulation of resources (human and technology), encouraging technology transfer, improvement in training, and improvement of business environment for upgrading quality of products and increasing productivity of the productive sectors * Fostering partnership between the public and private sectors
Execution stage	2021 – first half of 2023	<ul style="list-style-type: none"> * Encouraging investment * Implementation of activities for higher value-added products, such as introducing innovation, product development, etc. * Forming nuclei (agglomeration of enterprises, R&D institutes, academic institute, etc.) of clusters * Implementation of sales promotion, branding
Expansion stage	second half of 2023 – 2025	<ul style="list-style-type: none"> * Further attraction of investment and enterprises mainly from outside of the region * Further technology development including peripheral technology * Enhancing nuclei and developing networks among nuclei and with related industries. * Further sales promotion, branding
Development stage	2026 onward	<ul style="list-style-type: none"> * Establishing high competitiveness in the global market * Self-sustained activities for further innovation, development of new products

Note: * Period may vary depending on the productive sector and the product

Source: JET

(3) Phased development in respective productive sectors

Phased development in respective productive sectors is planned as follows.

For agriculture, fishery, livestock breeding and food processing sector, clusters of ‘olive/olive oil’, ‘dates/derivatives’, ‘livestock/aquaculture and the product processing’, ‘(other) high potential products’ and ‘multisector (agricultural land) utilisation (product/processing)’ are planned (though ‘Food processing’ constitutes part of most of the clusters, it is described separately to explain the plans and actions simply). The phased development plan of the sector for 2015-2025 has to have the following stages. Generally, the period of each stage is to last two and a half years. At first, feasibility studies for marketing/branding, processing technology and institutional preparation (laws/regulations and organisations) have to be conducted as these activities/actions have been carried by companies in the northern or central-eastern parts of Tunisia at present. Next, pilot projects are to be implemented on a certain scale, followed by evaluation of pilot projects and reviews of the cluster development plans based on the results of the evaluations since the enterprises in the Southern Region have to verify the results of studies on marketing/branding/processing technology and to accumulate experiences of final processing and exporting. Afterwards, full-fledged development is planned.

- 1) Feasibility study & establishment of institutional framework
- 2) Test run of the pilot cluster

- 3) Evaluation & review of the pilot cluster
- 4) Deployment of the cluster

As for mining and other industrial sectors, clusters are planned for 'phosphate', 'construction materials', 'cosmetic products', 'oil and gas', 'textile', and 'renewable energy' sub-sectors. Phased development is to have the following three stages, excluding the 'textile' and 'renewable energy' sub-sectors. Since the manufacturing sector will generally face harsh competition, careful preparation to establish solid bases for the cluster development are recommended. First, institutional (laws/regulations and organisations) arrangements, research on market/resource reserves, etc., preparations for technology introduction, etc. have to be carried out. Second, resources (capital, human, technology) have to be accumulated for development of large-scale industries of strong competitiveness. Third, full-fledged promotion/development will continue. First and second stages will take two and a half years for each.

- 1) Establishment the basis for sustainable development,
- 2) Accumulation of resources (capital, human, technology) and network (and network)
- 3) Promotion (and innovation), autonomous development through innovation or upgrading the industry

The 'textile' sub-sector has the following specific stages, as this sub-sector has already developed to a certain degree and strengthened/upgraded design for a higher value added sub-sector is essential for the development of this sub-sector cluster.

- 1) Establishment of the institutional framework
- 2) Development of productive capacity and productivity
- 3) Design and product development
- 4) Promotion and innovation

Meanwhile, the 'renewable energy' sub-sector has the following different stages by dint of its inherent features:

- 1) A strengthened regional knowledge base and targeting, and accumulation of human resources
- 2) Investment in the demonstration and improvement of the business environment and infrastructure for innovation
- 3) Deployment/activation of clustering for manufacturing and services
- 4) Advancing private sector-led clustering and synergy creation with a wider array of economic activities

The tourism sector has the following stages for development of the diversified sector taking advantages of the various resources of the region. Although the contents of this sector are different from mining and other industrial sectors, a similar stage development is proposed as a kind of standard procedure. The following stages will enable systematic approaches, integrating various stakeholders of the sector.

- 1) Establishment of an institutional framework
- 2) Accumulation of human capital and business incentives
- 3) Development of tourism products and services
- 4) Promotion of the Destination

The handicraft sector has the following stages. Though stage development and detailed actions of each stage may vary product by product and region by region, generalised stages are proposed. With the

following stages, individual artisans and micro enterprises will be supported to form the competitive sector.

- 1) Knowledge creation
- 2) Skill building, know-how transfer, infrastructure
- 3) Activation of cluster network

Roadmap of cluster development according the development stages is shown in Table 2.1-4. Roadmaps of cluster development by product are shown in Table 2.1-5 - Table 2.1-8. Plans and action plans of productive sectors are explained in detail in Chapter 3 of this report.

Table 2.1-4 Roadmap of cluster development

Stages of Southern Region Cluster Development										Preparation	Formation	Execution	Expansion	Development	
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026-				
Administrative Activities for Regional Development															
Planning and Implementation of Southern Region Cluster Development Plan	Study & Planning Stage	Implementation Stage				Evaluation and Revision Stage	Study & Planning Stage	Implementation Stage				Evaluation and Revision Stage	Hold Southern Region Development Committee meeting twice a year		
Planning and Implementation of each Cluster Development Plan	Study & Planning Stage			Implementation Stage (Agricultural Sector)							Implementation Stage (Other Sectors)				Hold each Cluster Development Committee meeting six times a year
Agriculture, fishery, livestock breeding and food processing															
Dates	1. Feasibility study & establishment of institutional framework			2. Test run of the pilot cluster (- 2025)			3. Evaluation & review of the pilot cluster (- 2025)			4. Deployment of the cluster (- 2025)					
Olive	1. Feasibility study & establishment of institutional framework			2. Test run of the pilot cluster (- 2025)			3. Evaluation & review of the pilot cluster (- 2025)			4. Deployment of the cluster (- 2025)					
Livestock & Aquaculture	1. Feasibility study & establishment of institutional framework			2. Test run of the pilot cluster (- 2025)			3. Evaluation & review of the pilot cluster (- 2025)			4. Deployment of the cluster (- 2025)					
Food Processing	1. Feasibility study & establishment of institutional framework			2. Test run of the pilot project (- 2025)							4. Deployment of the project - 2025)				
High Potential Products	1. Feasibility study & establishment of institutional framework			2. Test run of the pilot cluster (- 2025)			3. Evaluation & review of the pilot cluster (- 2025)			3. Deployment of the cluster (- 2025)					
Multi-Sector Utilization	1. Feasibility study & establishment of institutional framework			2. Test run of the pilot project (- 2025)							3. Deployment of the project (- 2025)				
Mining and other industrial sectors															
Phosphate	1 Establishing the basis for sustainable development			2. Accumulation of resources (capital, human, scientific) and network (- 2025)			3. Autonomous development through innovation (- 2025)								
Construction material ※limestone, marble and gypsum	1 Establishing the basis for sustainable development			2. Accumulation of resources (capital, human, technology) and network (- 2025)			3. Promotion and innovation (- 2025)								
Cosmetic products	1 Establishing the basis for sustainable development			2. Accumulation of resources (capital, human, technology) and network (- 2025)			3. Promotion (- 2025)								

Oil and gas	1 Establishing the basis for sustainable development	2. Accumulation of resources (capital, human, technology) (- 2025)	3 Upgrade of the industry by developing metal service for oil and gas facilities (- 2025)		
Other potential natural resources ※ceramic, glass, silicate, salt	1 Establishing the basis for sustainable development	2. Accumulation of resources (capital, human, technology) and network (- 2025)	3. Promotion (- 2025)		
Textile	1 Establishing the institutional framework	2. Development of productive capacity and productivity (- 2025)	3. Design and product development (- 2025)	4. Promotion and innovation (- 2025)	
Renewable Energy	1. Strengthening regional knowledge base and targeting, and accumulation of human resources	2. Investment in demonstration and improvement of business environment and Infrastructure for Innovation (- 2023)	3. Deployment/Activation of clustering for manufacturing and services (- 2025)	4. Advancing private sector-led clustering and synergy creation with wider array of economic activities (- 2025)	
Tourism	1. Establishing institutional framework	2. Accumulating human capital and business incentives (- 2025)	3. Developing tourism products and services (- 2025)	4. Promoting the Destination (- 2025)	
Handicrafts	1. Knowledge Creation	2. Skill building, Know-how transfer, Infrastructure (- 2025)	3. Activation of Cluster Network (- 2025)		

Source: JET

Table 2.1-5 Roadmaps of cluster development by product for agriculture, livestock breeding, fishery and food processing sector

Dates

Short-term					Mid-term					
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Preparation		Formation			Execution			Expansion		
1. Feasibility study & establishment of institutional framework										
<p>AG-1-1-1 Data collection and analysis on existing water-saving irrigation system</p> <p>AG-1-2-1 Organizing quality improvement conference of dates</p> <p>AG-1-2-2 Quality improvement focusing on problems identified in each phase of dates production</p> <p>AG-1-2-5 Introduction of geographical identification (GI) for the branding of dates product</p> <p>AG-1-2-8 Research and development for the commercialization of dates processing products and minor varieties other than Deglet Nour</p> <p>AG-1-3-4 Founding subsidy and/or public loan system to promote the introduction of water-saving irrigation system</p> <p>AG-1-4-1: Establishing the monitoring structure for the calculation of physical productivity of water for dates</p>										
2. Test run of the pilot cluster										
<p>AG-1-1-2 Examination of several models of water-saving irrigation system</p> <p>AG-1-2-4 Disseminating organic cultivation and securing traceability of dates</p> <p>AG-1-2-6 Further localisation of the sorting and storage of dates</p> <p>AG-1-2-7 Promotion of the development of complete factories of dates located in the Southwest</p> <p>AG-1-3-1 Introduction of standardized materials and equipment necessary for dates cultivation</p> <p>AG-1-3-2 Introduction of energy-saving equipment</p> <p>AG-1-3-3 Promoting group purchase of standardized materials and equipment</p> <p>AG-1-3-4 Founding subsidy and/or public loan system to promote the introduction of water-saving irrigation system</p> <p>AG-1-4-2 Provision of further financial and material support to farmers in proportion to physical productivity of water for dates</p> <p>AG-1-5-1 Implementing vocational training on new cultivation technology for young farmers and candidates</p> <p>AG-1-5-2 Implementing training to promote and manage farmers groups</p>										
3. Evaluation & review of the pilot cluster										
<p>AG-1-1-3 Establishing standard model of water-saving irrigation including the method to</p> <p>AG-1-2-3 Establishing and disseminating models of cultivation and processing to enhance quality</p>										
4. Deployment of the cluster										
<p>AG-1-1-4 Dissemination of the model of water-saving irrigation system</p> <p>AG-1-2-4 Disseminating organic cultivation and securing traceability of dates</p> <p>AG-1-2-6 Further localizing of sorting and storage of dates</p> <p>AG-1-2-7 Promotion of the development of complete factories of dates located in the Southwest</p> <p>AG-1-3-3 Promoting group purchase of standardized materials and equipment</p> <p>AG-1-3-4 Founding subsidy and/or public loan system to promote the introduction of water-saving irrigation system</p> <p>AG-1-4-2 Explanation and dissemination of the established law to farmers for sustainable use of water resource and agricultural land</p> <p>AG-1-5-1 Implementing vocational training on new cultivation technology for young farmers and candidates</p> <p>AG-1-5-2 Implementing training to promote and manage farmers groups</p>										
【Plan】										
<p>AG-1-1: Increasing physical productivity of water for dates</p> <p>AG-1-2: Increasing value of dates</p> <p>AG-1-3: Decreasing production cost</p> <p>AG-1-4: Expanding cultivation area under the condition of water saving</p> <p>AG-1-5: Capacity building of farmers and farmers' groups</p>										

Olive

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution			Expansion				
1. Feasibility study & establishment of institutional framework									
AG-2-1-1 Planning of marketing of olive oil through implementation of STP AG-2-1-2 Differentiating oil product AG-2-2-5 Restructuring of subsidies for the promotion of high valued added olive oil instead of subsidy to increase quantity of olive tree									
2. Test run of the pilot cluster									
AG-2-1-2 Executing continuous sales promotion targeting niche market AG-2-1-3 Differentiating oil product AG-2-1-4 Promotion of the conversion from bulk product to bottled product AG-2-2-1 Further promotion of cold press AG-2-2-2 Shortening lead time between harvest to processing AG-2-2-3 Further dissemination of organic cultivation and securing traceability AG-2-2-4 Strengthening the resilience of olive production AG-2-3-1 Promotion of group purchase of materials AG-2-3-2 Enhancing linkage between oil mills and bottlers AG-2-3-3 Increasing the ratio of commercialized second pressing olive oil AG-2-4-1 Implementing vocational training on new cultivation technology for young farmers and candidates AG-2-4-2 Implementing training to promote and manage farmers groups									
3. Evaluation & review of the pilot cluster									
AG-2-1-5 Evaluation and review of the implemented actions for enhancement of brand value of olive oil AG-2-2-6 Evaluation and review of the implemented actions for quality improvement of olive oil AG-2-3-4 Evaluation and review of the implemented actions for enhancement of bottled olive oil sales									
4. Deployment of the cluster									
[Plan] AG-2-1: Enhancement of brand value of olive oil AG-2-2: Improvement of the quality of olive oil and stability of olive oil production AG-2-3: Enhancement of bottled olive oil sales and second pressing oil product AG-2-4: Capacity building of farmers and farmers' groups					AG-2-1-4 Promotion of the conversion from bulk product to bottled product AG-2-2-1 Further promotion of cold press AG-2-2-2 Shorting lead time between harvest to processing AG-2-2-3 Further dissemination of organic cultivation and securing traceability AG-2-2-4 Strengthening the resilience of olive production AG-2-3-1 Promotion of group purchase of materials				

Livestock & Aquaculture

Short-term					Mid-term					
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Preparation	Formation	Execution					Expansion			
1. Feasibility study & establishment of institutional framework										
<p>AG-3-1-1 Study on the compound feed made of local organic substances</p> <p>AG-3-1-3 Financial support to livestock breeders/aquaculture farmers for equalization of seasonal difference</p> <p>AG-3-2-3 Development of tracing system</p> <p>AG-3-2-4 Study on local species of livestock/aquaculture products</p> <p>AG-3-3-4 Introduction of new technology, equipment and system including operational training for livestock breeders/aquaculture</p>										
2. Test run of the pilot cluster										
<p>AG-3-1-2 Promotion of the production of forage crops</p> <p>AG-3-1-4 Establishment of collective procurement system of animal feed</p> <p>AG-3-2-1 Development of processing/storage bases and logistics network</p> <p>AG-3-2-2 Quality improvement focusing on each phase of value chain</p> <p>AG-3-3-1 Further promotion of the establishment of breeders' groups</p> <p>AG-3-3-2 Promotion of collective procurement of feed and materials</p> <p>AG-3-3-3 Promotion of collective sales activity</p> <p>AG-3-3-4 Introduction of new technology, equipment and system including operational training for livestock breeders/aquaculture farmers</p>										
3. Evaluation & review of the pilot cluster										
<p>AG-3-1-5 Evaluation and review of the implemented actions for increasing productivity of animal feed</p> <p>AG-3-2-5 Evaluation and review of the implemented actions for improvement of quality and value of livestock /aquaculture products</p>										
4. Deployment of the cluster										
<p>AG-3-2-1 Development of processing/storage bases and logistics network</p> <p>AG-3-3-1 Further promotion of the establishment of breeders' groups</p> <p>AG-3-3-2 Promotion of collective procurement of feed and materials</p> <p>AG-3-3-3 Promotion of collective sales activity</p> <p>AG-3-3-4 Introduction of new technology, equipment and system including operational training for livestock breeders/aquaculture farmers</p>										
<p>[Plan]</p> <p>AG-3-1: Increasing productivity of animal feed</p> <p>AG-3-2: Increasing the quality and value of livestock /aquaculture products</p> <p>AG-3-3: Promotion of collective activity and capacity development of livestock breeders/aquaculture farmers</p>										

High Potential Products

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution			Expansion				
1. Feasibility study & establishment of institutional framework AG-4-1-1: Introduction and promotion of promising agricultural products AG-4-1-2: Further promotion of promising livestock breeding products AG-4-1-3: Introduction and promotion of promising aquaculture products AG-4-1-4: Further research and development for commercialisation of promising local species									
2. Test run of the pilot project AG-4-1-1: Introduction and promotion of promising agricultural products AG-4-1-2: Further promotion of promising livestock breeding products AG-4-1-3: Introduction and promotion of promising aquaculture products AG-4-2-1: Further diffusion of decentralised water desalination system AG-4-2-2: Renewing and re-evaluation of existing agricultural equipment, materials, and systems AG-4-2-3: Diffusion of innovative water-saving materials and agricultural methods AG-4-3-1: Dissemination of good practices and advantages of farmer's groups AG-4-3-2: Reinforcement of the function of existing GDAs AG-4-3-3: Further promotion of the establishment of agricultural material shops for collective and efficient procurement AG-4-3-4: Promotion of collective production and sales by farmer's groups AG-4-3-5: Establishment of professional farmer's groups by product for capacity development of farmers and other farmer's groups <Governorate>									
					3. Deployment of the project AG-4-1-1: Introduction and promotion of promising agricultural products AG-4-1-2: Further promotion of promising livestock breeding products AG-4-1-3: Introduction and promotion of promising aquaculture products AG-4-2-1: Further diffusion of decentralised water desalination system AG-4-2-2: Renew and re-evaluation of existing agricultural equipment, materials, and systems AG-4-2-3: Diffusion of innovative water-saving materials and agricultural methods AG-4-3-1: Dissemination of good practices and advantages of farmer's groups AG-4-3-2: Reinforcement of the function of existing GDAs AG-4-3-3: Further promotion of the establishment of agricultural material shops for collective and efficient procurement AG-4-3-4: Promotion of collective production and sales by farmer's groups				
[Plan] AG-4-1: Introduction and promotion of promising products AG-4-2: Introduction and promotion of innovative agricultural technology AG-4-3: Promotion of the establishment and enhancement of farmers' groups (cooperatives, mutual companies, etc.) for collective procurement, production and sales									

Food Processing

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution			Expansion				
1. Feasibility study & establishment of institutional framework									
<p>AG-5-2-1: Organising and running the conference of interest parties related to the bases for food processing and circulating use of local organic substances</p> <p>AG-5-2-2: Examination of development plan contributing to the reinforcement of linkage among local farmers, food processing factories and supporting industries</p> <p>AG-5-3-1: Establishment of compost station, organic waste collection network, and organic fertiliser distribution network</p> <p>AG-5-3-2: Establishment of rendering station for further reuse of organic waste as animal feed</p>									
2. Test run of the pilot cluster									
<p>AG-5-1-1: Rehabilitation of infrastructure in and around the existing industrial zone</p> <p>AG-5-1-2: Promotion of the attraction of food processing factory related to major agricultural products produced around the industrial zone</p> <p>AG-5-1-3: Promotion of the attraction of supporting industry</p> <p>AG-5-3-3: Further promotion of utilisation of local organic substances and sub products</p> <p>AG-5-3-4: Study on fertiliser made from poultry and cow manure for the production of quality dates and olive</p>									
3. Evaluation & review of the pilot cluster									
<p>AG-5-1-4: Evaluation and review of the implemented actions for activation of existing industrial zone</p> <p>AG-5-3-5: Evaluation and review of the implemented actions for promotion of circulating use of local organic substances</p>									
4. Deployment of the cluster									
<p>AG-5-1-1: Rehabilitation of infrastructure in and around the existing industrial zone</p> <p>AG-5-1-2: Promotion of the attraction of food processing factory related to major agricultural products produced around the industrial zone</p> <p>AG-5-1-3: Promotion of the attraction of supporting industry</p> <p>AG-5-3-3: Further promotion of utilisation of local organic substances and sub products</p> <p>AG-5-3-4: Study on fertilizer made from poultry and cow manure for the production of quality dates and olive</p>									
<p>[Plan]</p> <p>AG-5-1: Activation of existing industrial zone</p> <p>AG-5-2: Reinforcement of the linkage among local farmers, food processing factories and supporting industries</p> <p>AG-5-3: Promotion of circulating use of local organic substances in and around the bases</p>									

Multi-Sector Utilization

2016		2017		Short-term			Mid-term				
2016		2017		2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution						Expansion			
				<p>1. Test run of the pilot project</p> <p>AG-6-1-1 Rehabilitation and improvement of irrigation infrastructure of triple-layered oases</p> <p>AG-6-1-2 Promotion of collective activities to increase productivity among triple-layered oasis farmers</p> <p>AG-6-1-3 Promotion of activities in oases taking advantage of the uniqueness and biodiversity</p> <p>AG-6-2-1 Enhancement of pastureland development program being implemented by OEP</p> <p>AG-6-2-2 Promotion of livestock breeding</p> <p>AG-6-2-3 Establishment of logistic service for integrated activities of pastureland development, livestock breeding, food processing, and handicraft</p>							
				<p>2. Deployment of the project</p> <p>AG-6-1-1 Rehabilitation and improvement of irrigation infrastructure of triple-layered oases</p> <p>AG-6-1-2 Promotion of collective activities to increase productivity among triple-layered oasis farmers</p> <p>AG-6-1-3 Promotion of activities in oases taking advantage of the uniqueness and biodiversity</p> <p>AG-6-2-1 Enhancement of pastureland development program being implemented</p> <p>AG-6-2-2 Promotion of livestock breeding</p> <p>AG-6-2-3 Establishment of logistic service for integrated activities of pastureland development, livestock breeding, food processing, and handicraft</p>							
<p>[Plan]</p> <p>AG-6-1: Promotion of multifunctional use of existing oases</p> <p>AG-6-2: Further development and sustainable management of pastureland in cooperation with livestock breeding, food processing, and handicraft</p>											

Table 2.1-6 Roadmaps of cluster development by product for mining and other industrial sectors

Phosphate

Short-term			Mid-term						
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution			Expansion				
1 Establish the basis for sustainable development									
<p>MN-1-1-1-1: Identifying the potential processing or products which utilise the purified phosphoric acid produced by GCT</p> <p>MN-1-1-1-2: Finding out technological requirements to enable the production of the applied areas specified above</p> <p>MN-1-1-2-4: Making the environmental assessment mandatory for new large scale investment in mining and processing sectors.</p> <p>MN-1-1-2-5: Conducting study on the potential phosphate resources in Tozeur and the prospects of their exploitation</p> <p>MN-2-2-2-6: Proposing a formula with which each region will benefit from a certain proportion of its natural resources for its economic and social development</p> <p>MN-3-2-1: Establishing the monitoring system to measure the air pollutants and wastes generated by the production activities of chemical and mining sector</p>									
2. Accumulation of resources (capital, human, scientific) and network									
<p>MN-1-1-2-1: Providing financial incentives for the investments in the products specified in the study done in MN1-1-1</p> <p>MN-1-1-2-2: Spreading the technological related information on the production of these products to investors and other stakeholders</p> <p>MN-1-1-2-3: Using the technological information for consulting entrepreneurs and SMEs who engage in these areas</p> <p>MN-1-2-1: Creating a platform for the development of these industries</p> <p>MN-1-1-3: Developing human resources for the specific activities for the newly established firms</p> <p>MN-3-2-2: Promoting investment of environmentally friendly technique or equipment</p> <p>MN-3-2-3: Promoting firms to introduce environmental management system</p> <p>MN-3-2-4: Promoting firms to introduce water saving technology</p>									
[Plan]			3. Autonomous development through innovation						
<p>MN-1-1: Promoting the establishment of new firms which use purified phosphate acid (in which GCT will implement to produce in the near future)</p> <p>MN-1-2: Promoting inter- and intra-sectoral knowledge spill-over and linkages in order to enhance new business opportunities and investment in the applied areas of phosphate acid</p> <p>MN-1-3: Enhancing R&D and innovation for sustainable development of this sector</p>			<p>MN-1-2-2: Through the platform, enhancing the dialogue and cooperation with other industries</p> <p>MN-1-3-1-1: Promoting the collaborative research with industry and research institutes by giving financial support and/or facilitation of collaborative researches.</p> <p>MN-1-3-1-2: Promoting the contract research from industry to research institute by giving financial support and/or facilitation</p> <p>MN-1-3-2: Identifying the research areas which likely to benefit the phosphate related industries in the South.</p>						
MN-2-2: Developing the production capacity of natural resource processing industries									
MN-3-2: Promoting the environmentally friendly technique in the chemical and mining sectors									

Mineral Resource (Construction material (such as limestone, marble and gypsum))

Short-term					Mid-term									
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025					
Preparation	Formation	Execution					Expansion							
1 Establish the basis for sustainable development														
<p>MN-2-1-1-1: Preparing the mapping/ inventory of sustainable and non-sustainable resources with the estimation of their durability and sustainable utilisation</p> <p>MN-2-1-1-2: Establishing the regional plan of resource utilisation activities and the value chain of each potential mineral resource</p> <p>MN-2-1-2-1: Conducting the feasibility studies for the development of potential mineral resources</p> <p>MN-2-1-2-2: Conducting value chain analysis which proposes the possible processing areas and new business opportunities</p> <p>MN-2-2-2-1: Making the environmental assessment mandatory for new large scale investment in mining and processing sectors</p> <p>MN-2-2-2-3: Including the rehabilitation of mining sites as one condition for the permission of new investment in mining</p> <p>MN-2-2-2-6: Proposing a formula with which each region will benefit from a certain proportion of its natural resources for its economic and social development</p> <p>MN-3-2-1: Establishing the monitoring system to measure the air pollutants and wastes generated by the production activities of chemical and mining sector</p>														
2. Accumulation of resources (capital, human, technology) and network														
<p>MN-2-2-2-4: Including the potential construction products to the positive list for investment promotion and providing financial incentives for the investments</p> <p>MN-2-2-2-5: Spreading the technology related information on the production of these products to investors and other stakeholders</p> <p>MN-2-2-2-7: Preparing a large scale industrial zone in Tataouine for mining and processing natural resources</p> <p>MN-2-2-3-1: Creating the industrial association for the mining and natural resource processing sectors.</p> <p>MN-2-2-3-2: Holding the matching events of producers and users or seminars which promote new business opportunities</p> <p>MN-2-2-4-1: Developing human resources for processing and manufacturing activities of mineral resources</p> <p>MN-2-2-5-1: Establishing the techno-pole for the promotion and management of the natural resource utilisation.</p> <p>MN-3-2-2: Promoting investment of environmentally friendly technique or equipment</p> <p>MN-3-2-3: Promoting firms to introduce environmental management system</p> <p>MN-3-2-4: Promoting firms to introduce water saving technology</p>														
3. Promotion and innovation														
<p>MN-2-2-2-8: Promoting large scale investments in Tataouine for mining and processing natural resources</p> <p>MN-2-2-4-1: Establishing the marketing intelligence unit to promote natural resource processed products to international markets</p> <p>MN-2-2-4-2: Promoting natural resource processed products made in the South by participating in exhibitions</p> <p>MN-2-2-5-2: Comprehensive management the strategies by techno-pole to promote natural resources sectors suggested in MN-2-2</p>														
<p>[Plan]</p> <p>MN-2-1: Conducting the comprehensive studies of the potential mineral resources for their sustainable utilisation</p> <p>MN-2-2: Developing the production capacity of natural resource processing industries</p> <p>MN-3-2: Promoting the environmentally friendly technique in the chemical and mining sectors</p>														

Mineral Resource (Cosmetic products)

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution					Expansion		
1. Establish the basis for sustainable development									
<p>MN-2-1-1-1: Preparing the mapping/ inventory of sustainable and non-sustainable resources with the estimation of their durability and sustainable utilisation</p> <p>MN-2-1-1-2: Establishing the regional plan of resource utilisation activities and the value chain of each potential mineral resource</p> <p>MN-2-1-2-1: Conducting the feasibility studies for the development of potential mineral resources</p> <p>MN-2-1-2-2: Conducting value chain analysis which proposes the possible processing areas and new business opportunities</p> <p>MN-2-2-2-1: Making the environmental assessment mandatory for new large scale investment in mining and processing sectors</p> <p>MN-2-2-2-3: Including the rehabilitation of mining sites as one condition for the permission of new investment in mining</p> <p>MN-2-2-2-6: Proposing a formula with which each region will benefit from a certain proportion of its natural resources for its economic and social development</p> <p>MN-3-2-1: Establishing the monitoring system to measure the air pollutants and wastes generated by the production activities of chemical and mining sector</p>									
2. Accumulation of resources (capital, human, technology) and network									
<p>MN-2-2-2-4: Providing financial incentives for the investments in cosmetic products or related activities</p> <p>MN-2-2-2-5: Spreading the technology related information on the production of these products to investors and other stakeholders</p> <p>MN-2-2-3-1: Creating the industrial association for the mining and natural resource processing sectors.</p> <p>MN-2-2-3-2: Holding the matching events of producers and users or seminars which promote new business opportunities</p> <p>MN-2-2-5-1: Establishing the techno-pole for the promotion and management of the natural resource utilisation.</p> <p>MN-3-2-2: Promoting investment of environmentally friendly technique or equipment</p> <p>MN-3-2-3: Promoting firms to introduce environmental management system</p> <p>MN-3-2-4: Promoting firms to introduce water saving technology</p> <p>MN-2-3-1: Establishing training courses for processing to cosmetic products in the existing vocational schools in the South</p> <p>MN-2-3-2: Using the output of value chain analysis for consulting entrepreneurs and SMEs who engage in these area</p>									
[Plan]					3. Promotion				
<p>MN-2-1: Conducting the comprehensive studies of the potential mineral resources for their sustainable utilisation</p> <p>MN-2-2: Developing the production capacity of natural resource processing industries</p> <p>MN-2-3: Promoting the production of cosmetic products which are made from such products as salt, clay, and olive oil</p> <p>MN-3-2: Promoting the environmentally friendly technique in the chemical and mining sectors</p>					<p>MN-2-2-2-1: Establishing the marketing intelligence unit to promote natural resource processed products to international markets</p> <p>MN-2-2-5-2: Comprehensive management of the strategies to promote natural resources sectors by techno-pole suggested in MN-2-2</p> <p>MN-2-3-3-1: Promoting the cosmetic products made in the South by participating in exhibitions</p>				

Oil and gas

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation		Formation		Execution			Expansion		
1 Establish the basis for sustainable development									
<p>MN-2-1-1-1: Preparing the mapping/ inventory of sustainable and non-sustainable resources with the estimation of their durability and sustainable utilisation</p> <p>MN-2-1-1-2: Establishing the regional plan of resource utilisation activities and the value chain of each potential mineral resource</p> <p>MN-2-2-2-1: Making the environmental assessment mandatory for new large scale investment in mining and processing sectors</p> <p>MN-2-2-2-3: Including the rehabilitation of mining sites as one condition for the permission of new investment in mining</p> <p>MN-2-2-2-6: Proposing a formula with which each region will benefit from a certain proportion of its natural resources for its economic and social development</p> <p>MN-3-2-1: Establishing the monitoring system to measure the air pollutants and wastes generated by the production activities of chemical and mining sector</p>									
2. Accumulation of resources (capital, human, technology)									
<p>MN-2-2-2-5: Spreading the technology related information on the production of these products to investors and other stakeholders</p> <p>MN-2-2-1: Developing human resources for processing and manufacturing activities of mineral resources</p> <p>MN-2-2-5-1: Establishing the techno-pole for the promotion and management of the natural resource utilisation.</p> <p>MN-2-4-1-1: Establishing professional training courses for the works at treatment plant and LPG plant</p> <p>MN-2-4-1-2: Establishing vocational training courses for the works at treatment plant and LPG plant</p> <p>MN-2-4-2: Making the employment of the youth in the local communities mandatory for oil and natural gas companies</p> <p>MN-3-2-2: Promoting investment of environmentally friendly technique or equipment</p> <p>MN-3-2-3: Promoting firms to introduce environmental management system</p> <p>MN-3-2-4: Promoting firms to introduce water saving technology</p>									
[Plan]					3 Upgrade of the industry by developing metal service for oil and gas facilities				
<p>MN-2-1: Conducting comprehensive studies of the potential mineral resources for their sustainable utilisation</p> <p>MN-2-2: Developing the production capacity of natural resource processing industries</p> <p>MN-2-4: Promote the related industries for gas pipeline and LPG bottling plants</p> <p>MN-3-2: Promote the environmentally friendly technique in the chemical and mining sectors</p>					<p>MN-2-4-2-1: Promoting investments in metallic sector in Tataouine</p> <p>MN-2-4-2-2: Establishing professional training courses for metal processing</p>				

Textile

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution					Expansion		
1 Establish the institutional framework									
<p>MN-4-2-1: Establishing the textile industry association in the South</p> <p>MN-4-2-2-1: Encouraging associations for conduct information gathering from the stakeholders and market and technology researches</p>									
2. Development of productive capacity and productivity									
<p>MN-4-3-1: Promoting investment of the textile sector by providing financial incentives for investment</p> <p>MN-4-3-2: Developing human resources for the textile industry by establishing vocational trainings courses</p> <p>MN-4-3-3: Improving the productivity of firms by giving consultation on production</p>									
3. Design and product development									
<p>MN-4-1-1: Developing the human resources for design and product development by establishing training courses for design in the South</p> <p>MN-4-1-2: Promoting investment in design and product development activities by including textile design and product development to the positive list for investment promotion and providing financial incentives for the investments</p>									
[Plan]					4 . Promotion and innovation				
<p>MN-4-1: Promoting design and product development activities in apparel sector</p> <p>MN-4-2: Promoting the linkages in the textile sector in order to enhance new business opportunities and investment</p> <p>MN-4-3: Enhance the productive capacities of textile sector</p>					<p>MN-4-1-3: Promoting the South brand apparel products in the international markets</p> <p>MN-4-2-3: Holding the matching events of producers and users or seminars which promote new business opportunities</p>				

Renewable Energy

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution					Expansion		
Applicable to both MN-5-1 and MN-5-2									
1. Strengthening regional knowledge base and Targeting, and Accumulation of Human Resources (MN-5-1 and 5-2 Action 1 and 2)									
<ul style="list-style-type: none"> - Establishment of institutional framework (for R&D, training, funding, supervision) at the regional level (South). - Domestic/local market studies; External markets and technical/regulatory assessments. - Evaluation of the strategic value chain areas (components-assembly-service) to target. - Definition of pilot project(s) and identification of pilot geographic area(s). - Feasibility studies, strengthening of incubation functions and investment promotion. - Promotion of strategic alliances amongst research/academic institutions and potential investors/companies. - Building a pool of trained experts and technicians. 									
2. Investment in Demonstration and Improvement of Business Environment and Infrastructure for Innovation(MN-5-1 and 5-2 Action 3)									
<ul style="list-style-type: none"> - Encouragement of partnerships with foreign companies to enable knowledge transfer and export (in the longer run). - Implementation of pilot projects and evaluation. - Establishment of business models (firm level, supply/value chains, related services). - Active promotion of investments in the industrial zones. - Planning synergy creation with other sectors where green energy is applicable. 									
3. Deployment/Activation of clustering for manufacturing and services (MN-5-1 and 5-2 Action 4)									
<ul style="list-style-type: none"> - Encouragement of partnerships with foreign companies to enable knowledge transfer and export (continued). - Implementation of synergy creation plan, focusing on public domain. 									
4. Advancing private sector-led clustering and synergy creation with wider array of economic activities (MN-5-1 and 5-2 Action 5)									
<ul style="list-style-type: none"> - Investment incentives for innovative companies. - (Re)boosting public-led incubation supports. 									
<p>[Plan] MN-5-1: Strengthening value chain of Solar Water Heating system.</p> <p>MN-5-2: Building foundation to produce components of Photovoltaic (PV) modules and systems, and related services.</p>									

Table 2.1-7 Roadmap of cluster development for tourism sector

Short-term				Mid-term					
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution			Expansion				
1. Establishing institutional framework									
<ul style="list-style-type: none"> TM-1-1: Establishing the Destination Management Organization (DMO) TM-2-1: Establishing laws, standards or "Cahier des charge" for tourism services TM-4-1: Establishing the "Community Based Tourism Organization (CBTO) TM-5-1: Establishing an agricultural cooperative 									
2. Accumulating human capital and business incentives									
<ul style="list-style-type: none"> TM-1-2: Establishing destination contracts TM-2-2: Providing professional training courses for new tourism services TM-4-3: Providing necessary training for local people TM-5-2: Providing necessary training on the agro-tourism TM-1-4: Creating a taxation system particularly for tourism development TM-2-4: Providing subsidies for encouraging entrepreneurs 									
3. Developing tourism products and services									
<ul style="list-style-type: none"> TM-2-3: Improving regional tourism infrastructure TM-3-1: Conserving material heritages TM-3-2: Conserving immaterial heritages TM-3-3: Registering local heritages on the national and/or UNESCO's world heritage list TM-3-4: Creating tourist circulation TM-3-5: Developing tourist sites TM-4-2: Developing "Eco-museum" 									
4. Promoting the Destinations									
<ul style="list-style-type: none"> TM-1-3: Promoting the destinations to domestic and international markets TM-5-1: Promoting agro-tourism 									
<p>【Plan】</p> <ul style="list-style-type: none"> TM-1: Creation and promotion of destinations for all seasons in the Southern Region. TM-2: Development of tourism services to meet with international standards TM-3: Rehabilitation and conservation of material and immaterial heritages in the Southern Region TM-4: Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society. TN-5: Exploitation of agro-tourism by collaboration with agriculture sector 									

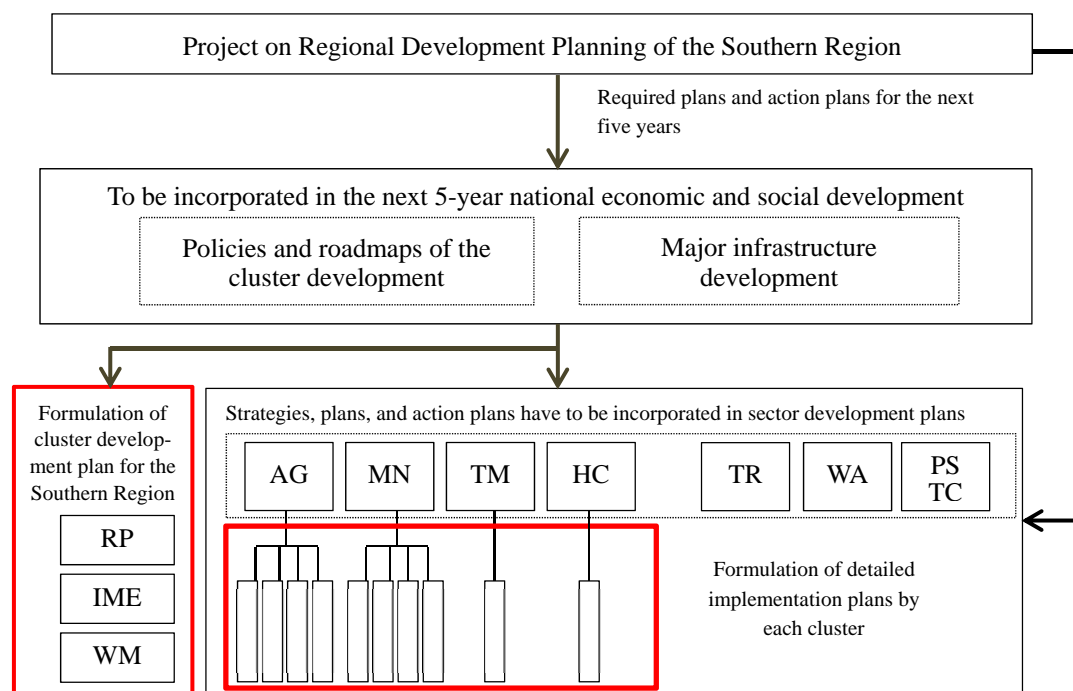
Table 2.1-8 Roadmap of cluster development for handicraft sector

Short-term					Mid-term				
2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Preparation	Formation	Execution			Expansion				
1. Knowledge Creation									
<p>HC-1-1-1: Needs assessments of primary processed raw materials in the region. HC-1-1-2: Assessment and monitoring of volume of relevant livestock raising. HC-1-1-3: Assessment of the bases of the artisans (individuals and groups). HC-1-1-4: Introduction of system to recognize the master artisans. HC-1-1-5: Feasibility studies and investment promotion. HC-1-2-1: Formation of marketing committee HC-1-2-2: Branding strategy elaboration (concept, standard-setting, common value creation)</p>									
2. Skill building, Know-how transfer, Infrastructure									
<p>HC-1-1-6: Investment promotion. HC-1-1-7: (Re)organization of local supply chain and enhancement of value chain. HC-1-1-8: Improvement of access to raw materials of high quality at good price. HC-1-2-3: Establishment and application of quality standards. HC-1-2-4: Raising domestic awareness of "Made in South of Tunisia" HC-1-3-1: Design and Production skill up-grading. HC-1-3-2: Business management skill enhancement. HC-1-3-3: Improvement of access to finance.</p>									
[Plan]					3. Activation of Cluster Network				
<p>HC-1-1: Development and Strengthening of Value Chain of Wool and leather handicrafts HC-1-2: Reinforcement of Marketing and Commercialization of traditional and modern design of "Made in South of Tunisia" products (applicable to non-wool/leather based handicrafts as well) HC-1-3: Strengthening of micro and small scale handicrafts enterprises (applicable to non-wool/leather based handicrafts as well)</p>					<p>HC-1-2-5: Launching on joint advertisement and promotional activities. HC-1-2-6: Strengthening strategic alliance with tourism sector. HC-1-3-4: Continuous efforts of the same lines of actions from the previous phase.</p>				

2.1.6 Policies for implementation of development strategies, plans and action plans for the Southern Region

Cluster development will proceed according to the policies and roadmaps shown above. Infrastructure corresponding to the progress of the cluster development should be developed considering the socio-economic development of the region as well. To ensure implementation of plans and action plans proposed by the Project, it is necessary to incorporate policies and roadmaps of the cluster development as well as major infrastructure development in the next 5-year national economic and social development plan.

Strategies, plans and action plans of each of the productive sectors and infrastructure development will have to be incorporated in development plans of the respective sectors. Cluster development plan for the Southern Region has to be formulated under the coordination of MDICI and ODS, referring the plan RP-4-1 described in Section 3.1.3 of Chapter 3 of this report. Detailed implementation plan of each cluster development has to be formulated by the public administration in charge of the productive sector as described in the same section.



Source: JET

Figure 2.1-1 Flow of the implementation of regional development plan for the Southern Region

(1) Policy for infrastructure development

Required infrastructure for cluster development includes that of roads, railways, airports, ports, water supply facilities, wastewater treatment facilities, power supply facilities and telecommunication facilities.

As for road networks, development of trunk and main roads as well as rural roads (called development roads in this report) is important in short to medium term. Improvement of trunk roads (upgrade and expansion) corresponding to the future traffic demands, including logistic requirement due to development of the productive sectors, is planned. Road pavement will be the major action for

improvement of development roads. The road development will be completed by around 2023 when expansion stage of cluster development is expected to start. Upgrading of international airports will be completed by 2023 considering tourism development. Upgrading of Zarzis Port and Gabès Port as well as railway construction (Zarzis–Tataouine) will be finished in around 2026 when development stage of the cluster development is expected to start.

Regarding the water supply, phase-1 construction will be completed by 2016 before the formation stage of the cluster development starts, while phase-2 construction will be finished by 2020 before execution of the execution stage of the mining and manufacturing sector starts. As for power supply facilities and telecommunication facilities, their developments are planned to correspond to the demand increase, including those caused by productive sector development.

(2) Development of R&D Centres and Processing Centres

Logistics centre or distribution centre will be installed according to the cluster development of agriculture, livestock breeding, fishery and food processing sector and mining and other industrial sectors as well as production development of the two sectors. In the long-term, logistics function will be enhanced with expansion of the port facilities.

As for the development of agricultural R&D Centres and Processing Centres (industrial zones) for agriculture, livestock breeding, fishery and food processing, existing centres will be utilised at the stages of preparation, formation and execution. These centres will be upgraded or new centres will be established by 2023 when the cluster development reaches the expansion stage, taking volume and types of products into account.

R&D Centres necessary for mining and manufacturing development will have to be established at early stage for governorates without the centres. Processing centres will be developed and equipped with necessary infrastructure according to the cluster development, the production and processing activities of the area. Overall roadmap of the cluster development in the Southern Region is provided in Table 2.1-9. Locations of the infrastructure development listed in Table 2.1-9 are illustrated in Section 2.2 of this chapter.

Table 2.1-9 Overall roadmap of cluster development in the Southern Region

Roadmap of Southern Region Cluster Development

Stages of Southern Region Cluster Development										Preparation	Formation	Execution	Expansion	Development							
										2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 - 2035	
Administrative Activities for Regional Development																					
Planning and Implementation of Southern Region Cluster Development Plan		Study & Planning Stage		Implementation Stage		Evaluation and Revision Stage		Study & Planning Stage		Implementation Stage		Evaluation and Revision Stage		Hold Southern Region Development Committee twice a year							
Planning and Implementation of each Cluster Development Plan		Study & Planning Stage		Implementation Stage (Agricultural Sector)		Implementation Stage (Other Sectors)								Hold each Cluster Development Committee six times a year							
Productive Sector Cluster Development Activities for each sector with targeted products																					
Agriculture, fishery, livestock breeding and food processing																					
Dates		1. Feasibility study & establishment of institutional framework				2. Test run of the pilot cluster (~2025)		3. Evaluation & review of the pilot cluster (~2025)		4. Deployment of the cluster (~2025)											
Olive		1. Feasibility study & establishment of institutional framework				2. Test run of the pilot cluster (~2025)		3. Evaluation & review of the pilot cluster (~2025)		4. Deployment of the cluster (~2025)											
Livestock & Aquaculture		1. Feasibility study & establishment of institutional framework				2. Test run of the pilot cluster (~2025)		3. Evaluation & review of the pilot cluster (~2025)		4. Deployment of the cluster (~2025)											
Food Processing		1. Feasibility study & establishment of institutional framework				2. Test run of the pilot Project (~2025)				3. Deployment of the Project (~2025)											
High Potential Products		1. Feasibility study & establishment of institutional framework				2. Test run of the pilot cluster (~2025)		3. Evaluation & review of the pilot cluster (~2025)		4. Deployment of the cluster (~2025)											
Multi-Sector Utilization		1. Feasibility study & establishment of institutional framework				2. Test run of the pilot Project (~2025)				3. Deployment of the Project (~2025)											
Mining and other industrial																					
Phosphate		1. Establish the basis for sustainable development		2. Accumulation of resources (capital, human, scientific) and network (~2025)		3. Autonomous development through innovation (~2025)															
Construction material ※such as limestone, marble and gypsum		1. Establish the basis for sustainable development		2. Accumulation of resources (capital, human, technology) and network (~2025)		3. Promotion and innovation (~2025)															
Cosmetic products		1. Establish the basis for sustainable development		2. Accumulation of resources (capital, human, technology) and network (~2025)		3. Promotion (~2025)															
Oil and gas		1. Establish the basis for sustainable development		2. Accumulation of resources (capital, human, technology) and network (~2025)		3. Upgrade of the industry by developing metal service for oil and gas facilities (~2025)															
Other potential natural resources ※ceramic, glass, silicate, salt		1. Establish the basis for sustainable development		2. Accumulation of resources (capital, human, technology) and network (~2025)		3. Promotion (~2025)															
Textile		1. Establish the institutional framework		2. Development of productive capacity and productivity (~2025)		3. Design and product development (~2025)		4. Promotion and innovation (~2025)													
Renewable Energy		1. Strengthening regional knowledge base and Targeting, and Accumulation of Human Resources		2. Investment in Demonstration and Improvement of Business Environment and Infrastructure for Innovation (~2023)		3. Deployment/Activation of clustering for manufacturing and services (~2025)		4. Advancing private sector-led clustering and synergy creation with wider array of economic activities (~2025)													
Tourism		1. Establishing institutional framework (~2018)		2. Accumulating human capital and business incentives (~2025)		3. Developing tourism products and services (~2025)		4. Promoting the Destination (~2025)													
Handicraft		1. Knowledge Creation		2. Skill building, Know-how transfer, Infrastructure (~2025)		3. Activation of Cluster Network (~2025)															
<p>The actions noted below should be also implemented for more effective development to improve economic efficiency during the cluster expansion stage.</p> <ul style="list-style-type: none"> ✓Improvement of productivity of each company, producer and sector ✓Strengthening of innovative and creative capacity and skills ✓Create, bring-in or establish new projects, production and businesses in relation with the existing industries or potential resources 																					

② Necessary Infrastructure for Southern Region Cluster Development

Development of Major Infrastructure (New Development & Improvement (Expansion or Rehabilitation))										2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026 - 2035	
Road Network Development																					
Development of National Road Network between cities (including bridges) ※1		Survey, Planning, Designing of new Roads and/or Improvement of existing roads																Start of Services to public in order of completion			
Development of Regional Road Network		Survey, Planning, Designing of new Roads and/or Improvement of existing roads																Start of Services to public in order of completion			
Railway, Airport and Sea Port Development																					
Development of Railway Network		Survey, Planning, Designing of new Railway ※2								New Construction										Start of Services to public	
Airport Development		Survey, Planning, Designing for facility improvement								Improvement Work								Start of Services to public			
Sea Port Development		Survey, Planning, Designing for new facility and existing port Expansion ※2								New Construction and Expansion Work										Start of Services to public	
Water Supply, Power Supply and Telecommunication Network Development																					
Development of Desalination Plants				Start of Services to public in order of completion								Start of Services to public in order of completion									
Development of Power Supply and Telecommunication Network										Survey, Planning, Designing		Improvement Work						Start of Services to public in order of completion			
Development of Major Facilities in relation with Productive Sector Cluster Development																					
Common Facility Development																					
Logistic Centre Development		Survey, Planning, Designing		Improvement Work		Start of Services to public in order of completion				Survey, Planning, Designing		Improvement Work		Start of Services to public in order of completion				Start of Services to public			
Facility Development for Agriculture, Fishery and Food Processing Sector Cluster Activities																					
Research and Development Centre Development										Survey, Planning, Designing		Improvement Work		Start of Services to public in order of completion							
Industrial Park Development (including FEZ)										※2 Survey, Planning, Designing		New Construction & Improvement Work		Start of Services to public in order of completion							
Facility Development for Mining and Manufacturing Sector Cluster Activities																					
Research and Development Centre Development		Survey, Planning, Designing		Improvement Work		Start of Services to public in order of completion															
Industrial Park Development (including FEZ)										※2 Survey, Planning, Designing		New Construction		Start of Services to public in order of completion							

※1 Implement the development of road network based on the progress of on-going construction and operation of national highways in the southern region in order to have efficient connections.

- National Highway (high-speed) between Sfax and Gabes is under construction and is expected for public service opening in several months.
- National Highway (high-speed) between Gabes and Ben Guerdane is expected for public service opening in 2019.
- National Highway (high-speed) between Tunis and Gafsa is under planning and the completion schedule has not been set yet.

※2 The "survey" should include the period of land acquisition and preparation before the development of infrastructure. All necessary laws and regulations for the land use, land acquisition and related administrative actions shall be ready (either adjusted or established newly) before the actual land acquisition for the development should take place.

2.2 Spatial development plan

2.2.1 Objectives of preparing spatial development plan

A spatial development plan¹ is prepared to visualize the development of the productive sectors in a geographical form, and in order to understand areas or locations (geographical arrangement and relation) of each of the sectoral development strategies and plans. It should significantly help in integrating inter-sectoral and inter-governorate developments into coordinated and effective structure or organism, and the map should indicate several development nodes, such as areas for logistics services and development poles in the network. Based on the development of the productive sectors, flow of materials, products and people as well as productive activities also becomes clear so that the organized spatial development plan will help in understanding necessary infrastructural development, which becomes the foundation of development of the productive sectors of the region as well. The development elements illustrated in the maps (spatial development plans), except the map of current status of the Southern Region, spatially explain major development targets by sector strategies prepared by JET, taking comments discussed in the public consultation meetings into account.

Through the surveys conducted by JET including public consultation meetings, it is identified that the Project will focus on the following productive sectors: a) Agriculture, fishery, livestock breeding and food processing sector, b) Mining and manufacturing sector, c) Tourism sector and d) Handicraft sector (not shown in the development maps due to widely spread locations of various activities). Each productive sector has specific strategies and plans based on its potentials and constraints as well as competitiveness in the market, and the strategies and plans of each sector indicate particular locations of activities and the networks. Therefore, each sector's development strategies and plans are mapped in order to visualize spatial layout of the unique regional development.

2.2.2 Current condition of the Southern Region

Information and data collected through the Project from concerned government agencies and entities related to development have been analysed and arranged into a geographical map to illustrate the potential in natural resources and current activities of the productive sectors in the Southern Region. Norms and regulations related to land use including the Code (Code de l'Aménagement du Territoire et de l'Urbanisme) were also analysed, and they are included to illustrate the current important condition of the region. According to the latest national census data, there are several areas in the Southern Region that have population outflow or very little increase, and these areas should be well taken into consideration on promoting economic and productive activities to change the current population outflow trend. The following are the major elements identified as development potentials of the Southern Region:

- There are large volume of mineral resources, such as limestone, dolomite, silica, marble stone, and gypsum, identified along the central mountain range stretching throughout the Southern Region.
- There are natural oil and gas reserves in far south area of Tataouine, and profit share can possibly be given to the region by the central government.

¹ The word '*plan*' in 'spatial development *plan*' refers to the general meaning of the word and not the one specifically defined in other parts of the report.

- There are some agricultural products, which have very high potential to create regional brands in the world market, due to their nutritional contents and value (Dates and Olive).
- There is large area of natural field to strengthen small-scale livestock breeding, such as sheep and camel.
- There are some potential land being considered for naturally grown herbs and grass based products for cosmetics and healthcare business.
- The Southern Region is a large showcase of natural beauty of Sahara and Oasis culture as well as archaeological and heritage structures and elements spread in the region, and these should be well treated for more effective utilisation and tourist attraction.
- There are geothermal resources in Gabès, Tozeur and Kébili, which can be used for agricultural purposes, such as off-season vegetable production, and tourist attraction, such as geothermal therapy.
- There are two seaports along the Mediterranean coastline and the cities of Gabès and Zarzis have the international gateway for expansion of trading.
- The Region has borders with Libya and Algeria, potential neighbouring markets for many products, especially construction materials from the region.
- There are potential industrial, production and/or logistic centres/zones being developed or planned in the Southern Region by governorate (refer to Table 2.2-1).
- There are existing facilities near the borders for international trades with Algeria and Libya, such as the ones in Dehiba, Tataouine Ben Guerdane, and Médenine.
- Existing airports and seaports as well as railway network are the targets of the upgrade to ensure better economic impact of the regional production and industrial activities requiring higher capacity and stable transportation of products and goods of the region.

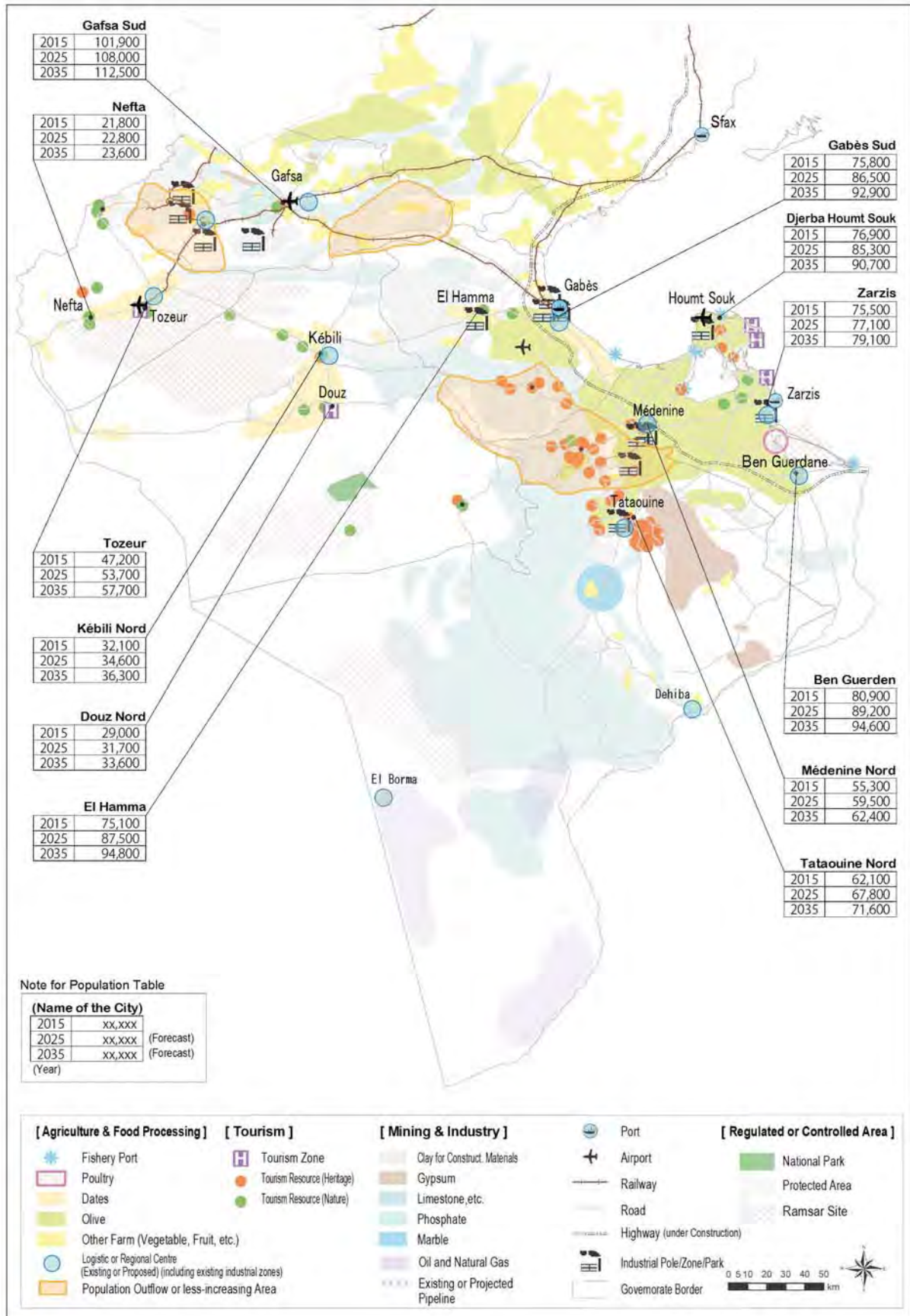
Figure 2.2-1 also illustrates the above potential elements in the map.

In order to utilise potential resources and products in the region, production centres, processing centres, regional product distribution centres, research and development (R&D) centres and regional development poles should be developed in the region. There are many existing industrial zones, projected industrial zone developments and techno-poles, and these will be effectively utilised to develop centres necessary for productivity improvement. When there are no enough spaces for further development in the zones (Tataouine as an example), new land should be allocated for the development of new industrial and/or production centres/zones. Table 2.2-1 shows existing industrial zones in the Southern Region.

Table 2.2-1 Industrial zones in the Southern Region in 2013

	Number of industrial zone	Total area (ha)	Area equipped with infrastructure (ha) (a)	Area used (ha) (b)	% of area used (b/a)	Total number of lot	Number of lot exploited
Tataouine	2	24.7	14.9	11.7	78%	47	45
Médenine	2	63.0	11.0	4.2	38%	165	20
Gabès	1	828.0	300.0	182.0	61%	150	80
Kébili	8	140.9	65.3	31.0	47%	99	93
Tozeur	11	104.7	-	27.5	-	212	44
Gafsa	11	264.0	-	60.0	-	174	22
Sud	35	1,425.3	391.2	316.4	-	847	304

Source: Sud en chiffres 2013, ODS



Source: JET

Figure 2.2-1 Map of current status of productive sectors and natural resources of the Southern Region

2.2.3 Spatial development plan for agriculture, fishery, livestock breeding and food processing sector

This sector mainly focuses on integrated structure of production, processing and packaging for delivery to both domestic and international markets. The agricultural sector mainly concentrates on dates in Tozeur and Kébili, and on olive in Médenine (and a lesser extent in Gafsa, Gabès and Tataouine). Gafsa is mainly considered for other agricultural products including grains, vegetables and fruit, and Tataouine is targeted to grow vegetables, especially potato. The sector is also considering off-season vegetable production in greenhouse farming utilizing geothermal water (wherever available) and heat in wide areas in the region. Dates processing will take place in Tozeur and Kébili where majority of dates are produced. In the long-term (2026-35), more concentrated dates processing including packaging facilities may be developed in a new food processing centre (s) in Médenine. Packaging process for olive oil products may also be concentrated in Zarzis area for ease of logistics. The fishery sector mainly focuses on shrimp, shell and fish farming around Djerba and Zarzis and canned fish processing to export from Zarzis. Figure 2.2-2 illustrates the core development of the sector.

In order to effectively utilise the processing centres to be developed in Gabès and Médenine, they will be concentrated in the areas nearby other food processing industries including dairy products for mainly domestic consumption. Besides, Tataouine, Gafsa, Tozeur and Kébili are also considered for meat production and processing. Each governorate will develop processing centre that also provides logistic and distribution services. Gafsa, in particular, will become a new logistic and distribution centre for agricultural products between north, central and south Tunisia as well as between Tunisia and Algeria, so that other products from central and north Tunisia could be transported through Gafsa to several cities in Algeria, west of Tozeur.

(1) Five-year spatial development plan

(a) Outline of the development

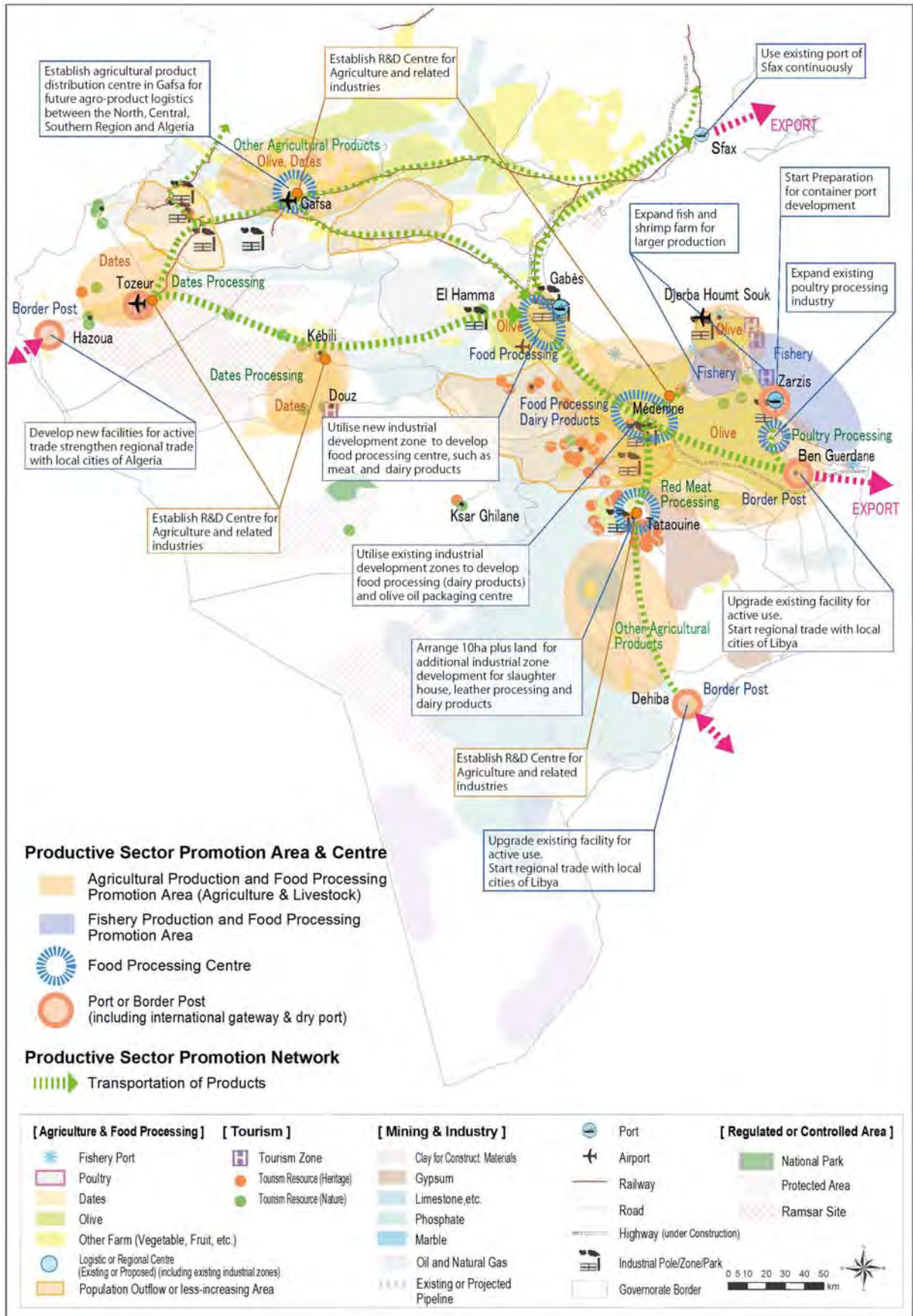
It is important to prepare appropriately the facilities and infrastructures necessary for effective production and processing in the agricultural sector for the next twenty years and beyond. Research and development (R&D) centres in the region should also be developed for improvement in local production, new product development and market studies. In Gabès and Médenine as international gateway with seaports near the cities, implementation of infrastructure and facility development, such as that for transport and water/power supply, in the existing or projected production areas and processing centres should be given priority for wider marketing strategy including local, Libyan and Algerian markets before expansion of agro-production takes place in the region.

Reduction of regional disparity is the important aspect that makes earlier development actions to focus mainly in Gafsa, Tozeur, Kébili and Tataouine. Larger portion of products in the region would be still exported from Sfax or Rades in the short-term period (2015-20); however, the processing of dates and olive oil should be gradually shifted to the Southern Region to achieve value-added production, and to be strongly competitive in the world market. Possible greenhouse development sites for expansion of off-season vegetable production will be surveyed during this period as well. Earlier in this period, the R&D study for the strong regional product selection should be initiated for future establishment of production cluster in the Southern Region.

(b) Key development

- Existing or projected industrial and development poles/zones in Gabès are to be utilised as larger processing centres for processing of dairy products, red meat for domestic and Libyan markets), etc.
- Existing or projected industrial and development poles/zones in Médenine and Zarzis are to be utilised as larger processing centres for processing of olive oil, dairy products, red meat, etc.
- Processing centres have to be further developed in Kébili and Tozeur for more effective dates production and processing, and connection between production areas and processing centres has to be enhanced.
- Agricultural product distribution centre has to be developed in Gafsa for inter-regional (central and north Tunisia) and international agro-product transportation and logistics as Gafsa has been acting as the regional logistic area between the North, Central and Southern regions as well as Algerian markets.
- New land should be acquired for the large production centre development in Tataouine (outside of the city area) in order to establish processing facilities within ten year period considering slaughter houses, leather processing and meat product processing.
- Border Posts in Hazoua in Tozeur Governorate and Dehiba in Tataouine Governorate are to be upgraded, utilizing existing facilities for better trading with cities in Algeria and Libya.
- Border Post including dry port with refrigeration facility in Ben Guerdane is to be upgraded utilizing existing facility for larger trade service with Libyan market.
- Fish and shrimp farming areas and facilities near Djerba and Zarzis are planned to be expanded for larger production.
- Preparation for Zarzis container port development next to the existing bulk port for packaged agricultural product export is planned to start, aiming at completion of the port development as early as 15th project year.
- The poultry meat processing centre and egg distribution centre in south Zarzis is planned to be expanded for larger production considering both domestic and Libyan consumption.
- Research and development (R&D) centres are to be established or strengthened in Gafsa, Tozeur, Kébili, Tataouine and Médenine. Existing R&D centres are to be utilised for extended activities in agricultural R&D. In R&D Centres, marketing research as well as production technology and capital investment studies is planned to be conducted for products of respective governorates.

Figure 2.2-2 illustrates the first five-year spatial development plan in agriculture, fishery, livestock breeding and food processing sector.



Source: JET

Figure 2.2-2 Five-year spatial development plan for agricultural and related sector

(2) Ten-year spatial development plan

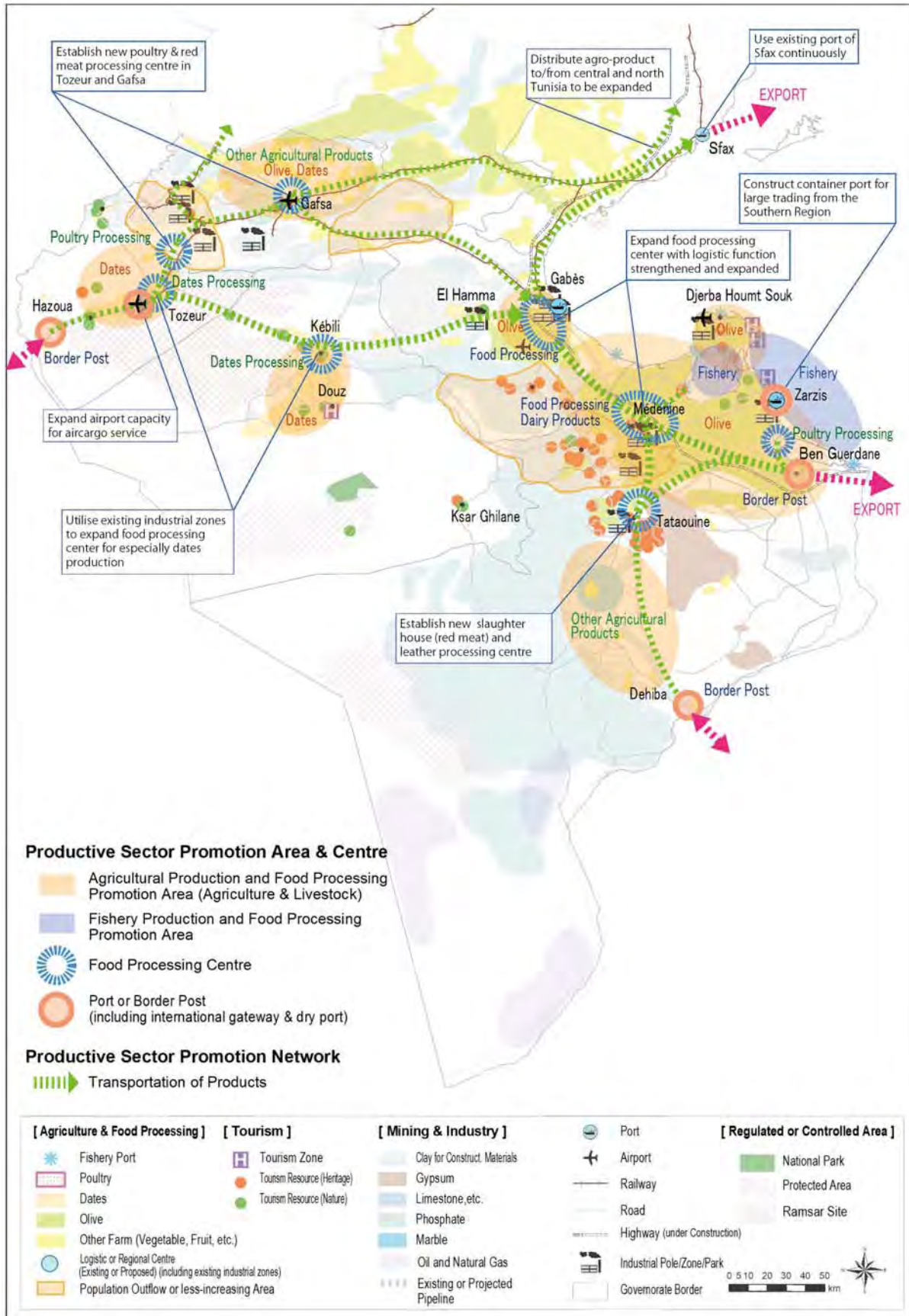
(a) Outline of the development

During this period, more effective production of dates, preserving resources, for example, should be achieved introducing proper irrigation system/techniques. Agricultural cooperatives will be established or enhanced for more organised production, harvesting, collective shipping, processing, etc., in major products, such as dates and olive. Greenhouse off-season vegetable production in the region will start actually for high value-added export. Other agricultural production in Tozeur, Kébili, Tataouine and Gafsa will be expanded for domestic consumption as well as for exporting to the neighbouring countries. It is necessary in this period to establish appropriate marketing targets and business schemes for exporting agro-products from Southern Region, as the Zarzis port development will be completed in the next period. As the agricultural production increases in the region, the demand for products from central and north Tunisia will decrease, and such situation could be considered as an opportunity for export of the products to neighbouring countries; thus, the border service centre as well as regional distribution centre should be well operated for the regional distribution services. Expansion of ordinary agricultural production is to be made within the areas where the population outflow is observed, and as a result, more job opportunities is expected to be provided to these areas which currently have fewer employment options. Based on the short-term R&D study for product selection in the region, production clusters will be established for more cooperative productive activities. The centres for production clusters will also be established for effective and efficient sector development.

(b) Key development

- Existing or projected industrial and development poles/zones in Tozeur and Kébili are to be utilised to establish processing centres for dates products in more concentrated operation.
- New poultry processing and egg distribution centre is planned to be established in Tozeur-Gafsa area for domestic distribution as well as Algerian cities in southwest of Tozeur.
- Agro-product distribution centre in Gafsa is to be expanded, according to the increasing product flow in the region.
- Construction of Zarzis container port as well as expansion of bulk port is to be started.
- Processing centres in Gabès and Médenine are planned to be expanded for larger production with stable operation for production of quality food or other products.
- New processing centre is planned to be established in Tataouine where the land has to be allocated in the previous period, and slaughterhouse, leather processing facility, meat product processing facility, for instance, is to be developed for operation utilizing livestock resources in Tataouine area as well as possibly imported ones from Libya. Leather processing facility may be located in slightly remote site in order to prevent odour problem in populated areas.
- Demand in meat and vegetable is expected to increase in this period in Libya, and therefore, the export related service facilities in Ben Guerdane are to be upgraded.
- Fishery products from Djerba and Zarzis is to increase, and therefore, the processing facilities in Zarzis are to increase.
- Agricultural production clusters in the region are planned to be established based on the R&D activity efforts and results for highly selected regional products aiming the international market.

Figure 2.2-3 illustrates the ten-year spatial development plan in this sector.



Source: JET

Figure 2.2-3 Ten-year spatial development plan for agricultural and related sector

(3) Twenty-year spatial development plan

(a) Outline of the development

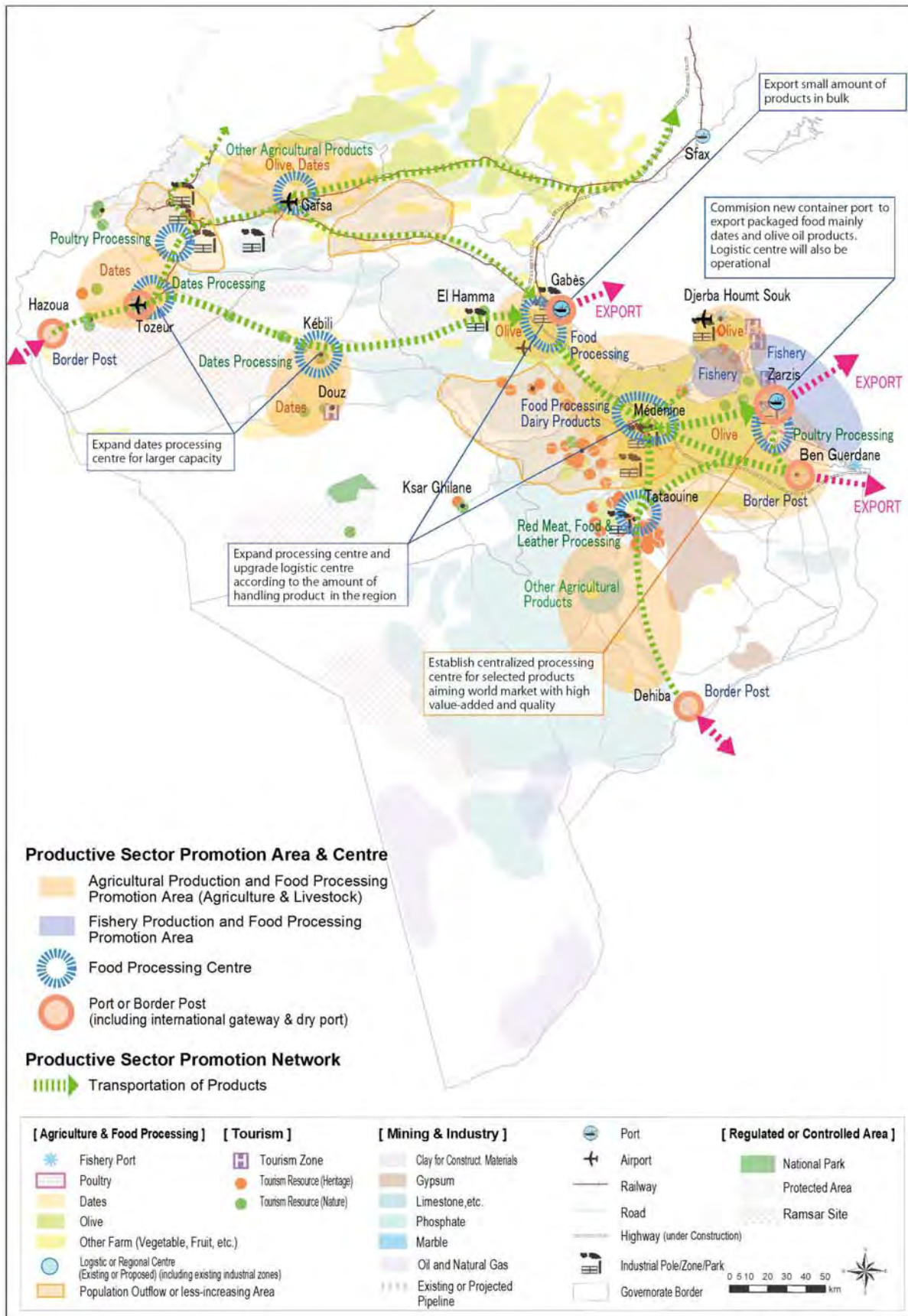
Major development in this period is to open the container and expanded bulk port in Zarzis for operation, and selected agricultural and fishery product export/distribution activities is to be shifted from Sfax.

During the short- and medium-term period (2015-2025), marketing effort in each sector or governorate could have come with more promising markets and product needs. According to the productive activities in previously established clusters, more concentrated processing and packaging activities will be realized in the cluster considering best exporting method and location. Some products may be considered for more centralized processing and/or packaging to effectively compete in the international markets. Therefore, production clusters should be well equipped for full service including final packaging for export. For instance, Zarzis, when it is set as a production cluster, will be developed utilizing the existing allocated land focusing on such specialty products with high quality and high value-added processing and packaging. Large transportation of the sector products to Sfax may be reduced except distribution to central and north Tunisia for their consumption. Some products may be exported from the bulk port in Gabès, according to the demand. Under the Zarzis container port operation, more agricultural products can be exported so that the local production will be increase and contribute to the regional development; therefore, the agro-production activities implemented in the population out-flow areas is expected to reverse its population trend into stable increase.

(b) Key development

- Zarzis container port is to expanded bulk port facility is to be operational earlier in this period (considering the 15th year of the project duration or earlier).
- Production clusters are to be upgrade or expanded.
- Logistic services are to be developed and upgraded corresponding to production cluster and processing centre development.
- Gabès bulk port is to be upgraded for product export other than chemical industrial products.
- Concentrated processing centres in production clusters, such as Zarzis centre, are planned to be developed for immediate processing operation and for larger capacity of high quality and value-added agricultural production, so that the Southern Region products are to become competitive in the international market through more concentrated processing and packaging schemes.
- Networking between production clusters and the ports has to be strengthened for more effective exporting activities.

Figure 2.2-4 illustrates the twenty-year spatial development plan in this sector.



Source: JET

Figure 2.2-4 Twenty-year spatial development plan for agricultural and related sector

2.2.4 Spatial development plan for mining and other industrial sectors

There are large areas of lands in the Southern Region with potential mineral resources. Other than the phosphate currently being excavated at mines in Gafsa and limestone being processed in El Hamma and Kébili, large amount of gypsum, marble stone, limestone and silica, have, for example, been identified in Tataouine. These major mineral resources need to be effectively utilised with large investments for regional industrial development and progress. Gypsum, limestone and marble stone should be high potential products for export aiming at the European market. Locally produced red clay bricks and cement, particularly those produced in Kébili and Médenine, should be continuously developed for exporting in larger amount, especially to Libya. In addition, the handicraft sector exists in large areas of the Southern Region (in, near or around the urban areas), although the sector production activities are not concentrated in specific areas. This sector will be strengthened locally. Development of the use of renewable energy is planned to be encouraged all over the Southern Region due to high potential with backup of the national policy and target through foreign direct investments, while water heater equipment production is to be promoted in Gafsa and Médenine. Gabès which is currently serving as a major chemical industrial zone is planned to be further developed as the regional industrial pole with high-tech de-pollution and control systems for more environmental and sustainable development. Other than developing Gabès as the industrial pole, Médenine and Gafsa are to have concentrated industrial zones: Médenine for construction materials and Gafsa for Phosphate materials. Gafsa industrial zone for phosphate production should also be equipped with de-pollution system.

Oil and gas mining facilities in El Borma of the middle west of Tataouine Governorate have been producing certain quantity of oil and gas, and the pipelines have extended to Sfax. The pipelines have been installed under the central government projects. However, the regional development plan considers the employment and development of the service sectors related to development of oil and gas production as pipelines will be further installed locally in the Southern Region. The regional development plan should consider these resources as potential of the region, and the region should properly benefit from these resources.

New industrial development in the South-west Region, namely Gafsa, Tozeur and Kébili, will be implemented in order to improve regional employment rate and to reduce regional disparity within the Southern Region. Possible products include construction material, cosmetics, etc., utilising local useful substances. The sector considers both domestic and international markets for product distribution; therefore, the border service centres set in the region should be effectively utilised for proper transportation of products in wide range of volume.

Upgrade of the capacity of existing port in Gabès as well as new container port development in Zarzis are required corresponding to the development of production and high value-added processing of natural resources. Construction works for the development of the two ports are scheduled in the medium term. The port of Sfax will be used for exporting products requiring container shipping until Zarzis port becomes operational.

(1) Five-year spatial development plan

(a) Outline of the development

Most importantly, the Gafsa and Gabès chemical industrial zones shall be de-polluted with introducing proper treatment system/technology. Major phosphate related processing centres in Gafsa and Gabès

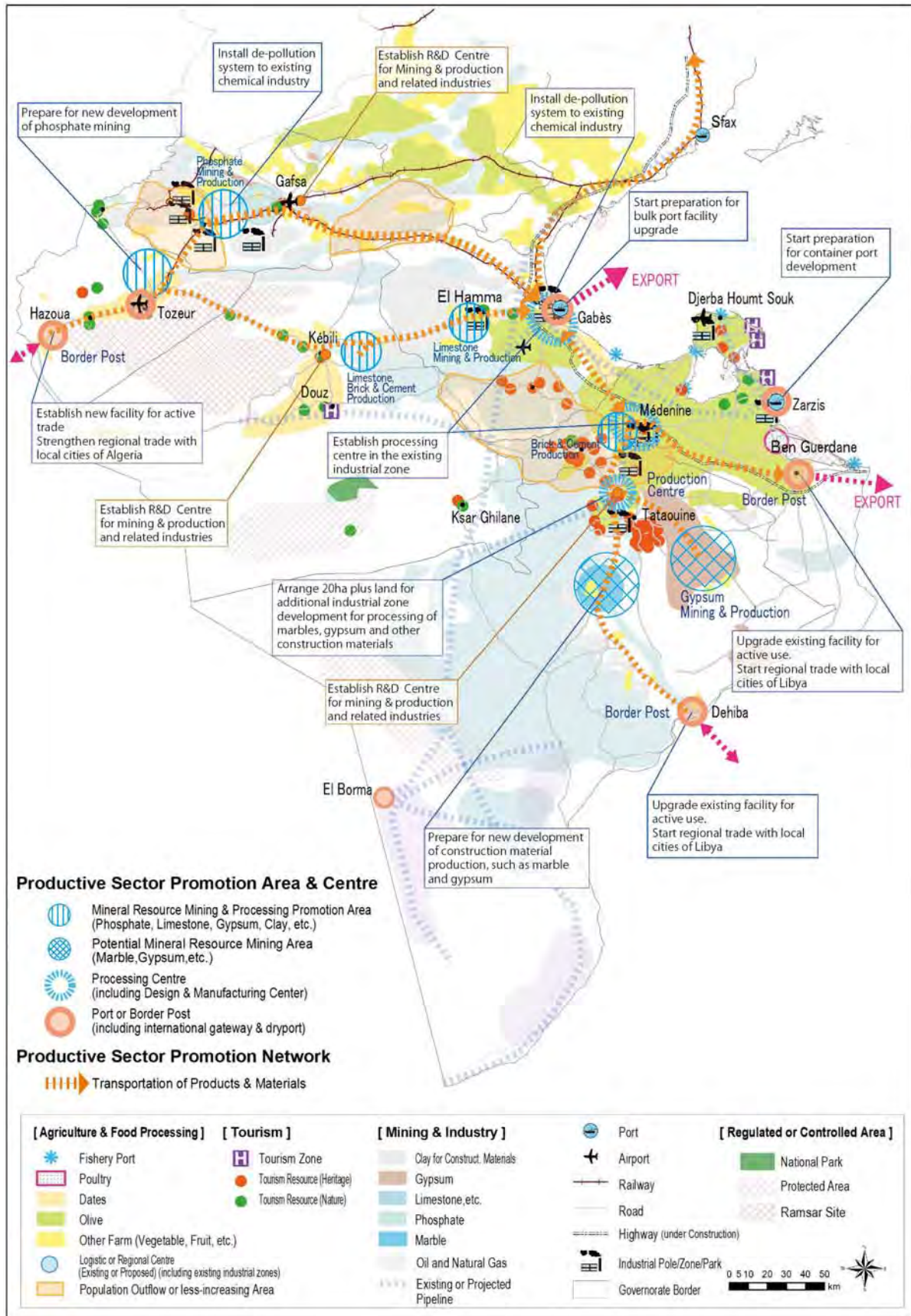
will continue serving, and the products will be exported from the Gabès port as well. However, upgrade of the bulk port facility may be necessary for shipping other products including construction materials. Safety and environmental protection measures shall be taken for additional industrial development for food processing and export even though they should be set in distance. The size of the phosphate related chemical industry may not be largely expanded. Although current production of phosphate ore from Gafsa is stable, the production in the next twenty years will be decreasing; therefore, new phosphate mining site should be identified to supply the materials to the chemical manufacturers. Potential Tozeur mining site will be identified in this period for future development. Tataouine governorate area investment should be for development of new marble stone mining and expansion of the existing gypsum and limestone production mining sites. Tataouine should become a major mining region for construction materials, such as marble stone, gypsum and others for mass production and high quality designed products.

R&D for marketing and product improvement as well as vocational school type facility for the art & craft workers should be established for better production in the sector. Earlier in the short-term period, the R&D study for selection of the strong regional product should be initiated for future establishment of production cluster in the Southern Region.

(b) Key development

- De-pollution and treatment system installation in the chemical industries in Gabès and Gafsa shall be implemented.
- Existing industrial and development poles/zones in Gabès and Médenine will be utilised for larger processing centre development, such as construction materials and high-value designed architectural materials and other stone products.
- New land acquisition should be made for large processing centre development in Tataouine (outside of the urban area) in order to establish processing centre within ten year period considering marble stone, limestone and gypsum processing.
- Border Post in Hazoua, Tozeur and Dehiba, Tataouine will be established utilizing existing facilities for better trading with cities in Algeria and Libya.
- Border Post including dry port in Ben Guerdane will be upgraded utilizing existing facility for larger trade service with Libyan market.
- Preparation for Zarzis container port development next to the existing bulk port for construction material export will be started aiming at the completion of the port development in 15 years.
- Facility and infrastructure preparation to develop phosphate ore mining will be started in Tozeur and marble stone mining in Tataouine.
- R&D Centres will be established in Gafsa, Kébili and Tataouine for extended activities in mineral research and development as well as marketing and worker skill improvement program.

Figure 2.2-5 illustrates the five-year spatial development plan of mining and other industrial sectors.



Source: JET

Figure 2.2-5 Five-year spatial development Plan for mining and other industrial sectors

(2) Ten-year spatial development plan

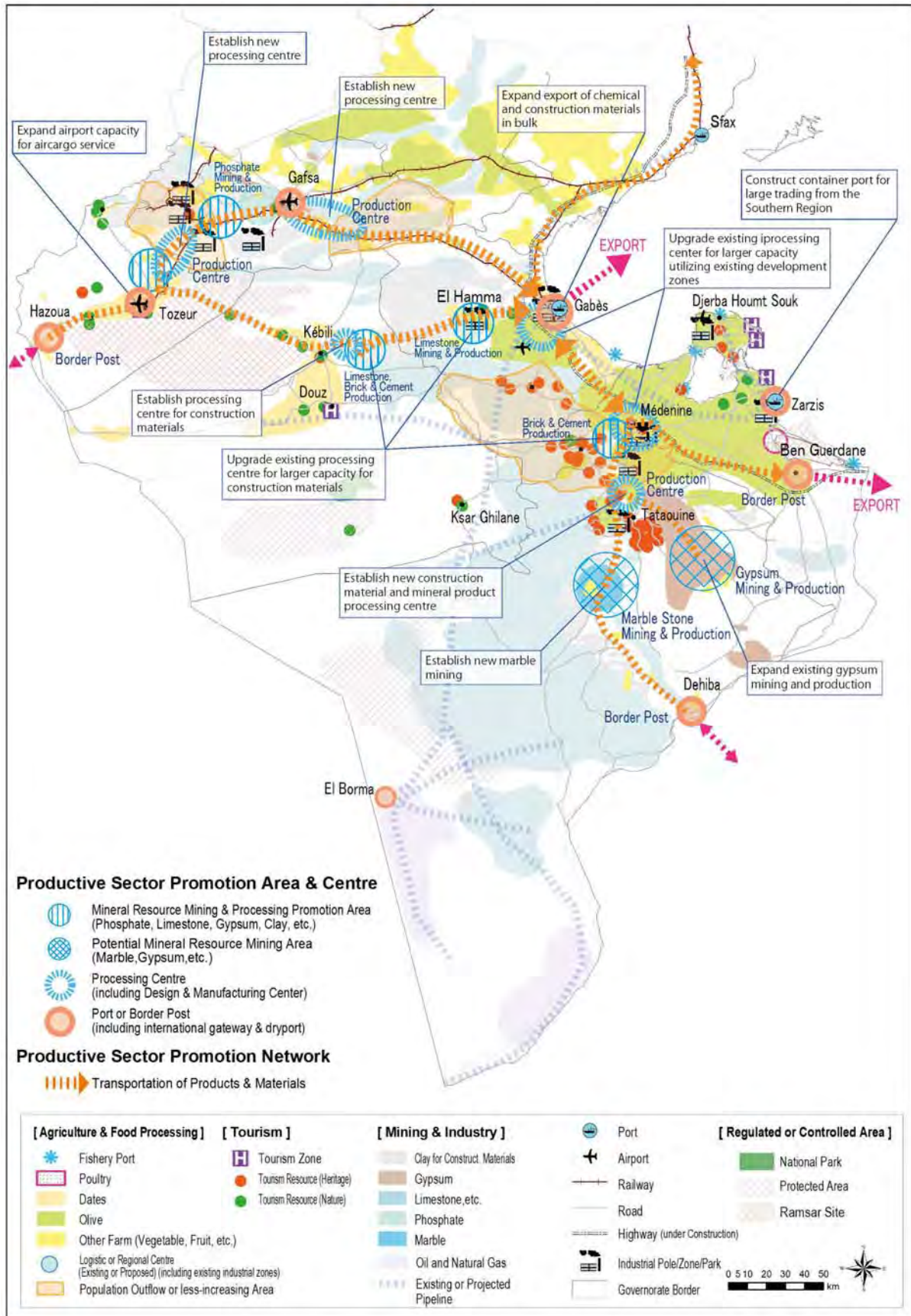
(a) Outline of the development

Western region, particularly Gafsa and Tozeur, should be treated for job creation, introducing new industries fully utilising and upgrading the existing airports and facilities in order to support the newly introduced production in these areas. Due to the distance from the seaport for product export, air-cargo and railway freight services from have to be improved. The processing centre in Tataouine area will be established for operation in this period so that the mineral resource (marble stone, limestone and gypsum) mining and processing are to be promoted in a larger scale. Transportation service with larger capacity between Médenine and Tataouine is planned. The existing processing centres in Kébili, Médenine, Gabès and Tataouine should be upgraded or expanded for larger construction material production. Overall production in minerals and construction materials will increase; therefore, the distribution and custom services at the country borders should be improved for larger capacity, especially in Ben Guerdane which is exporting products to Libya. Processing centres in Médenine should be further improved for higher value-added production of stones and construction materials for international markets. Based on the earlier period R&D study for product selection in the region, production clusters will be established for more cooperative productive activities. The centres for production clusters will also be developed for effective and efficient sector development.

(b) Key development

- New processing centres are planned to be established in Tozeur for textile/garment and cosmetic industries.
- New processing centres are to be established in Gafsa partly utilizing the existing industrial zones for processing of construction materials, cosmetic products and textile/garment industry.
- Existing construction material production centres is to be expanded and improved in El Hamma and in east of Kébili for larger production of limestone products, bricks and cement products.
- Processing centres in Gabès and Médenine are to be upgraded for larger production.
- Distribution service and logistic facilities in Médenine and Gabès are to be improved for larger product handling.
- Implementation of Zarzis container port construction should start aiming its completion earlier in the next period, and this includes expansion of bulk port facility.
- Tataouine processing centre will be established for mineral product processing and construction material production including high-value designed products.
- New marble stone mining zones are to be developed in Tataouine, Gafsa and Gabès.
- Existing gypsum mining yard is to be expanded for larger production mainly in Tataouine.
- Export of chemical products and materials from the Gabès port is to increase.
- Production clusters in the region are planned be established based on the R&D activity efforts and results of the highly selected regional products aiming at the international market.

Figure 2.2-6 illustrates the ten-year spatial development plan in this sector.



Source: JET

Figure 2.2-6 Ten-year spatial development plan for mining and other industrial sectors

(3) Twenty-year spatial development plan

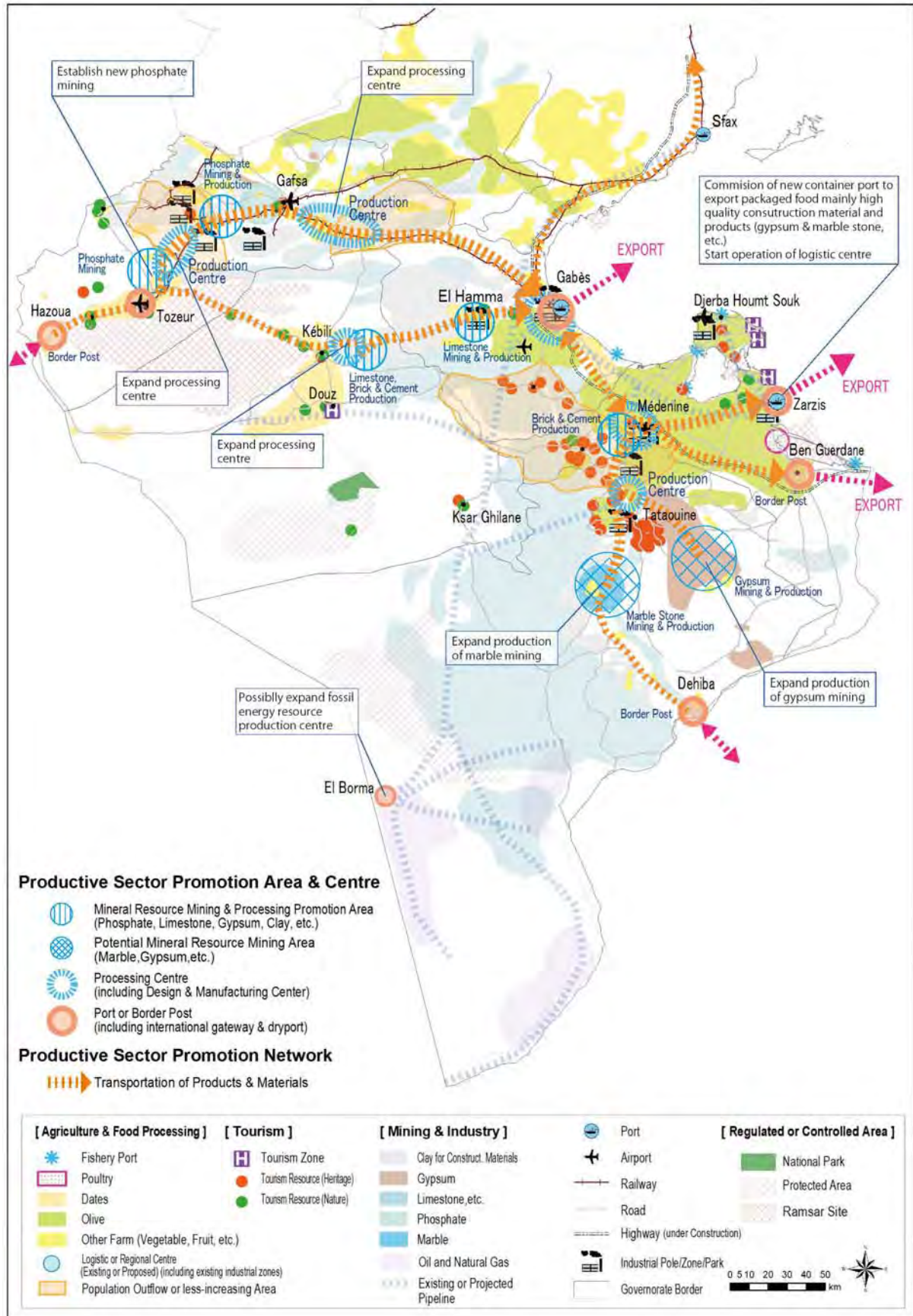
(a) Outline of the development

Due to the completion of the new container port development in Zarzis, export of products will be able to be effectively segregated between chemical based bulk export and construction material (marble stone, limestone, gypsum products, etc.) based container export. Export to Libya and Algeria will be made in smaller amount from the regional processing centres directly through the border service centre. Mining production, especially, in Tataouine and Kébili, is planned to be further developed for larger amount so that the production clusters and processing centres should be well upgraded. Logistic services developed in Gabès and Médenine, for instance, are also to be expanded with improved facilities. Expansion of pipelines from the fossil energy resource production zone to all over the region is to be realized, and special resource distribution may be considered to improve the livelihood in the Southern Region. For the world market demands, more design oriented or mass production of construction materials may be required; therefore, a concentrated processing centre of construction materials, such as marble stone, limestone and gypsum products is planned to be established in the production clusters for more effective value chain set-up considering closer proximity to the international ports. According to the productive activities in previously established clusters, more concentrated processing and packaging activities are to be realized in the processing centres of production clusters considering best exporting method and location.

(b) Key development

- Construction of Zarzis container port with bulk port facility upgrade should be completed earlier in this period for operation.
- New mining field for phosphate ore production in Tozeur are to be established for operation.
- Processing centres in Gafsa and Tozeur have to be expanded for larger production volume.
- Processing centre in Kébili is to be expanded for larger production of construction materials.
- Marble stone mining area in Tataouine is to be expanded, and more sophisticated product design will be introduced for manufacturing, utilizing R&D centre activity.
- Gypsum and limestone production zones are to be expanded further in Tataouine.
- Possible expansion of gas pipeline is expected to be considered based on the central government development policy and facilities for local LPG distribution or other related services are to be developed.
- Production cluster and processing centres are to be strengthened for larger industrial and exporting activities.
- Networking between production clusters and selected ports is to be strengthened for more effective exporting activities and services.

Figure 2.2-7 illustrates twenty-year spatial development plan in this sector.



Source: JET

Figure 2.2-7 Twenty-year spatial development plan for mining and other industrial sectors

2.2.5 Spatial plan for tourism sector

This sector has a unique development concept for improving or establishing destinations with three common groups: destination “Bleu-Mediterranee”, which utilises the Mediterranean as its beach tourism resources; destination “Terre-Berber,” which utilises mainly cultural heritage such as archaeological sites of Ksar; and destination “Rose-Sahara,” which utilises Sahara and oasis as tourism resources. There are clusters of such potential tourist attracting sites in several locations in the Southern Region, and individual sites in the cluster will be connected by local circulation network. While small attraction sites are connected by the local circulations, these destination clusters should be effectively connected by large regional transportation network to help tourists to experience these clusters conveniently. Transport network will also be connected to the major airports and seaports for providing more options to the tourists.

Based on the analysis of population change in the previous years, it is identified that there are several locations in the Southern Region where population has decreased or minimally increased. These areas are located in western part of Gafsa or hilly areas in Médenine and Gabès. Some of the tourist destinations identified in the sector development strategy is either overlapping or located near these population outflowing areas. Thus, the development strategy should look into the possibility of the area oriented development phases, so that the tourist destination development and its activities may create job and have positive impact on the economic activities in such areas having difficulties in increasing their population.

(1) Five-Year Development Strategy

(a) Outline of the Development

During this period, initial infrastructure necessary for regional tourism development, especially for economic development in inland areas, will be installed as a priority.

(b) Key Development

- Improvement of rural roads in inland area, particularly in vulnerable delegations in mountain area in Médenine, Gabès and Tataouine governorates

Figure 2.2-8 illustrates first five year spatial development plan in the tourism sector.

(2) Ten-Year Development Plan

(a) Outline of the Development

After installing initial infrastructure necessary for regional development, creation of local tourist circulations inside the destinations and upgrade of inter-connections between destinations will be required.

(b) Key Development

- Create local tourist circulations inside the destinations
- Upgrade inter-connections between destinations

Figure 2.2-9 illustrates ten-year spatial development plan in this sector.

(3) Twenty-Year Development Strategy

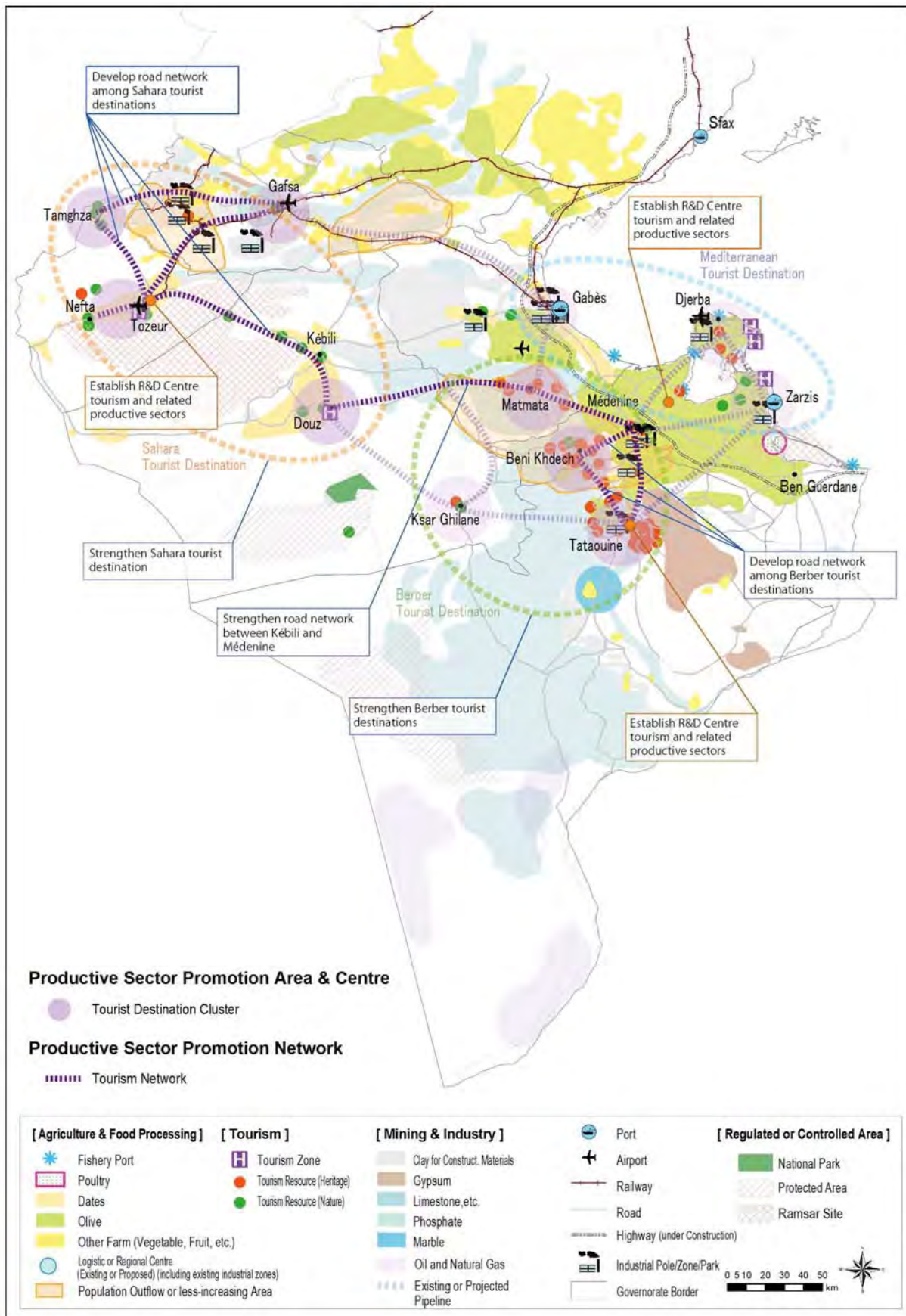
(a) Outline of the Development

Improvement of airport facilities of the Djerba and Tozeur international airports will be also required to improve passenger service.

(b) Key Development

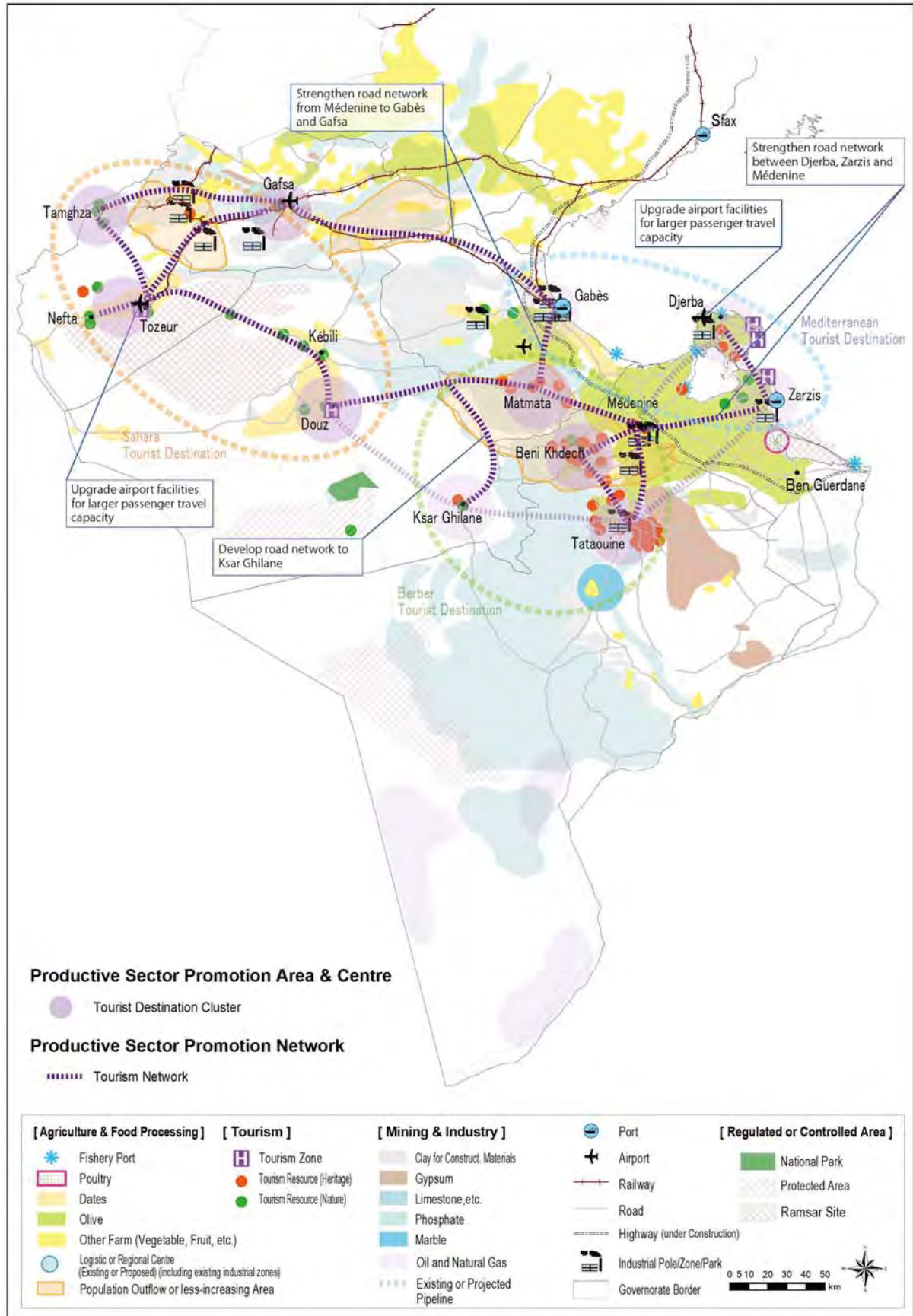
- Improvement of airport facilities of the Djerba and Tozeur international airports

Figure 2.2-10 illustrates twenty-year spatial development plan in this sector.



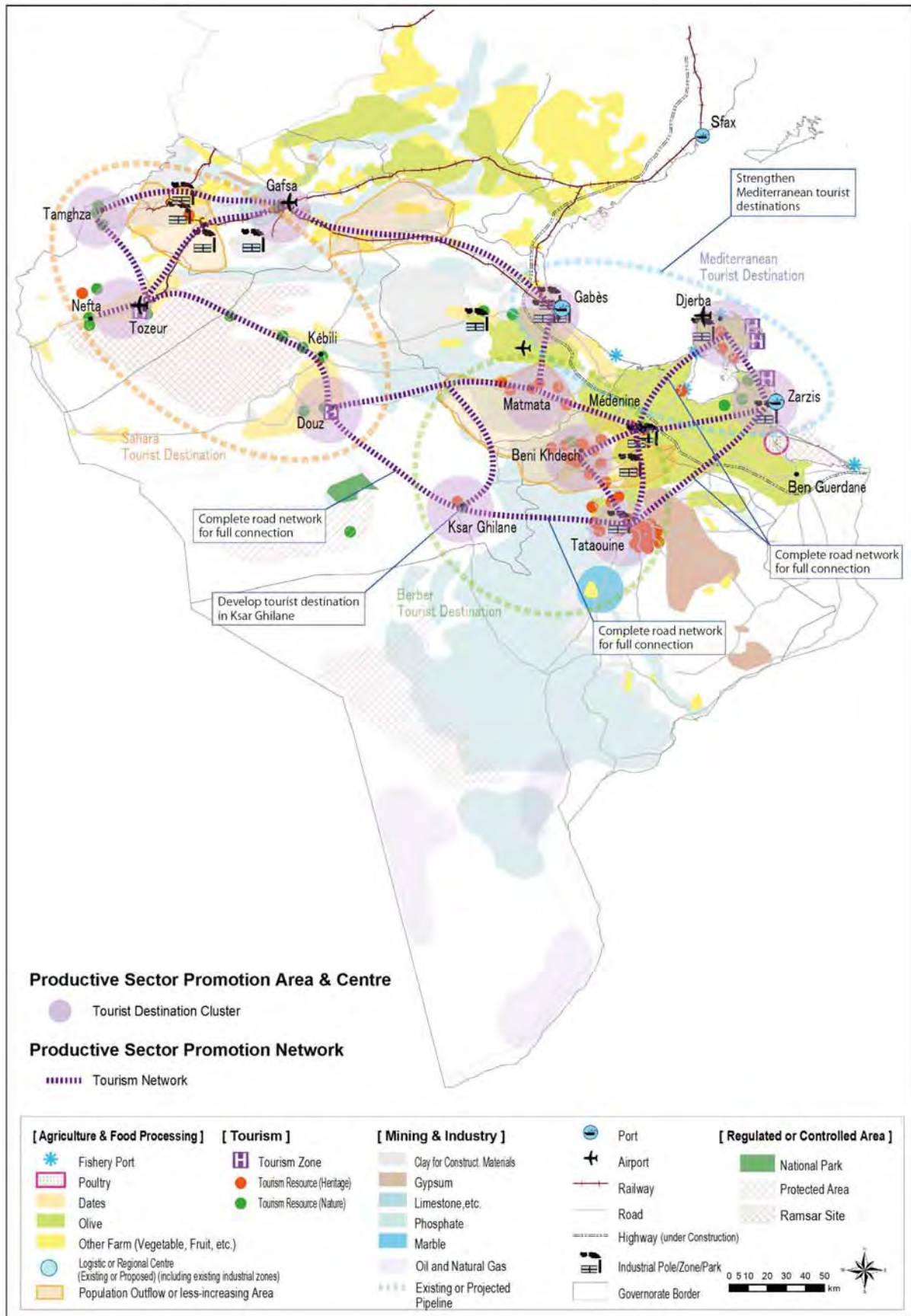
Source: JET

Figure 2.2-8 Five-year spatial development plan for tourism sector



Source: JET

Figure 2.2-9 Ten-year spatial development plan for tourism sector



Source: JET

Figure 2.2-10 Twenty-year spatial development plan for tourism sector

2.2.6 Overall sector integrated spatial plan

It is important to reduce economic disparity within the Southern Region as well as between the south and the rest of Tunisia. Analysis by JET on economic disparity in Southern Region has indicated that the South-west Region, namely Tozeur, Kébili and Gafsa, has difficulty to get access to jobs (employment). Thus, job creation effort should be effectively made in these areas through the productive and tourism sector development. Power generation utilising renewable energy will mainly be promoted in these dry areas with more than three hundred sunny days per year.

A part of the South-east Region, namely Tataouine, has also suffered from high unemployment rate although the governorate has large potential of mineral resource use and production including petrol and gas productions. However, there is only small scale production of gypsum by the private sector at present, and wider development in the mineral sector is necessary for economic development of the governorate. Although the government leads oil and gas production and related plans existing in Tataouine, these plans do not have direct impacts on the Tataouine economy as well as the Southern Region economy as oil and gas development projects are undertaken by foreign specialised companies with licenses granted by the central government authority. Strategies should be developed in consultation with the central government so that the Southern Region may obtain better benefits.

Because of limited capacity in production and processing in most products coming from the region, large-scale logistic centre may not be necessary in the short-term period. Production areas for primary productive sector and Processing Centres with factories or companies will be developed at existing or projected industrial poles/zones (some are named as Techno-Pole).

The followings are production/processing centre development considered for each of the six governorates in the South Region. Although the production of a variety of handicraft and its commercialisation are planned to be promoted over all Southern Region utilising local assets of traditional skills and designs, the sector development is not listed below for each of the six governorates. Though the development of various promising agricultural products, such as pomegranate in Gabès, Potatoes in Tataouine, or vegetable in Gafsa, etc., is proposed, they are also not listed below.

Gafsa

- Phosphate mining and its Processing Centre
- Processing Centre for new product, such as cosmetics, textile, etc.
- Production of mineral resources and Processing Centre for construction materials
- Processing Centre for poultry industry
- Tourist Destinations (Tamghza and Gafsa)
- Power generation with renewable energy
- Product Distribution Centre for mainly agricultural products transported between north, central and south Tunisia as well as to Algerian cities west of Tozeur
- R&D Centre (agriculture and mineral resources)

Tozeur

- Oasis Agriculture mainly for dates production
- Production of greenhouse vegetable

- Processing Centre for dates
- Processing Centre for poultry industry
- New phosphate mines (considered in long term development) Processing Centre for new products, such as part assembly, cosmetics, textile, etc.
- Sahara Tourist Destinations (Tozeur) Power generation with renewable energy
- Border Post (at Hazoua)
- R&D Centre (agriculture and tourism)

Kébili

- Oasis Agriculture mainly for dates production
- Processing Centre for dates
- Production of mineral resources and Processing Centre for construction materials including limestone processing
- Production of greenhouse vegetable Sahara Tourist Destinations (Douz and Ksar Ghilane)
- Power generation with renewable energy
- R&D Centre (agriculture and mineral resources)

Gabès

- Regional Development Pole for chemical industry, food processing (dairy products, red meat processing and packaging) and logistic function
- Southern Region International Trading Port (mainly bulk)
- Production and Processing Centre for construction materials including limestone (El Hamma)
- Production of greenhouse vegetable
- Mediterranean Tourist Destination (Gabès)
- Berber Tourism Destination (Matmata)

Médenine

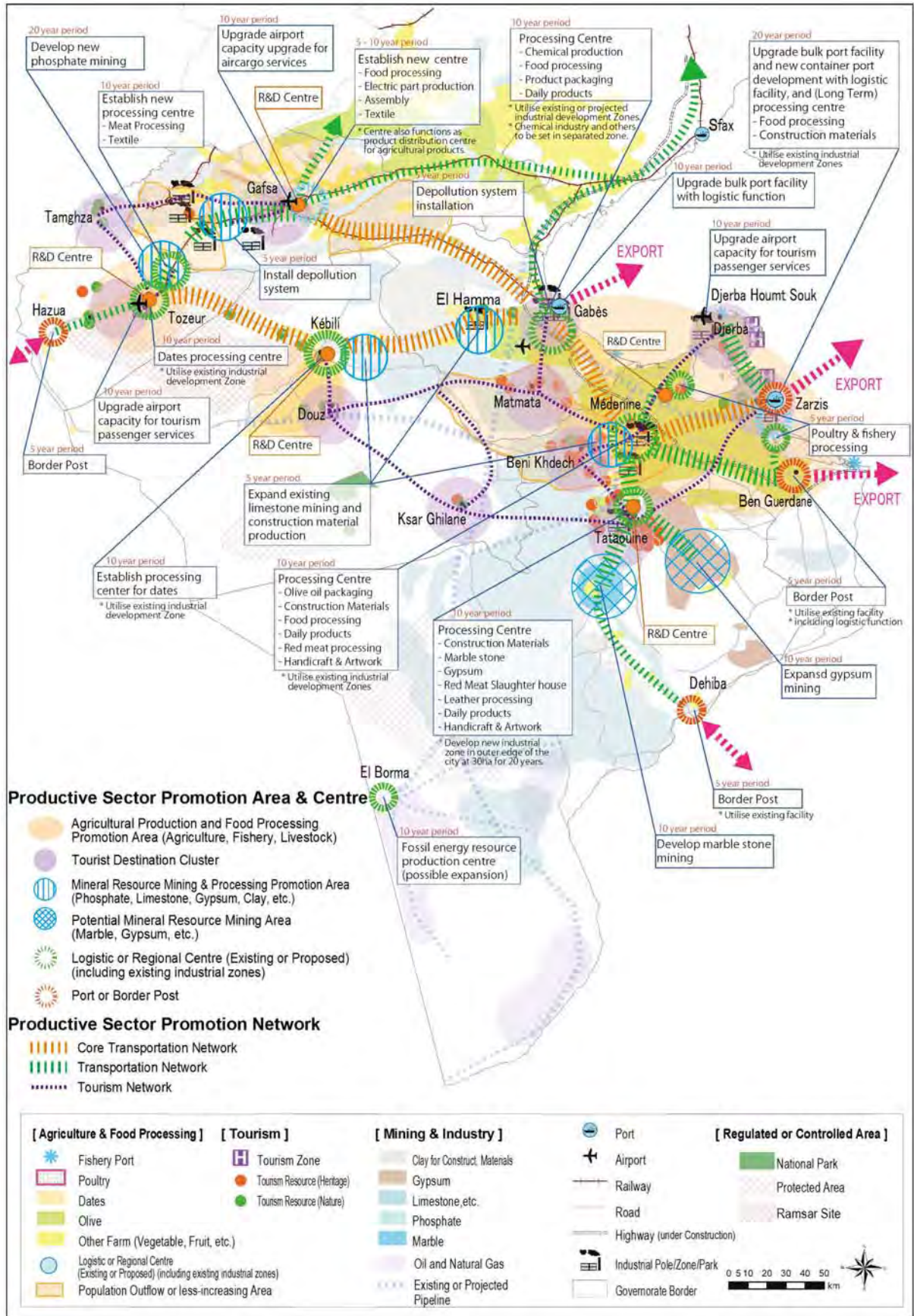
- Regional Development Pole for food processing (olive products, dairy products, fish products, red meat processing and packaging), construction materials, leather processing and logistic function
- International Container Port with upgraded bulk port (Zarzis)
- Processing Centre for poultry industry (south of Zarzis)
- High Quality and Value-Added Processing Centre for Olive and Date products in Zarzis for world market demands in the long-term period.
- Fishery Production and Processing Centre (Djerba and Zarzis)
- Mediterranean Tourist Destinations (Djerba and Zarzis)
- Berber Tourist Destination (Beni Khdech)
- R&D Centre (agriculture and tourism)

Tataouine

- Production of mineral resources (marble stone, limestone and gypsum mainly) and Processing Centre for construction materials
- Processing Centre for dairy products, red meat (slaughter house), cosmetics and leather products
- Production of greenhouse vegetable
- Berber Tourist Destinations (Tataouine)
- Potential service development for the natural gas exploitation
- R&D Centre (agriculture and mineral resources)

Figure 2.2-11 illustrates overall spatial development plan for the Southern Region.

There are a few land use regulations based on the international treaty or based on the environmental protection regulation. Chott el Jerid between Tozeur & Kébili and a part of Boughrara Gulf and Bahiret el Bibane are designated as Ramsar Convention Protected Wetland. Thus, these wetlands will not be developed under the planning by the Project. Other than the Ramsar sites, Tunisian government has designated several lands as national park or protected land, and use of these lands is to be properly regulated and controlled so the they will not be negatively affected by the implementation of the regional development.



Source: JET

Figure 2.2-11 Spatial development plan for the Southern Region

2.2.7 Spatial development based on the development scenario

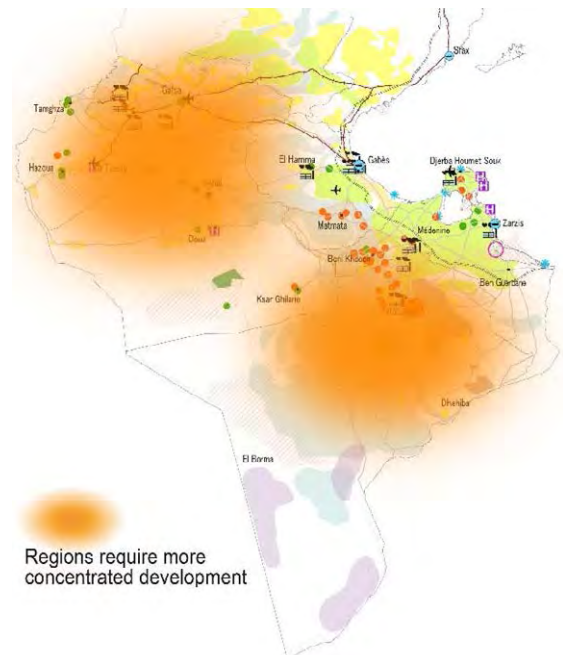
(1) Development balance in the Southern Region

Regional development in the Southern Region should focus on priority of development in the areas where higher disparity among the region is observed. Therefore, productive sector development should be implemented in the west and south part of the Southern Region, namely Tozeur, Gafsa, Kébili and Tataouine.

Currently in the region, production chain and value chain is weak and the main productive activities are limited to those of the primary sectors, such as agriculture, fishery and mining, while high value adding processing and the exporting are carried out in northern and central eastern Tunisia or even in European countries. Through the development strategies and plans for the Southern Region development, such high value adding processing and the exporting are to be shifted within twenty-year period to the Southern Region being managed by the regional and local people and entities. Figure 2.2-12 illustrates development balance in the Southern Region.

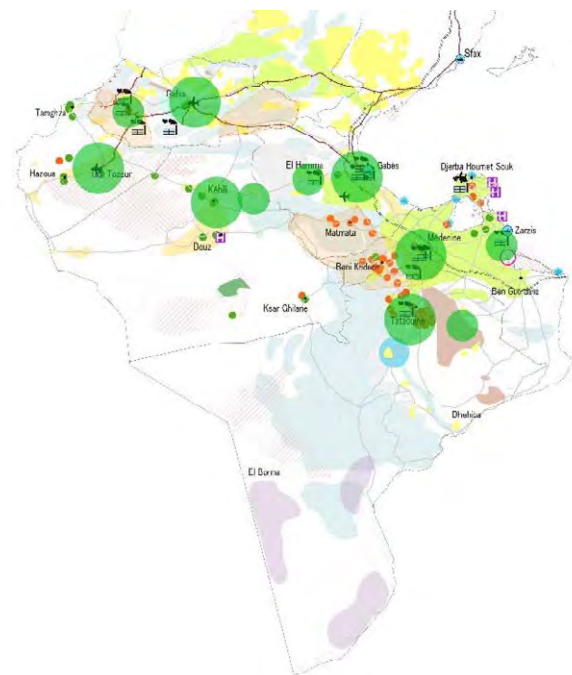
(2) Productive sector and activity distribution in the short to mid-term

According to the development balance in the Southern Region, each governorate will develop its own products and productive sector development including tourism destinations. Most agricultural products are spread over the areas in each governorate; however, the processing centres of these products will be concentrated in their local centres such as governorate capitals. Mining sectors are located outside the city areas so that many of these resources production and processing, such as construction materials, will be further developed at the existing sites. Most products are expected to be processed locally for export or delivery to the markets by the medium-term period (2021-25). Figure 2.2-13 illustrates production activity distribution in the short- to medium-term periods in the Southern Region.



Source: JET

Figure 2.2-12 Priority development areas in the Southern Region

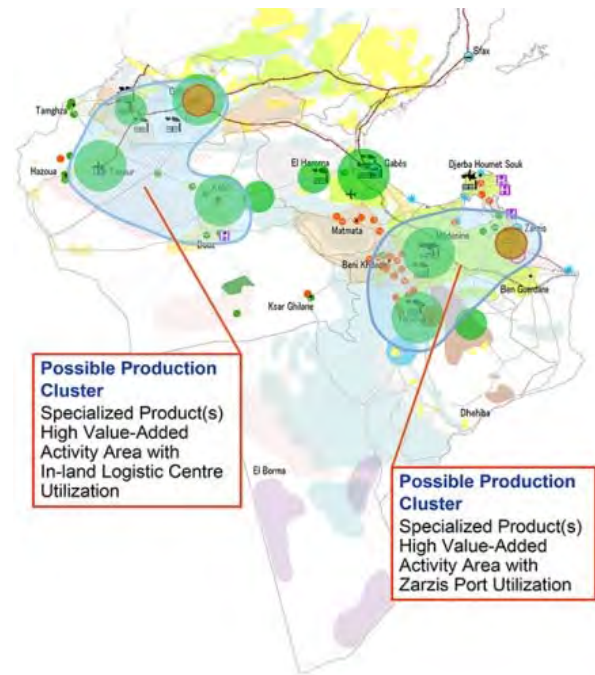


Source: JET

Figure 2.2-13 Short- to medium-term development activity distribution in the Southern Region

(3) Productive sector and activity distribution in the long term

After the major shift of product transportation or export from the northern region to the Southern Region, distribution of each product should be also centralized from the port of Zarzis with some particular products from Gabès. Besides, products for domestic or Libyan/Algerian market consumptions will be continuously transported directly from each processing centres to the destinations. If the demand of the international markets, such as those in Europe and the US, is high for quality and high value-added products in quantity or volume), some of these major products are better be concentrated in the special processing centre(s) of the production cluster(s) based on the particular local products. The world class high quality and value-added products with brand packaging will be manufactured in such locations near the export points such as Zarzis for effective and efficient export to the profitable market. Figure 2.2-14 illustrates production activity distribution in the long-term period.

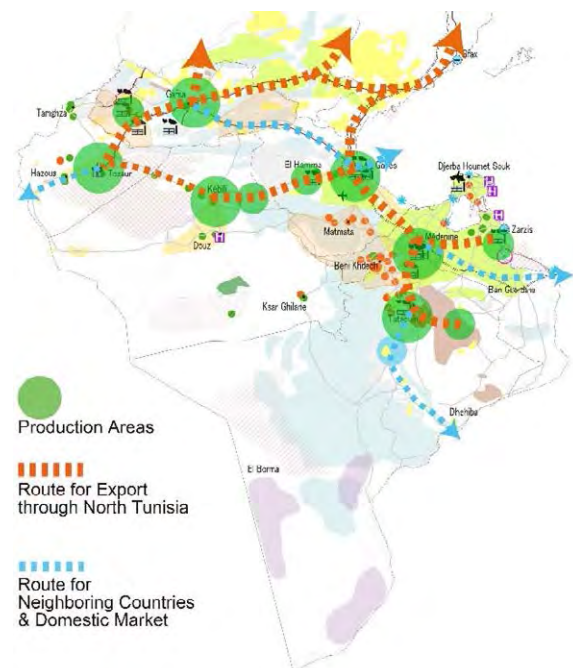


Source: JET

Figure 2.2-14 Long-term development activity distribution in the Southern Region

(4) Product flow in the short-term, the medium- and long-term period

As product processing centres are to be developed in each governorate during the short-term period, while the export to major markets is still managed in Sfax or northern Tunisia, the flow of most products should move towards north or Sfax, although the processing activities should be gradually shifted from the north to the south. The trading with Libyan and Algerian markets is expected to start increasing, according to the preparation of border posts in the region. Figure 2.2-15 illustrates product flow during the short-term period in the Southern Region. Each product will be processed and packaged locally each governorate for distribution through the existing road or rail network to Sfax, northern Tunisia. Therefore, major transportation flow tends to move to the north direction except some bound for Libya and Algeria. Centralized export from the Southern Region itself will not start during the short-term period.



Source: JET

Figure 2.2-15 Product flow in the short-term period of the Southern Region Development

Once the container port of Zarzis is completed for operation in the long-term period of development, full shift of the exportation of regional products will take place. Therefore, large amount of transportation of goods and products from the west region to Gabès and Médenine as well as from Tataouine to Gabès and Médenine will take place in larger volume. Figure 2.2-16 illustrates product flow in the long-term period in the Southern Region.

Product distribution from the Southern Region to the north of Tunisia will become secondary as Zarzis container port becomes regional central trading port in the long-term period. Major product distribution activities for even domestic and Libyan markets will be handled through the product based clusters, centres and logistic networks in the region, although major production and processing activities will be still made in each governorate. For Algerian market, the production cluster of Tozeur and Gafsa with Kébili logistic network may function as well.



Source: JET

Figure 2.2-16 Product flow in long-term period of the Southern Region Development

2.2.8 Basis of infrastructure development

The cities of Gabès and Médenine, as gateways to the global markets from the Southern Region, should be equipped with production centres with logistics function and facility. The capacity of Gabès port is planned to be upgraded, and the Zarzis port is to be expanded as a new container port with bulk port facility. Ben Guerdane is to be upgraded with larger border post and store service facilities for expanded Libya trading. Dehiba, Tataouine and Hazoua, Tozeur are to be developed as secondary border posts for the expected trading with Algeria and Libya. Existing facilities are to be utilised for upgraded and suitable function.

The important action considered is to install de-pollution systems in Gabès and Gafsa industrial zones in order to improve the damaged environment. According to the development of production centres in Gabès and Médenine, the water supply, waste water treatment and power supply services should increase gradually with the development of economy and society. Due to decrease in phosphate production expected in Gafsa, Tozeur will become next phosphate production centre to maintain the supply to the chemical industry; thus, the upgrade of infrastructure, especially transport, will be necessary. Tataouine also expects large development in mineral resource production in its part; therefore, the upgrade of infrastructure will be necessary when these mining sites become operational together with the processing centre in Tataouine.

Agricultural sector development needs alternative options for more effective production of dates, for instance, and water supply system should provide sufficient water as well as have sufficient distribution network. Greenhouse agricultural products, such as tomato and paprika, for seasonal production and export to European countries are considered as a potential industry utilising geothermal resource if

available. Therefore, particular infrastructure should be properly provided to this production sector. Other than the existing fishery industry, shrimp, shellfish and fish farming will be developed at Zarzis and Djerba area, so necessary infrastructure should be prepared for higher quality control, especially the freshness of the products.

Textile industry will be established in Gafsa and Tozeur for large job creation, but the locations are far from the coast area. The aimed industry is seeking high value-added production and processing for higher economic return, and such business scheme may require air-cargo shipping or fast and constant freight train services to the port (mainly to container port). Thus, related existing infrastructure should be well planned for upgrade.

According to the tourism development, there are several new roads or upgrade of roads required; however the demand from the tourism sector may not be so high compared to freighter transport for promotion of other productive sectors. Thus, other major road network may be substituted for the tourism oriented transportation network. When the development takes place in western region as well as the mountain region for earlier job creation in the sector activities, infrastructure development, mainly for road development, should also be concentrated in the same areas of the Southern Region. Airports in Tozeur and Djerba are to be upgraded for better passenger service with some possible cargo shipping in the region. Railway network will be upgraded and extended mainly for freight transport; however this facility may also be utilised for tourist attractions.

The following tables indicate the sector based product volume considered in the Southern Region development in the long-term.

2.2.9 Development of processing centres (industrial zones)

As shown in Table 2.2-1, there would be enough areas for processing centres (industrial zones) in the Southern Region with an exception of Tataouine Governorate. In addition to the areas for processing centres shown in the table, 155 ha of land is being prepared in Médenine Governorate for industrial use.

In case of Tataouine, there remain only 13 ha of land available for industrial purposes. It is necessary for Industrial Land Agency (AFI-Agence Foncière Industrielle) to prepare land immediately for industrial use because land acquisition in the governorate will be difficult due to small or common land ownership. It is proposed to the AFI to prepare 10 ha land in the short-term, by 2020. After 2026 when the cluster development reaches the development stage, additional 20 ha of lands will be required. As a cluster for processing useful substances to construction materials is planned to be developed in the governorate, occurrence of dust pollution has to be examined carefully at the time of the processing centre site selection.

For other governorates, the existing lands prepared for industrial purposes would be enough for development of processing centres or for cluster development. Only infrastructure development within the estates will be required.

Table 2.2-2 Sector based Product Volume in the Southern Region Development: Gafsa

Sector	Roles in Development	Core Area/City	Particular Products	Processing Area / Place	Domestic Market (T: ton)	Oversea Market	Algerian/Libyan Market	Required Process Area (ha)	Required Water (m ³)	
Mining	Phosphate Mining and Processing	Gafsa Area	Phosphate	Gafsa / Gabès (existing)		0.2MT, Almost 100%		None		
			Processing products of phosphate	Gafsa Suburban Area		2,000T, Almost 100%		5		
Industrial	Construction Materials, Textile & Cosmetics Processing	Gafsa Area	Marble Stone	Gafsa Suburban Area	4,000T, 40%	4,000T, 40%	2,000T, 20%		2	
			Limestone	Gafsa Suburban Area	5,000T, 50%	5,000T, 50%			3	
			Textile	Gafsa Suburban Area	2,000T, 20%	7,500T, 80%	500T, 5%		10	
			Cosmetics	Gafsa Suburban Area	40T, 20%	180T, 80%			2	
Agriculture	Preparation of Logistic Facility for transportation of agricultural products and processed products to north and central Tunisia and Algeria	around Gafsa City	Olive (oil)	Gafsa Suburban Area	20%, 600t	80%, 2,400t		primary mill: 2ha (distributed) bottling: 0.5ha	6,000m ³ (mainly for primary mill)	
			Dates	Gafsa Suburban Area	25%, 3,000t	75%, 9,000t	0%(Libya)		1	16,000m ³
Agriculture	Livestock Breeding and Red Meat Processing	all over Governorate	Red Meat	Gafsa Suburban Area	80%, 1,840t		20%, 460t		0.5	3,300m ³
			Milk & Dairy Products	Gafsa Suburban Area	80%, 80,000t		20%, 2,000t		1	120,000m ³
Tourism	Tourism Destination Development (Rose - Sahara)	Gafsa Area								
Common	Research and Development, Incubation Centre Development (agriculture, agro-processing, mining resources, construction materials)	Gafsa City								
Total Ha.								27		

Source: JET

Table 2.2-3 Sector based Product Volume in the Southern Region Development: Tozeur

Sector	Roles in Development	Core Area/City	Particular Products	Processing Area / Place	Domestic Market (T: ton)	Oversea Market	Algerian/Libyan Market	Required Process Area (ha)	Required Water (m ³)	
Agriculture	Dates Production and Processing	Tozeur Area	Dates	Tozeur Suburban Area	25%, 17,500t	75%, 52,500t	0%(Libya)	3	105,000m ³	
Agriculture	Promotion of Oasis Agriculture	all over Governorate		Tozeur Suburban Area	%	%	%			
Mining	New Development of Phosphate Mining	Tozeur Area		North Tozeur (Future only)						
Industrial	Textile and Cosmetics Processing	Tozeur Area	Textile	Tozeur Suburban Area	300T, 20%	1,200T, 80%			2	
			Cosmetics	Tozeur Suburban Area	70T, 30%	150T, 70%			2	
Agriculture	Greenhouse Vegetable Production	all over Governorate	Greenhouse Vege.	Large Tozeur Area	40%, 2,800t	60%, 4,200t	20%, 1,400t			
Agriculture	Livestock Breeding and Red Meat Processing (mainly broiler)	all over Governorate	Red Meat	Tozeur Suburban Area	80%, 1,600t		20%, 400t		1	2,400m ³
Tourism	Tourism Destination Development (Rose - Sahara)	Tozeur, Nefza, Tamghza, Mides Chebike								
Common	Regional Border Development	Hazua								
Common	Research and Development, Incubation Center Development (agriculture main)	Tozeur Area								
Total Ha.								8		

Source: JET

Table 2.2-4 Sector based Product Volume in the Southern Region Development: Kébili

Sector	Roles in Development	Core Area/City	Particular Products	Processing Area / Place	Domestic Market (T: ton)	Oversea Market	Algerian/Libyan Market	Required Process Area (ha)	Required Water (m ³)	
Agriculture	Dates Production and Processing	Kébili Area	Dates	Kébili Subrub Area & Douz	25%, 57,500t	75%, 112,500t (including conditioning out of Kébili)	%(Libya)	5ha (excluding conditioning out of Kébili)	112,500 m ³ (excluding conditioning out of Kébili)	
Agriculture			Red Meat	Kébili Subrub Area & Douz	0%	0%	0%			
Agriculture	Promotion of Oasis Agriculture	all over Governorate		Kébili Subrub Area & Douz						
Tourism	Tourism Destination Development (Rose-Sahara)	Kébili, Douz, Ksar Ghilane								
Industrial	Construction Materials Processing	Kébili Area East	Limestone	East of Kébili City	6,000T, 30%	14,000T, 70%			5	
	Cosmetics	Kébili Area East	Cosmetic Products	East of Kébili City	30T, 30%	90T, 80%			2	
	Textile	Kébili Area East	Textile Products	East of Kébili City	100T, 20%	400T, 80%			1	
Agriculture	Greenhouse Vegetable Production	all over Governorate	Greenhouse Vege.	Large Kébili Area	40%, 4,000t	60%, 6,000t	10%, 1,000t			
Common	Research and Development, Incubation Center Development (agriculture, agricultural processing, mining resources, construction materials)	Kébili Area								
							Const. Materials	Total Ha.	5	around Kébili
							Agri. & Others	Total Ha.	8	Kébili East

Source: JET

Table 2.2-5 Sector based Product Volume in the Southern Region Development: Gabès

Sector	Roles in Development	Core Area/City	Particular Products	Processing Area / Place	Domestic Market (T: ton)	Oversea Market	Algerian/Libyan Market	Required Process Area (ha)	Required Water (m ³)	
Common	Preparation of Regional Development Pole - Processing Base (chemical industry, food processing (dairy products, fishery, red meat), textile, packaging) - Logistic Base	Gabès	Chemical (Bulk)	Existing Processing Site	%	%	%			
			Chemical (Container)	Existing Processing Site	%	%	%			
			Red Meat Processing	South of Gabès City	80%, 5,240t		20%, 13,100t		1	36,680m ³
			Dairy Products & Milk	South of Gabès City	80%, 24,000t		20%, 6,000t		1	30,000m ³
			Fishery Processing	South of Gabès City	50%, 4,000t	50%, 4,000t		0%	1	16,000m ³
Industrial	Construction Materials Processing	El Hamma	Limestone	El Hamma Area	15,000T, 30%	35,000T, 70%				
			Marble Stone	Gabès Suburban Area	3,000T, 15%	14,000T, 70%	3,000T, 15%			
	Phosphate Processing	Gabès and El Hamma	Phosphate	Existing Processing Site		2.6MT, Almost 100%		None		
			Processing Products of Blau	Gabès Suburban Area		22,000T, Almost 100%			12	
			Cosmetics	Gabès Suburban Area	40T, 20%	180T, 80%			2	
Textile	Gabès	Textile Products	Gabès Suburban Area	600T, 20%	2,400T, 80%			3		
Agriculture	Olive oil	Gabès	Olive oil		20%, 600t	80%, 2,400t		primary mill: 2ha (distributed) bottling: 0.5ha	6,000m ³ (mainly for primary mill)	
	Dates	Gabès	Dates		25%, 9,500t	75%, 29,500t			3	
	Greenhouse Vegetable Production	places with thermal water resources		West of Gabès City and Larger Area	40%, 24,000t	60%, 36,000t	0%			
Tourism	Tourism Destination Development (Bleu - Méditerranée, Terre - Berbère)	Gabès, Matmata								
Common	Development (expansion) of International Port (Gabès Port: Bulk port facility expansion, new container facility)	Gabès								
							Const. Materials	T total Ha.	12	El Hamma & West of Gabès City
							Agri. & Others	T total Ha.	13.5	South of Gabès City

Source: JET

Table 2.2-6 Sector based Product Volume in the Southern Region Development: Médenine

Sector	Roles in Development	Core Area/City	Particular Products	Processing Area / Place	Domestic Market (T: ton)	Oversea Market	Algerian/Libyan Market	Required Process Area (ha)	Required Water (m ³)	
Common	Preparation of Regional Development Pole - Processing Base (food processing (olive products, dairy products, fishery, red meat), packaging) - Logistic Base	Médenine	Olive (Oil)	Zarzis Port Area	20%, 3,000t	80%, 12,000t	0%	primary mill: 10ha (distributed) bottling: 1ha	30,000m ³ (mainly for primary mill)	
			Red Meat	Médenine Suburban Area	80%, 7,200t		20%, 1,800t			2
			Dairy Products & Milk	Médenine Suburban Area	80%, 3,200t		20%, 800t			1
			Fishery Products	Zarzis Port Area	20%, 400t	80%, 1,600t	0%			0.5
Dates Processing	Dates from Tozeur, Kébilli & Gafsa (Special Case)	In case feasible	Dates (Process+Package)	Zarzis Port Area		50%, 50,000t		5	100,000m ³	
Agriculture	Agricultural and Fishery Processing (mainly fishery and livestock meat)	Djerba, Zarzis	See Above							
Const. Materials	Const. Materials	Zarzis	Marble Stone	Médenine & Zarzis Area	1,000T, 5%	18,000T, 90%	1,000T, 5%		3	
		Zarzis	Limestone	Médenine & Zarzis Area	20,000T, 30%	50,000T, 70%			8	
		Zarzis	Gypsum (Container)	Médenine & Zarzis Area	1,000T, 5%	22,000T, 88%	2,000T, 8%		2	
		Zarzis	Cosmetic Products	Médenine & Zarzis Area	100T, 30%	250T, 70%			3	
		Zarzis	Processing Products of bla	Médenine & Zarzis Area		60,000T Almost 100%			6	
	Textile	Médenine	Textile Products	Médenine & Zarzis Area	2,000T, 20%	7,500T, 80%	500T, 5%		7	
Tourism	Tourism Destination Development (Bleu - Méditerranée, Terre - Berbère)	Djerba, Zarzis, Beni Khédach								
Common	Development (expansion) of International Port (Zarzis Port: new container facility, bulk port expansion)	Zarzis								
Common	Existing Research and Development, Incubation Center Utilization (mainly agriculture, agricultural processing)	Médenine east, Zarzis								
							Food & Textile	Total Ha.	10	around Médenine City
							Const. Material, Cosme	Total Ha.	30	Zarzis

Source: JET

Table 2.2-7 Sector based Product Volume in the Southern Region Development: Tataouine

Sector	Roles in Development	Core Area/City	Particular Products	Processing Area / Place	Domestic Market (T: ton)	Oversea Market	Algerian/Libyan Market	Required Process Area (ha)	Required Water (m ³)	
Industrial	Development of Production Base for construction materials (Marble stone, Gypsum, etc.)	Tataouine Area	Gypsum (Bulk)	East of Tataouine City	%	760,000, 95%	40,000T, 5%		8	
			Gypsum (Container)	East of Tataouine City	10,000T, 8%	10,000T, 77%	2,000T, 15%		2	
			Limestone	East of Tataouine City	6,000T, 20%	24,000T, 80%			5	
			Marble Stone	South of Tataouine City	5,000T, 10%	40,000T, 80%	5,000T, 10%		6	
			Cosmetics	Tataouine Area	Cosmetic Products	Tataouine Suburban Area	60T, 30%	160T, 70%		
	Textile	Tataouine Area	Textile Products	Tataouine Suburban Area	100T, 20%	350T, 70%	50T, 5%		1	
Agriculture	Agricultural Product Processing (red meat, leather products, cosmetics products)	Tataouine Area	Red Meat Processing	Tataouine Suburban Area	80%, 2,400t		20%, 600t		1	4,500m ³
			Olive oil	Tataouine Suburban Area	20%, 600t	80%, 2,400t	0%	primary mill: 2ha (distributed) bottling: 0.5ha	6,000m ³ (mainly for primary mill)	
			Dairy Products	Tataouine Suburban Area	%	%				
			Leather	Tataouine Suburban Area	%	%				
			Cosmetics	Tataouine Suburban Area	%	%				
Agriculture	Green House Vegetable Production	Tataouine Greater Area		Tataouine Large Area	0%	0%	0%			
Tourism	Tourism Destination Development (Terre - Berber)	Tataouine Area								
Common	Regional Border Development	Dehiba								
Common	Research and Development, Incubation Centre Development (agriculture, agricultural processing, mining resources)	Tataouine Area								
							Gypsum & Limestone	Total Ha.	15	Southeast of Tataouine Centre
							Marble Stone	Total Ha.	6	South of Tataouine City
							Agri & Others	Total Ha.	6.5	around Tataouine

Source: JET

CHAPTER 3 DEVELOPMENT STRATEGIES, PLANS, AND ACTION

PLANS FOR THE SOUTHERN REGION

3.1 Structure, composition and coordination of development strategies, plans and action plans

3.1.1 Definitions and structure

Development strategies, plans and action plans are defined as follows:

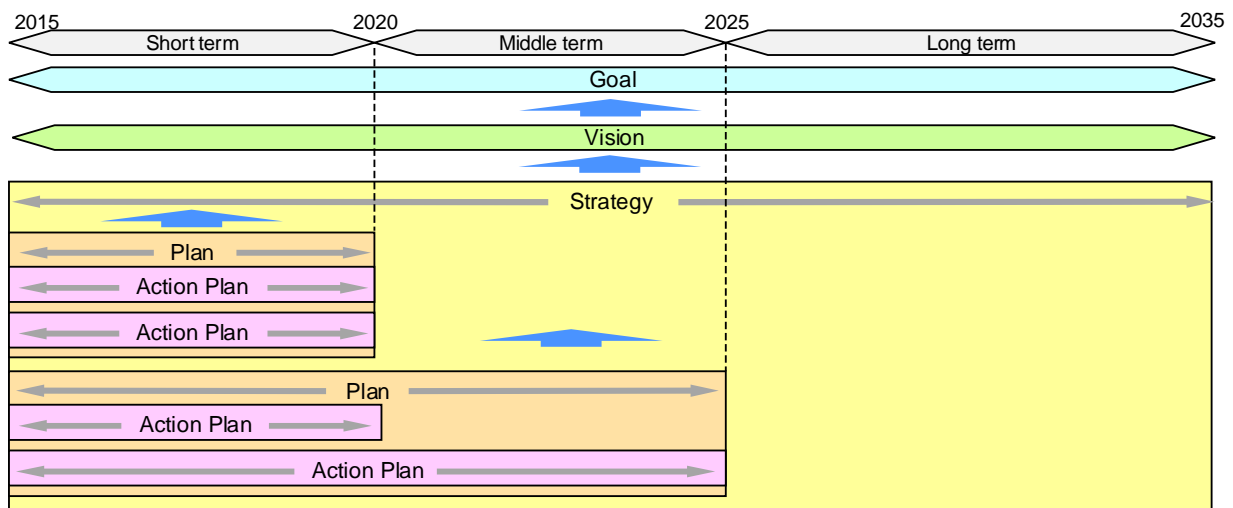
Strategies: necessary measures to be taken during 2015–2035 to realise the development vision

Plans: necessary activities to be taken during 2015–2025 to implement the development strategies

Action plan: necessary actions to be taken during 2015–2025 to promote/support the development plans

The structure of the strategies, plans and action plans is illustrated in Figure 3.1-1. The strategies are to be implemented during 2015–2035, while the plans and action plans are to be carried out during 2015–2020 or 2015–2025. Each strategy generally contains a few or several plans for i) institutional and human capacity development, ii) facility and infrastructure development and/or ii) financial and investment, and each plan comprises of a few or several action plans.

Plans define necessary activities to attain the respective strategies and action plans identify concrete actions to realise respective plans and to be taken by respective organisations in charge. Every organisation in charge of implementing an action plan has to examine the action plan when the organisation formulates a detailed implementation plan referring to respective parts of this report.



Source: JET

Figure 3.1-1 Structure of strategies, plans and action plans

3.1.2 Composition

The development strategies, plans and action plans are composed of those of the following three categories:

- i) Promotion of productive sectors;

- ii) Infrastructure development; and
- iii) Crosscutting issues.

The strategies/plans for promotion of productive sectors include those of the following sectors:

- 1) Agriculture, fishery and agro-fishery processing;
- 2) Mining and other industrial sectors including renewable energy;
- 3) Tourism; and
- 4) Handicraft.

The strategies/plans for infrastructure development comprise the followings:

- a) Transport;
- b) Water supply/wastewater treatment;
- c) Power supply; and
- d) Telecommunications.

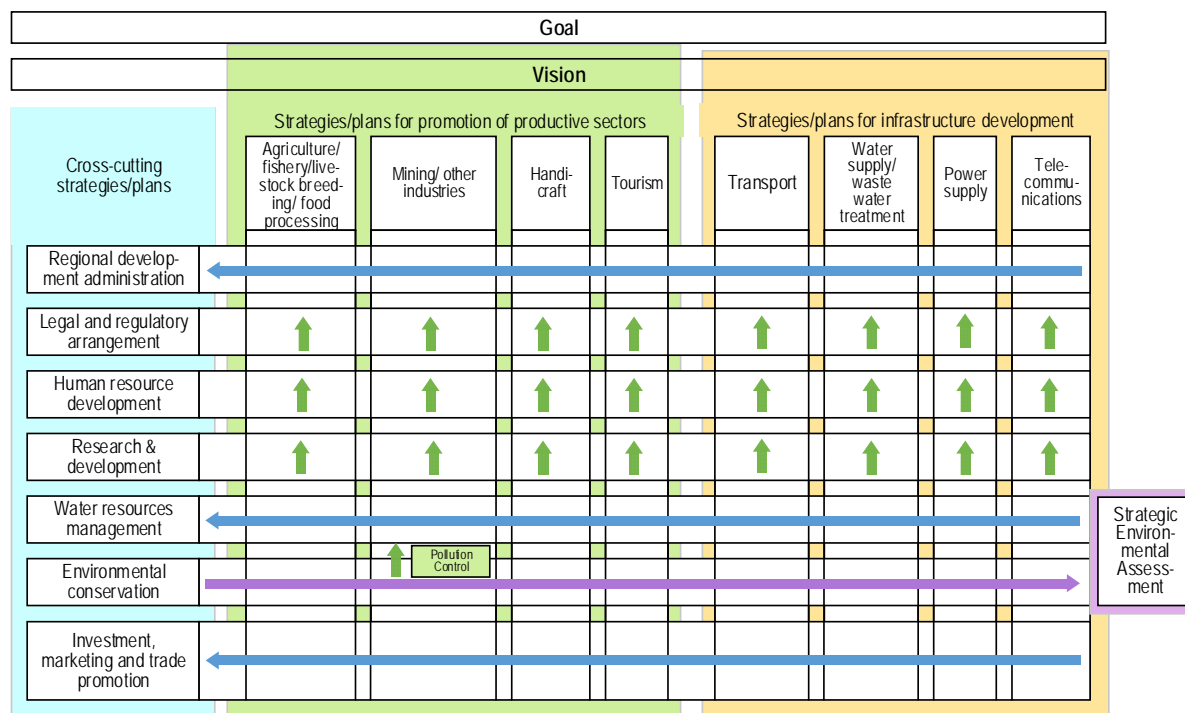
Crosscutting strategies, plans and action plans are composed of those for the followings:

- a) Regional development administration;
- b) Legal and regulatory arrangement;
- c) Human resource development;
- d) Research and development;
- e) Water resources management;
- f) Environmental conservation; and
- g) Investment, marketing, and export promotion.

Strategies, plans and action plans for promotion of productive sectors and those for infrastructure development are described in Section 3.2 and 3.3, respectively, while those on crosscutting issues are described in Section 3.4, except those on 'a) regional development administration', which are presented in Section 3.1.3 of this report since they explain implementation framework of all strategies, plans and action plans of the productive and infrastructure sectors and crosscutting issues .

Strategies, plans and action plans regarding b) legal and regulatory arrangement, c) human resource development, d) research and development are described in respective strategies, plans and action plans of the productive sectors and those for infrastructure development, as the contents of these crosscutting strategies, plans and action plans are heavily dependent on respective sectors, although JET recognises that these crosscutting issues are commonly important for all productive and infrastructure sectors to achieve the development vision and the goal.

Crosscutting strategies/plans for f) environmental conservation and g) land acquisition are described as parts of strategic environmental assessment (SEA), while plans and action plans on pollution control, specifically in the chemical (phosphate) industry, are dealt in the productive sector of b) mining, manufacturing and renewable energy.



Source: JET

Figure 3.1-2 Composition of development strategies, plans and action plans

The crosscutting strategies, plans and action plans highlight essential measures, activities and actions commonly required to effectively and efficiently promote productive sectors, to develop infrastructure, and to achieve the development goal and vision in line with the development scenario under the socio-economic framework as mentioned in Chapter 1 and Chapter 2 of this report. The following are discussed as crosscutting issues:

- a) *Regional development administration:* Roles/functions for planning, implementing, monitoring and evaluating regional development are scattered over various authorities and agencies. To achieve 'higher value-added production', 'job creation' and 'sustainable development', inter-sectoral and inter-governorate integration is quite important. Well-organised coordination mechanism has to be set up to achieve the development vision and goal.
- b) *Legal and regulatory arrangement:* As mentioned in Section 2.1 of this report on the development scenario, the development paradigm of the Southern Region has to change and regulatory reforms as well as new regulatory frames have to be established.
- c) *Human resource development:* Human resource development is the most important factor for the development of the productive sectors towards higher value-adding economy which is competitive. For more job creation, the reform and enhancement of vocational training is necessary.
- d) *Research and development:* Research and development (R&D) is the key to realise higher value-adding productive sectors with prominent competitiveness as well as to diversify the economy of the Southern Region. As many opinions are raised in the public consultation meetings, the enhancement of local research and development is highly required to add high values to the outstanding local resources.

- e) *Water resources management:* Since precipitation is limited in the Southern Region, water resources are scarce and have caused bottlenecks in the development of the productive sectors of the region, especially for agriculture and phosphate related industries. Integrated water resources management is necessary for optimal water use and for preventing over-exploitation of the resources through coordination of various sectors.
- f) *Environmental conservation:* Conventional development patterns of the productive sectors have caused environmental deterioration. Definite countermeasures for environmental conservation are fundamental for the further development of the productive sectors in a sustainable manner as well as for the creation of positive images of the Southern Region to attract prospective consumers, investors and tourists.
- g) *Investment, marketing, and export promotion:* To achieve the goal and vision of the strategies/plans, investment, particularly by the private sector, is essential. As for the public administration, further improvement of business environment and public investment in infrastructure development is required. Export promotion is inevitable since the size of Tunisian domestic market is small. Also, selling/providing goods and services of the region at higher prices is important.

3.1.3 Coordination

(1) Current issues and outline proposals on regional development administration

Current issues on regional development administration as well as outline proposals are described below. Regional development strategies, plans and action plans for the Southern Region formulated by the Project are to be parts of the national economic and social development plan (NESDP) though the target period of the regional development strategies, plans and action plans is much longer than that of NESDPs. The following outline proposals are prepared for equitable and effective planning, implementation and monitoring/evaluation (M/E) of the regional development that contribute to equitable and effective national economic and social development.

Table 3.1-1 Issues and outline proposals on regional development administration

	Issue	Outline proposal
Planning regime		
Spatial divisions	<ul style="list-style-type: none"> - The following spatial divisions exist: 'Southern Region'; 'South-east Region'; 'South-west Region'; and 'governorates'. The former three are not official administrative unit. - Ministries and state agencies have offices only at governorate level except ODS of MDICI. - The governorate administration level is often called as 'regional' administration in Tunisia. - The government is now examining the establishment of a new administrative division of 'South-east/South-west Regions' or 'Southern Region' with the name of 'district'. 	<ul style="list-style-type: none"> * The 'Southern Region' would be suitable for regional planning; besides, development strategies and plans at governorate level are and will be formulated by respective governorates (Regional Councils) with technical supports of ODS and branch offices of other ministries. * Regional development plans whose target areas cover several governorates are quite important as economic and social regions generally extend to a few or several governorates and regional development plans can identify and suggest how the neighbouring governorates included in the region can develop as a unit through cooperation among the governorates. * Though the characteristics of the 'South-east Region' and 'South-west Region' are different, they can complement each other for achieving common development goal and vision.

	Issue	Outline proposal
		<ul style="list-style-type: none"> * Taskforces for elaboration of regional development plans have to be organised i) at governorate level for discussions with representatives of the public administration and ii) at the Southern Region level for planning for the region as a whole.
Role of economic and social development plans and master plans on territorial development	<ul style="list-style-type: none"> - National Economic and Social Development Plans (NESDPs) include the following sectors: <ul style="list-style-type: none"> i) productive sector, ii) infrastructure iii) environment (sustainable development), iv) human resource (education, science and technology), and v) social policy (health, culture, sports, women, youth, family, etc.). They are formulated through coordination by MDICI/ODS. - Ministry of Equipment, Housing and Spatial Planning (MEHAT) has formulated master plans on territorial development for the economic regions of the South-east and South-west according to the Code of Territorial and Urban Development Plan (Code de l'Aménagement du Territoire et de l'Urbanisme). 	<ul style="list-style-type: none"> * NESDPs are and will remain the most fundamental plans to be followed by all governmental ministries and agencies. * The annual budget of the government is and will be allocated according to the NESP after the approval of parliament.¹ * Coordination mechanism for formulation and implementation of NESDPs is essential for utmost use of limited resources (human and financial resources) for the national development. * Territorial development master plans formulated with geographic information and providing important information for economic and social development planning are and preferably will preferably be prepared in parallel with the NESDPs.
Planning period	<ul style="list-style-type: none"> - NESDPs have a 5-year target period, while the territorial development master plans have a 15-year target period. - At the time of preparation of the XIth NESDP, the government issued 'Note d'orientation du XI^{ème} Plan et de la décennie 2007-2016', which has a 10-year target period. 	<ul style="list-style-type: none"> * For adequate planning of NESDPs, medium-term plans and long-term strategies will have to be prepared. * With the medium- and long-term perspectives, NESDPs can be effectively prepared as short-term development plans. * Medium-term plans and long-term strategies will have to be reviewed once every five years before or during preparation of the next NESDP.
Relation between national and regional development plan	<ul style="list-style-type: none"> - Even before the Revolution, regional development plans (proposals) were prepared in the process of formulation of NESDPs in consultation with local people/authorities. - As conclusion of regional development plans, facility and infrastructure development projects are proposed. 	<ul style="list-style-type: none"> * Regional development plans to be prepared for formulation of NESDPs should have long-term strategies and medium-term plans for economic (productive sector) and social development of the region. * Proposals for infrastructure development should be formulated to support economic and social development.

¹ The XIth National Economic and Social Development Plan had not been approved by the parliament. According to MDICI; however, many programmes and projects listed in the plan were implemented as the plan was used in the annual budget allocation as a kind of master document.

	Issue	Outline proposal
Implementation, monitoring/evaluation		
Implementation of NESDP and regional development plans	<ul style="list-style-type: none"> - Respective ministries and state agencies implement programmes and projects as approved by the parliament. - Programmes and projects are implemented only after annual budget allocation. - Achievements of the previous NESDP are well described in NESDPs. Only positive (successful) descriptions are found in the plan documents. 	<ul style="list-style-type: none"> * It would be necessary to have coordination meetings for budget appropriation for the programmes/projects listed in the NESDP before respective ministries and state agencies start discussions on the next year's budget with the Ministry of Finance.
Coordination for attraction of investment/enterprises	<ul style="list-style-type: none"> - ODS has played an important role in providing one-stop service to prospective investors and enterprises who may invest in the Southern Region. 	<ul style="list-style-type: none"> * Investment in the Southern Region is essential and strategic attraction of investment/enterprises is very important for the development of the Southern Region. Therefore, coordination among various related organisations led by ODS is inevitable for effective attraction as well as for providing prompt and adequate services to prospective and existing investors/enterprises.
Monitoring and evaluation regime	<ul style="list-style-type: none"> - Generally, M/E are conducted by a ministry or state agency and no organisation is explicitly specialised in overall monitoring of regional development plans or NESDPs. - Recently, a specialised general directorate for M/E has been established. 	<ul style="list-style-type: none"> * Overall M/E for regional development plans should be conducted in coordination with ODS and the results should be public. * M/E can be conducted with the same organisation (taskforces) established for planning. * Overall monitoring meetings for regional development or national economic and social development should be regularly held, preferably twice a year.
Decentralisation/deconcentration and regional development		
Demarcation between the central government and local governments	<ul style="list-style-type: none"> - The new administration has a strong policy for decentralisation and deconcentration under the new constitution, which clearly defines concept of decentralisation. - Under the transition towards decentralisation, appropriate demarcation between the central and local government seems to be neither clearly discussed nor well concluded. 	<ul style="list-style-type: none"> * Planning, implementation, and M/E have to be done in a decentralised way. * Regional development plans at governorate level have to be formulated in parallel with the technical support of branch offices of the ministries and state agencies as mentioned above.

	Issue	Outline proposal
Public consultation (P/C)		
Objectives of P/C	<ul style="list-style-type: none"> - P/C meetings for the formulation of previous regional development plan were held just to collect comments and opinions of the participants. - P/C Participants have not been properly informed of why proposed programmes/projects are not included in NESDPs. 	<ul style="list-style-type: none"> * To make the P/C more equitable, effective and transparent, it is necessary to have P/C meetings to discuss whether drafts prepared by JET/ODS are acceptable or not, or what kind of modification or conditions are necessary to make them acceptable.
Separation of planning organisations and P/C organisation		<ul style="list-style-type: none"> * Public administration will have to participate in P/C not to make comments/opinions on the draft them but to prepare and explain the drafts with ODS. * It would be necessary to set up regional development taskforces whose members are responsible for preparing draft and explaining/discussing it in P/C meetings at governorate and at the Southern Region level. These members should be separate from those of P/C who will participate in discussion as representatives of the public.
Introduction of public comment	<ul style="list-style-type: none"> - Currently public consultation meetings are held just to collect comments/opinions of the public widely. 	<ul style="list-style-type: none"> * In the future, it would be better to make public consultation meetings places or opportunities for the representatives of the important stakeholder organisations to participate in in-depth discussions regarding proposals prepared by the public administration organisations. * A system should be introduced for collecting the public comments/opinions widely on the draft proposals for the development strategies and plans of the Southern Region.

Source: elaborated by JICA Expert Team (JET)

(2) Strategies and Plans

In line with the outline proposals, the strategies for regional development administration are proposed as shown in Table 3.1-2. A common objective of these strategies is to establish well-organised administration for the coordination among productive, social and physical infrastructure sectors as well as with the private sector to achieve the development vision, i.e., higher value-added, job creation and sustainability.

As strategies for regional development administration aim at well-coordinated planning, implementation and M/E, they will not bear any direct/indirect effect produced solely by implementing them. However, they will increase the positive effects of the other strategies proposed through enhancing inter-sectoral and inter-governorate cooperation/coordination/collaboration.

Table 3.1-2 Administration Strategies for development of the Southern Region

Code	Strategy	Effect (Direct/Indirect)			Indicator
		Value-added	Job-creation	Sustainability	
RP-1	Establishing coordination mechanism in planning, implementation and M/E of regional development	Through enhancing inter-sectoral (such as agriculture – food processing) and inter-governorate (such as governorate of primary products and that of final products) coordination, value-added as well as created jobs in the Southern Region will increase.		<ul style="list-style-type: none"> * Strengthened collaboration among enterprises will enable efficient pollution control. * Through enhanced inter-sectoral coordination, optimal groundwater allocation will be realised. 	<ul style="list-style-type: none"> - No. of created jobs - No. of illegal wastewater discharges - No. of groundwater over-exploitations - Amount of investment, etc., (Figures to be attained by implementation of only these strategies cannot be estimated or monitored)
RP-2	Strengthening collaboration for investment/ enterprise attraction	Through strengthened collaboration between public administration and public-private sectors, investment will be attracted more and that will subsequently increase value added and created jobs.		<ul style="list-style-type: none"> * By increasing investment through implementation of the strategy, enterprises will obtain financial resources for pollution control. 	
RP-3	Establishing public consultation system for regional development	With dialogues and trusts between public-private sectors encouraged through P/C, public-private partnership would be promoted and indirectly increase value-added and created jobs.		<ul style="list-style-type: none"> * Through strict monitoring by public consultation participants, enterprises will be encouraged to control the pollution. 	
RP-4	Establishing coordination mechanism for cluster development	Through enhanced coordination for cluster development, value-added as well as created jobs in the Southern Region will increase.		<ul style="list-style-type: none"> * Planned concentration of enterprises and the enhanced coordination among themselves will enable efficient pollution control. * Through enhanced coordination among farmers and enterprises, optimal groundwater allocation will be realised. 	

Source: elaborated by JET

Objectives, direct/indirect effect, indicators and development plans of each strategy are described below.

(a) RP-1: Establishing coordination mechanism in planning, implementation and monitoring/ evaluation of regional development

(i) Objective of the strategy

The objective of this strategy is to explicitly attain coordinated planning, implementation and monitoring/evaluation (M/E) of the regional development within public administration organisations, while public-private collaboration for reflecting public aspiration to regional development is planned to be promoted through implementation of Strategies RP-2 and RP-3. Through Strategy-1, coordination and adjustment mechanisms of planning and M/E in public administration for regional development is expected to be established as statutory procedure.

(ii) Direct/indirect effect

The implementation of this strategy, well-coordinated public administration of the planning, implementation and M/E of the regional development will enhance inter-sectoral and inter-governorate coordination and consequently contribute to higher value adding, job creation and sustainability.

(iii) Indicators

The indicators to measure the effects are i) number of created jobs, ii) number of illegal wastewater discharges, iii) number of groundwater over-exploitations, iv) amount of investment, etc., although it would be very difficult to quantitatively identify or measure the effect of this strategy.

(iv) Development plans

< RP-1-1: Defining a coordinated planning regime >

Short-term (2015–2020)²

At first, it is necessary to define well-organised institutional frame for regional development planning with the coverage of all necessary fields and with appropriate timeframe. Regional development planning should include the following fields: a) economic development (promotion of the productive sectors), b) social development (education, public health, culture, youth and sports, etc.) and c) public services and infrastructure development (transport, water supply, wastewater treatment, power supply, telecommunications, solid waste management, etc.).

Regional development plans also should consist of the following: i) long term development goal, vision and scenario for the region, ii) long term development strategies with a target period of 20 years, and iii) short- and medium-term development plans/action plans with a target period of 5–10 years.

Regional development plans in the NESDP are to be formulated once every five years with i) review of development goal, vision, scenario and strategies for the next 20 years, ii) review of medium-term plans/action plans as well as programme/project list, whose preparation is not included in the planning by the Project, for the next 10 years and iii) formulation of short-term plans/action plans as well as priority programme/project list for the next five years, which will provide basis for the regional development plan that compose the five-year NESDP.

As economic and social development requires involvement of various sectors, coordination among the public administration organisations (headquarters and regional offices), as listed below, is inevitable for effective and efficient planning, implementation of strategies, plans/action and plans as well as M/E of the implementation.

- 1) *Coordinating organisations:* Ministry of Development, Investment and International Cooperation (MDICI-Ministère du Développement de l'Investissement et de la Coopération International), South Development Office (ODS-Office de Développement du Sud)
- 2) *Productive sectors:* Ministry of Agriculture, Water Resources and Fisheries (MARHP-Ministère de l'Agriculture, des Ressources Hydrauliques et de la Pêche), Agency of Promotion

² Though the development plans are principally composed of 'institutional and human resources development plan', 'facility and infrastructure development plan' and 'financial and investment plan', types of the development plans are not described in the section of "Regional development administration" as all of the development plans of this section are institutional plans and budget allocation for the coordinating organization, namely ODS.

of Agricultural Investments (APIA-Agence de Promotion des Investissements Agricoles), Ministry of Industry, Energy and Mines (MIEM- Ministère de l'Industrie, de l'Energie et des Mines), Agency of Promotion of Industry and Innovation (APII-Agence de Promotion de l'Industrie et de l'Innovation), Ministry of Tourism and Handicraft (MTA- Ministère du Tourisme et de l'Artisanat), Tunisian National Office of the Tourism (ONTT-Office National Tunisien du Tourisme), Tunisian National Handicraft Office (ONAT-Office Office National de l'Artisanat Tunisien), Ministry of Trade (Ministre du Commerce), Ministry of Culture and Heritage Protection (MCSP-Ministère de la Culture et du Sauvegarde de la Patrimoine), Ministry of Employment and Vocational Training (MEFP-Ministère de l'Emploi et de la Formation Professionnelle), Ministry of Higher Education and Scientific Research (MESRS-Ministère de l'Enseignement Supérieur et de la Recherche Scientifique), Development and Investment Company of the South (SODIS-Société de Développement et d'Investissement du Sud), Investment Company in Risk Capital (SICAR-Société d'Investissement à Capital Risque), Bank for Financing of Small and Medium Enterprises (BFPME-Banque de Financement des Petites et Moyennes Entreprises), National Agricultural Bank (BNA-Banque Nationale Agricole), Tunisian Solidarity Bank (BTS-Banque Tunisienne de Solidarité), Tunisian Export Promotion Centre (CEPEX-Centre de Promotion des Exportations de la Tunisie), Foreign Investment Promotion Agency (FIPA-Agence de Promotion de l'Investissement Extérieur), research centres such as Arid Regions Institute (IRA-Institut des Regions Arides), Techno-poles/Cyber Parks/Parks of Economic Activities, national companies, such as Phosphate Company of Gafsa (CPG-Compagnie des Phosphates de Gafsa) and Tunisian Chemical Group (GCT-Groupe Chimique Tunisien), etc.

Social sectors: Ministry of Education (Ministère de l'Éducation), Ministry of Health (Ministère de la Santé), Ministry of Higher Education and Scientific Research (MESRS-Ministère de l'Enseignement Supérieur et de la Recherche Scientifique), Ministry of Social Affairs (MAF-Ministère des Affaires Sociales), Ministry of Woman and Family and Children (MJSFF-Ministère de la Femme, la Famille, et l'Enfance), Ministry of Youth and Sports (MJS- Ministère de la Jeunesse et du Sport), Ministry of Culture and Heritage Protection (MCSP-Ministère de la Culture et du Sauvegarde de la Patrimoine), etc.

Spatial planning and infrastructure and sustainability sector: Ministry of Equipment, Housing and Spatial Planning (MEATDD-Ministère de l'Équipement, de l'Aménagement du Territoire), Ministry of Transport (MTR-Ministère du transport), Ministry of Industry, Energy and Mines (MIEM-Ministère de l'Industrie, de l'Energie et des Mines), Ministry of Higher Education and Scientific Research (MESRS-Ministère de l'Enseignement Supérieur et de la Recherche Scientifique), National Water Distribution Utility (SONEDE-Societe Nationale d'Exploitation et de Distribution des Eaux), National Office of Drainage (ONAS-Office National de l'Assainissement), Tunisian Company of Electricity and Gas (STEG-Société Tunisienne de l'Electricité et du Gaz), Tunisia Telecom (TT-Tunisie Telecom) and other telecommunication companies (private), Minister of Environment and Sustainable Development (Ministre de l'Environnement et du Développement Durable), National Agency for Environmental Protection (ANPE-Agence Nationale de Protection de l'Environnement), National Agency of Waste Management (ANGED-Agence Nationale de Gestion des Déchets), etc.

Establishment of the official taskforces listed below is proposed. These taskforces are to be responsible for coordination of planning, implementation and M/E.

National committee for development of the Southern Region: This committee is to be composed of MDICI as coordinator, and ODS and relevant organisations from the headquarters of the above three sectors as members. Members of the national taskforce will be determined through consultation between MDICI and related ministries/agencies and will be approved by the Prime Minister. The national taskforce is to confirm the results of discussions of the regional taskforces on the development of the Southern Region. The national taskforce will also be able to instruct or recommend the regional taskforces to modify the draft they submit by the regional taskforce.

Regional taskforces for development of the Southern Region: A regional taskforce is to be organised for each of the six governorates and one for the Southern Region as a whole. The regional taskforces at the governorate level consist of representatives from ODS, namely, ODS regional directors, as coordinators, and representatives from relevant regional offices of the related organisations of the above three sectors. A maximum of 25 members of regional taskforces at governorate level will be selected from the members of the three regional sub-taskforces of the governorate by consensus of members at the first meeting of each regional sub-taskforce. Members of regional taskforces of the Southern Region will comprise ODS directors, as chief representatives from the respective regional taskforces at governorate level, and other two representatives who are selected by consensus among the members. Members of the regional taskforces are to participate in public consultation meetings not to give opinions and comments on the draft, but rather to explain the proposal to the participants of the public consultation meetings from the private sector or civil society organisations.

Results of discussions of the regional taskforces at the governorate level should be submitted to the regional taskforce of the Southern Region for discussion. Similarly, the Southern Region taskforces will submit their discussion results to the national taskforce for confirmation or modification.

Regional sub-taskforces for development of the Southern Region: Organizing three regional sub-taskforces are proposed for each of the six governorates. The three sub-taskforces are to be organised for the above-mentioned three sectors. Representatives of responsible public administration organisations of respective sector are to be nominated as members of the regional sub-taskforces by MDICI and ODS with a maximum number of 20. With agreements of headquarters and regional offices of the nominated organisations, the members are to be designated by the Secretary of Development and International Cooperation. ODS (the Regional Director of the governorate) is also to participate as a member. The coordinator is to be elected from among the members. Each sub-taskforce is to be responsible for the preparation of drafts to be submitted to the regional taskforce of the governorate.

The above regional taskforces and sub-taskforces for development of the Southern Region at governorate level should also assist the Regional Council to formulate regional development plans for respective governorates through conducting technical studies and preparing draft development plans to be submitted to and discussed by the Regional Councils.

Formulation of development plan for the Southern Region should have the following eight steps:

- Step 1: Determining contents of diagnostic studies [one month]
- Step 2: Conducting the diagnostic studies (by a consulting firm) [two months]
- Step 3: Examining results of the diagnostic studies [one month]
- Step 4: Reviewing the development goal, vision and scenario [one month]
- Step 5: Reviewing the development strategies [two months]
- Step 6: Reviewing the development plans and action plans [two months]
- Step 7: Formulating programme/project list and priority programme/project lists [two months]
- Step 8: Conducting an overall review and confirmation [one month]

In each step, the following process will be followed:

- 1) Preparation of draft by the regional sub-taskforces on development of the Southern Region
- 2) Discussion and review by the regional taskforces on development of the Southern Region (at the governorate level and the Southern Region level)
- 3) Review and confirmation by the national taskforce on development of the Southern Region

In parallel with discussions and reviews on development of the Southern Region, the regional taskforces at governorate level will have to prepare/review the development goal, vision, scenario, strategies, plans and action plans of the respective governorates.

Medium-term (2020–2025)

It would be necessary to revise continuously the planning regime according to the evolution of the economy and society of the Southern Region.

Short- and medium-term (2015–2025)

As regional development planning requires substantial volume of consulting services, ODS will have to obtain enough functional budget when the regional development is to be revised, once every five years.

< RP-1-2: Coordination for implementation and monitoring/evaluation >

Short- and medium-term (2015–2025)

As coordinated budget allocation is crucially important for proper implementation of the regional development plans, the MDICI/ODS have to immediately start discussions to determine budget allocation mechanism after the completion of the planning with relevant public administration organisations.

Same taskforces are proposed for conducting monitoring/evaluation (M/E). It is proposed to regularly (twice a year) hold joint M/E meetings on implementation of the national and regional development plans with participation of all major stakeholders. Reporting and discussion of M/E meetings are to proceed in the following way:

- * In each regional sub-taskforce meeting, monitoring reports that explain progress of the plans and action plans prepared by the organisations in charge of the plans and action plans are to be submitted, and required feedback actions, including those for other sectors, are to be discussed.

The results are to be forwarded to the regional taskforce at the governorate level, to the taskforce of the Southern Region, and finally to the national taskforce.

- * In the sub-taskforce meetings just before the start of annual budget preparation of the next year, budget proposal submitted to the Ministry of Economy and Finance (MEF-Ministère de l'Économie et des finances) from related organisations as well as the results of the monitoring are to be carefully discussed based on the budget allocation plans formulated at the time of planning. The results of the discussion are to be forwarded to the regional taskforces and then to the national taskforce where budget proposals from relevant sector organisations to MEF are to be finally coordinated.

Evaluation is proposed to start three and a half years after the commencement of the implementation of the plans/action plans that is formulated by the Project. The same organisations participated in the meetings for the planning and monitoring coordination are to participate in the evaluation meetings. Process of evaluation meetings will be as follows:

- * Each organisation in charge of respective plan/action plans will prepare draft evaluation report by compiling all monitoring reports by time with drafts on lessons learned for the review of the development vision/scenario, strategies, and plans/action plans.
- * The draft reports are to be discussed by the regional sub-taskforces, the regional taskforces at governorate level, the regional taskforce of the South, and the national taskforce.

< **RP-1-3: Capacity development for MDICI and ODS** >

Short- and medium-term (2015–2025)

As the roles and duties of MDICI and ODS will become more importance not only in coordinating i) the planning, implementation and monitoring/evaluation of the regional development but also in coordinating ii) the investment/enterprise attraction, and iii) implementing public consultation and public comment-. As for the introduction of overall M/E (RP-1-2), it would be better to request an international development partner to implement a technical cooperation project as the MDICI/ODS might have a little experience in conducting and coordinating overall M/E. As for the investment/enterprise attraction (RP-2), requesting another technical cooperation project is recommendable as investment/enterprise attraction is essential and substantial improvement is crucially required for the development of the Southern Region. Besides, as for the public consultation, MDICI/ODS can develop their capacity further through their own efforts as they have much experience in holding public consultation meetings with international development partners, and ODS has developed tangible capacity with the experiences. MDICI/ODS will be able to continue to develop their capacity by themselves.

(b) RP-2: Strengthening collaboration for investment/enterprise attraction

(i) Objective of the strategy

As attraction and invitation of investment and enterprises to the Southern Region are essential to achieve the development vision of higher value-adding productive sectors, more job creation and sustainable development, and as the investment/enterprises attraction involve various related organisations, the implementation of this strategy is very important for the regional development of the Southern Region.

To implement Strategy IME-1 and Plan IME-1-1–IME-1-3, public administration organisations and private economic organisations have to collaborate closely under the initiative of MDICI/ODS.

Concrete measures for attracting investment/enterprises are described in Section 3.4.3; the strategy for regional development administration focuses on how investment/enterprises attraction can be coordinated and collaborated for the better results.

(ii) Direct/indirect effect

Effective and efficient attraction of enterprises/investors (foreign and domestic) for higher value adding job creation and sustainability is expected through implementation of this strategy.

(iii) Indicators

The indicators of the effects of this strategy are i) number of created jobs, iv) amount of investment, etc., though it would be almost impossible to quantitatively measure or monitor the effect produced solely by this strategy.

(iv) Development plans

< RP-2-1: Enhancing a platform for investment attraction in the Southern Region >

Short- and medium-term (2015–2025)

Attraction and invitation of investors/enterprises can be attained only by winning the harsh international and domestic competition. To win the competition as well as to get utmost benefits of the attracted investment, the Southern Region requires definite strategies, utilising advantages specific to the Southern Region. For attraction and establishing good partnerships between the attracted investors/enterprises and the local companies, enhanced public-private partnership is highly required.

It would be better to establish and enhance a platform for investment/enterprise attraction composed of ODS, regional offices of APII, APIA and other related public entities, public and private financial institutions, private firms located in the Southern Region that are searching international or domestic partners, etc.

< RP-2-2 Enhancing connections with the central and foreign organisations >

Short- and medium-term (2015–2025)

ODS is an organisation specifically established for the Southern Region under MDICI and has a good position to promote investment to the South Region. It is able to use the channel through MDICI to related central organisations, such as Foreign Investment Promotion Agency (FIPA) and Ministry of Foreign Affairs, which has embassies in many countries of prospective investors, as well as representative offices of foreign business promotion agencies located in Tunis.

(c) RP-3: Establishing public consultation system for regional development

(i) Objective of the strategy

The objective of this strategy is to improve public consultation in the planning, implementation and M/E of the regional development. Under this strategy, establishing two types of public consultation mechanisms are proposed. The first one is to hold deliberative meetings regarding the draft documents

prepared by the public administration with the participation of economic organisations, civil societies, etc. The second one is a mechanism to incorporate public comments, in which the public can send their written comments on the draft regional development plan prepared by the public administration.

(ii) Direct/indirect effect

Effective and efficient incorporation of public aspiration into regional development will be realised by implementation of this strategy that will subsequently result in enhancing the trust between the public and private sectors, which then contribute to good coordination and to achieving the development vision. With participatory M/E, sustainable development will be encouraged.

(iii) Indicators

The indicators to measure the effects are i) number of created jobs, ii) number of illegal wastewater discharges, iii) number of groundwater over-exploitations, iv) amount of investment, etc., although it would be very difficult to measure the effect produced solely by this strategy.

(iv) Development Plans

< RP-3-1 Review of the regime of the public consultation >

Short-term (2015–2020)

Based on the results and experiences of the public consultation meetings held by the Project, the regime, such as member composition, meeting timing, observer participation, meeting validity, is to be revised, and these rules have to be written to make public consultation more formal, official and permanent. Designation of members of the public consultation meetings, invitation and participation as well as meeting formalities are to be reviewed, finalised and formalised, as proposed below. The largest difference between the regime followed in the Project and the one proposed as a plan is the way of participation of public administration organisations. In the public consultation meetings held in the Project, representatives from public administration organisations have participated as members and they have raised opinions/comments like any members of economic organisations or civil societies, while in the proposed public consultation meetings, they are in a position to prepare, propose drafts and explain them to the members.

Designation of members: Respective ODS Regional Directors are to work as coordinator/facilitator of public consultation at the governorate level (Sub-P/C). Representatives of the non-governmental business organisations such as Tunisian Union of Commerce, Industry and Handcraft Industry (UTICA–Union Tunisienne du Commerce, de l'Industrie et de l'Artisanat), Chamber of Commerce and Industry (Chambre de Commerce et d'Industrie), Regional Union of Agriculture and Fishery (URAP–Union Régional de l'Agriculture et de la Pêche), Tunisian General Work Union (UGTT–Union Générale Tunisienne du Travail), Confederation of Citizen Enterprises of Tunisia (CONNECT–Confédération des Entreprises Citoyennes de Tunisie), Tunisian Federation of Hotels (FTH– Fédération Tunisienne de l'Hôtellerie), Tunisian Federation of Travel Agencies (FTAV– Fédération Tunisienne des Agences de Voyages et de Tourism), etc., and civil organisations (NGOs) such as Junior Chambers (Jeunes Chambres), Development Associations (Associations de Developpement), Safeguard Association (Association Sauvegarde), Environmental NGOs, Women's Associations, etc., as well as representative members of Regional Council in each governorate will be nominated as members of Sub-P/C by

ODS in consultation with members of regional sub-taskforces and taskforces as well as the Governor. With agreement of the nominated organisations, each will be designated as the member by the Director General of the ODS. Three members of each Sub-P/C will be selected as members of public consultation of the Southern Region (the South P/C) by consensus of the members at the first meeting of each Sub-P/C. Director General of ODS will work as a coordinator/facilitator of P/C of the South.

Meetings of the public consultation: Meetings of Sub-P/Cs and South P/C for monitoring will be held twice a year after the monitoring meeting of the national taskforce. In case comments or opinions are raised against the results of the national taskforce meetings, the national taskforce will take them into account. The comments or opinions will be reflected in the feedback or budget allocations, or replied with the reason in case they are not reflected.

The meetings for planning will be held in Step 3–Step 8 before the national taskforce. Responses to the public comments, mentioned below, are discussed in Step 8.

Participation of observers: Observers are to be allowed to participate in the public consultation meetings. After public notice on date/time, venue, and agenda of the meeting is posted on the home pages of ODS website, legally registered organisations will be invited to apply for sending a representative to a Sub-P/C meeting. ODS could accept the participation of first ten applicants, for example, or examine appropriateness of application for participation by asking applicants to write the purpose of participation, opinions about existing strategies, plans or action plans in the application form, or apply both for selection of observers.

Observers will not be allowed to express their comments or opinions in principle. However, facilitators of the meeting, i.e., Regional Directors of ODS, might ask, listen or taken account of their comments/opinions according to the situation.

Validity of meetings and participation of representatives: Minimum number of participants, such as two third of the total number of the members, are to be defined to validate the meeting. Dispatching a deputy will be allowed when the representative cannot attend the meeting for unavoidable reason with prior notice to ODS in writing stating the name and post of the deputy in the organisation.

Meeting records: Major contents of discussions in Sub-P/C and South P/C meetings are to be recorded and distributed to all participants, including observers, within a certain time, such as within two weeks. Results of the discussion are to be published on the home pages of ODS.

Defining written rules: The above-mentioned and other rules are to be written and could be modified when the necessities arise.

Short-and medium-term (2015–2025)

ODS will have to obtain enough functional budget to manage public consultation meetings.

< RP-3-2 Introducing public comment >

Short-term (2015–2020)

Public consultation is a system for deliberate discussion where designated members are closely and carefully examine the drafts prepared by the public administration. It might be necessary to provide chances for ordinary citizens to give their comments and opinions, which are to be responded by the

public administration. When the comments or opinions are not reflected to the plans, the reasons why they are not reflected have to be explained.

- * After preparation of the draft development vision/scenario, strategies, plans and action plans, the drafts will be published on the home pages of the web sites of ODS and/or Regional Councils with clear the deadline for the public to submit their comments/opinions to ODS and/or Regional Councils, the deadline for ODS to reply to the comments/opinions in consultation with the regional taskforces. The period from the publishing to commenting could be one month and that for replies could also be a month.
- * The hard copies are also to be distributed in public places, such as offices of Regional Councils, Municipalities and/or Local Councils with clear notices of the deadline for the public to submit comments/opinions to ODS and/or Regional Councils in writing, and deadline for ODS to reply to the comments/opinions in consultation with the regional taskforces through distribution of the responses at the same places. The period between the distribution of the drafts and the submission of comments and that between the comment submission and distribution of responses could also be one month.
- * ODS in consultation with the regional taskforces is to prepare the replies that will explain how the comments/opinions will be reflected or why the comment/opinions is not reflected, and submit the draft replies to MDICI or the national taskforce for approval in a half month. MDICI or the national taskforce will be able to modify the replies and send back to ODS. The draft replies will be also discussed in the public consultation meetings. Afterwards, ODS will publish the replies on the home pages and advertise/ distribute at the same places of the draft distribution.

Medium-term (2020–2025)

Management of public comment system are to be continuously developed according to the results of the system and changes in the situation.

(d) RP-4: Establishing coordination mechanism for cluster development

(i) Objective of the strategy

Cluster development under public-private partnership has been selected as development scenario (Scenario 3). Although cluster will be developed mainly by the private sector as economic activities, this scenario emphasises the initiative of the public administration of planning, coordination and monitoring/evaluation for effective and efficient cluster development instead of spontaneous development by the private sector only.

(ii) Direct/indirect effect

Through enhanced coordination for cluster development, value-added as well as job creation in the Southern Region will increase. The planned concentration of enterprises and the enhanced coordination among themselves will enable efficient pollution control. Through enhanced coordination among farmers and enterprises, optimal groundwater allocation will be realised.

(iii) Indicators

The i) amount of investment, ii) number of created jobs, iii) number of illegal wastewater discharges, iv) number of groundwater over-exploitations, etc., would be used as indicators to measure the effects of the strategy implementation although it would be very difficult to measure the effect only by the implementation this strategy.

(iv) Development Plans

< RP-4-1 Formulation of a cluster development plan for the Southern Region >

Short-term (2015–2020)

As a less developed region, the development of the Southern Region will face various and serious difficulties. To utilise the potentials and to overcome constraints of the region, focus areas have to be identified for development of economic activities or promotion of the productive sector. In this regards, target (final) products of the cluster development have to be carefully examined and identified based on the proposals formulated by the Project for immediate promotion. Once the products for the promotion are identified, supporting actions, i.e., improvement of business environment and infrastructure development have to focus on and prioritise the promotion of the selected products for effective and efficient development of the productive sectors with limited financial and human resources.

< RP-4-2 Establishing cluster committees for respective identified products >

Short-term (2015–2020)

Cluster committees will have to be established for each selected product. The committee is to be composed of public and private organisations specialised in the product development and for the supporting actions as well as relevant civil organisations related to equitable and sustainable development. The committees will take not only deliberative functions but also operating functions for promoting collective activities to form, expand and upgrade clusters. The funds of the cluster committees are to consist of those coming from public budget and from contribution of the enterprises in the respective clusters. The public budget and the private contribution will be spent according to the nature of the operation by the committees.

< RP-4-3 Formulation of an implementation plan for each cluster development >

Short-term (2015–2020)

After establishment of the cluster committees, implementation plans will be formulated for respective cluster committees. The implementation plan can comprise middle-term (10-year) strategies and short-term (5-year) detailed action plans. The action plans have to be flexible to changes or fluctuation. Each implementation plan will contain i) product improvement plan (regarding productivity, quality, design, upgrading and cost reduction, etc.), ii) investment/enterprise attraction plans (regarding origin countries, actions to be taken for the attraction, etc.), iii) marketing/branding plan (regarding places of the markets, level of consumers, strategies for marketing/branding, actions to be taken for marketing/branding, etc.), and iv) infrastructure and facility plan (regarding type, scale, cost schedule, etc.).

< **RP-4-4 Coordination for implementation and M/E of cluster development** >

Short-term (2015–2020)

Coordination for implementation and M/E of cluster development has to be carried out in principle in the same ways as those for RP-1-2. Instead of regional development sub-taskforces, respective professional organisations specialised in the products will prepare monitoring and evaluation report prior to the committee meetings with public budget supports. Coordination for budget allocation will be done through the same mechanism of RP-1-2, and respective cluster committees will have to send respective recommendations for the budget allocation to the regional development taskforce at the South Region level. To cope with rapid changes in business circumstances, M/E would preferably have to be conducted more frequently than overall M/E.

(3) Plans and action plans

Plans and action plans are shown in Table 3.1-3 to Table 3.1-17.

Table 3.1-3 Plans for Strategy RP-1

Sector	Strategy	RP-1	Establishing coordination mechanism in planning, implementation and monitoring/evaluation of regional development		
	Plan		Actions	Term	Cost
Regional development administration	RP-1-1: Defining a coordinated planning regime		<ul style="list-style-type: none"> – Defining coverage/contents of regional development plans – Defining coordination mechanism among sectors and among national/regional/governorate levels for planning – Organising planning taskforces meetings – Review of development strategies, plans and action plans for the Southern Region 	Short–Medium	DT. 315 thousand (DT. 105 thousand for meetings and DT. 210 thousand for diagnostic study)
	RP-1-2: Coordination for implementation and M/E		<ul style="list-style-type: none"> – Defining budget allocation adjustment mechanism – Defining coordination mechanism for monitoring – Defining coordination mechanism for evaluation – Conducting M/E regularly 	Short–Medium	DT. 21 thousand/year for meetings
Regional development administration	RP-1-3: Capacity development for MDICI and ODS		<ul style="list-style-type: none"> – Capacity development for facilitating overall joint M/E of the national and regional development plans – Capacity development for facilitating the comprehensive improvement of attraction of investors and enterprises – Capacity development for public consultation and public comment 	Short–Medium	DT. 3,400 thousand*

Note: * Technical Assistance for M/E: DT. 1,250 thousand (Consultant fee: DT. 700 thousand, Travel cost: DT. 400 thousand, Operating cost: DT. 150 thousand); and Technical Assistance for attraction of investors/enterprises: DT. 2,150 (Consultant fee: DT. 1,050 thousand, Travel cost: DT. 600 thousand, Operating cost: DT. 500 thousand)

Source: JET

Table 3.1-4 Action Plans for Plan RP-1-1

Strategy	RP-1	Establishing coordination mechanism in planning, implementation and monitoring/evaluation of regional development		
Plan	RP-1-1	Defining a coordinated planning frame		
Intervention Area	All over the Southern Region	Implementing agency	MIDCI, ODS	
Description				
Defining the planning regime of regional development includes defining contents/coverage, target period of the regional development plans that comprise parts of the five-year national economic and social development plan. The definition also includes membership and functions of the regional sub-taskforces, regional taskforces, and national taskforce(s) for regional development planning as well as relations among them. The definition will have to be documented as regulations/guidelines/agreements/memorandum.				
Action Plan				
Actions		Relevant organizations		Role
- Defining coverage/ contents of regional development plans		- MDICI - ODS - MEHAT*		- Defining the relation between regional and national economic and social development plans - Defining coverage/contents/target period of regional master plans on territorial development - Defining planning frame of the regional development plan
- Defining coordination mechanism for planning among sectors and between national and regional level taskforces		- MDICI, ODS - MOI** - MF*** - Regional and Local Councils		- Defining membership, functions and relations of regional sub-taskforces and taskforces, and national taskforces for regional development - Discussions and agreement on organising the regional sub-taskforces and taskforces, and national taskforces with relevant organisations
- Establishing planning organisations		- MDICI, ODS - Related sector ministries and agencies		- Designation of the members - Preparation of the meeting rules - Approval of meeting rules by members
- Review of development strategies, plans and action plans of the Southern Region		- ODS/MDICI		- Holding meetings of the regional sub-taskforces and taskforces, and national taskforces - Preparation of minutes of discussion and confirmation with participants - Reflecting the results of discussion in the drafts
Indicator			Risk	
- Rate of participation of members or their designated deputies in the sub-taskforce and taskforce meetings			- A consensus may not be reached on an important agenda, budget allocation for example, because of conflicts of interests of related public administration organisation	

Note: * MEHAT: Ministry of Equipment, Housing and Spatial Planning, ** MOI: Ministry of Home Affairs, *** MF: Ministry of Finance

Source: JET

Table 3.1-5 Action Plans for Plan RP-1-2

Strategy	RP-1	Establishing coordination mechanism in planning, implementation and monitoring/evaluation		
Plan	RP-1-2	Coordination for implementation and monitoring/evaluation		
Intervention Area	All over the Southern Region	Implementing agency	ODS	
Description				
Discussion for defining budget allocation mechanism has to start immediately after the planning completion. Monitoring and evaluation are very important for proper implementation of the regional development plan and for the next planning. Definition the monitoring/evaluation mechanisms also has to be commenced soon.				
Action Plan				
Actions		Relevant organizations	Role	
– Defining budget allocation adjustment mechanism		– MF* – MDICI, ODS – MOI**, Regional and Local Councils	– Defining process and timing of budget allocation coordination – Defining rules of budget allocation coordination	
– Defining coordination mechanism for monitoring		– MDICI, ODS – MOI**, Regional and Local Councils	– Defining process of overall monitoring – Holding overall monitoring meetings – Feeding-back monitoring results to implementation	
– Defining coordination mechanism for evaluation		– MDICI, ODS	– Defining the process of overall for evaluation – Holding overall meeting and drawing lessons learned – Reflecting lessons learned in the next planning	
Indicator			Risk	
– Rate of participation of members or their designated deputies in the sub-taskforce and taskforce meetings			– Public administration organisations generally do not want to disclose the facts of failures.	

Note: * MF: Ministry of Finance, ** MOI: Ministry of Home Affair

Source: JET

Table 3.1-6 Action Plans for Plan RP-1-3

Strategy	RP-1	Establishing coordination mechanism in planning, implementation and monitoring/evaluation		
Plan	RP-1-3	Capacity development for MDICI and ODS		
Intervention Area	All over the Southern Region	Implementing agency	ODS	
Description				
Capacity development of MDICI and ODS for coordination of i) planning, implementation and M/E of development of the Southern Region, ii) attraction of investors and enterprises to the Southern Region, and iii) public consultation/public comment. For i), newly appointed staff of General Directorate of Monitoring and staff of ODS headquarters specialised in M/E have to be trained systematically, preferably with technical assistance of international development partners. As for ii), ODS and MDICI staff members should have opportunities of technical assistance for comprehensive improvement of the attraction of domestic and foreign investors and enterprises. Regarding iii), ODS and MDICI can develop their capacity continuously and sustainably by themselves.				
Action Plan				
Actions	Relevant organizations		Role	
- Capacity development for facilitating overall joint M/E of the national and regional development plans	- MDICI, ODS		<ul style="list-style-type: none"> - Applying technical assistance on M/E for national and regional development plans - Acquiring knowledge and skills for coordination of overall joint M/E of the national and regional development plans through implementation of the technical assistance project - Further developing the capacity for coordination of overall M/E with self-supporting efforts 	
- Capacity development for facilitating comprehensive improvement of attraction of investors and enterprises	<ul style="list-style-type: none"> - MDICI, ODS - FIPA - APII, APIA 		<ul style="list-style-type: none"> - Applying technical assistance on attraction of investment/enterprises - Acquiring knowledge and skills for managing the platform and developing channels for investment/enterprises attraction through implementation of the technical assistance project - Further developing the capacity for investment/enterprises attraction by their own efforts 	
- Capacity development for public consultation and public comment	<ul style="list-style-type: none"> - MDICI, ODS - Related public administration organisations 		<ul style="list-style-type: none"> - Continuing the capacity development by self-sustaining efforts with the experiences obtained through collaboration with international development partners 	
Indicator			Risk	
- Number of facilitators who has sufficient knowledge and skills on facilitation as well as i) M/E, ii) attraction of investors/enterprises and iii) public consultation and public comment in MDICI and ODS			- Skilled staff may leave MDICI or ODS	

Source: JET

Table 3.1-7 Plans for Plan RP-2

Sector	Strategy	RP-2	Strengthening collaboration for investment/enterprise attraction		
	Plan		Actions	Term	Cost
Regional development administration	RP-2-1: Enhancing the platform for investment attraction to the Southern Region		<ul style="list-style-type: none"> - Examining membership, activities and so on of the platform - Organising the platform 	Short–Medium	---
	RP-2-2 Enhancing the connection with the central and foreign organisations		<ul style="list-style-type: none"> - Identifying necessary and possible channels for investment/enterprise attraction - Developing channels with central and foreign organisations 	Short–Medium	---

Source: JET

Table 3.1-8 Action Plans for Plan RP-2-1

Strategy	RP-2	Strengthening collaboration for investment/enterprise attraction		
Plan	RP-2-1	Enhancing a platform for investment attraction to the Southern Region		
Intervention Area	All over the Southern Region	Implementing agency	ODS	
Description				
For attraction and establishment of good partnerships between attracted investors/enterprises and the local companies, enhanced public–private partnership (among Tunisian organisations) is highly required. A platform should be established for investment/enterprise attraction composed of ODS, regional offices of APII, APIA, Techno-poles, etc. Activities and actions as shown below have to be substantially enhanced.				
Action Plan				
Actions	Relevant organizations	Role		
<ul style="list-style-type: none"> - Examining membership, activities and so on of the platform 	<ul style="list-style-type: none"> - ODS - APII, APIA - MDICI 	<ul style="list-style-type: none"> - Examining membership, activities, rules, etc., of the platform - Preparing rules of the platform 		
<ul style="list-style-type: none"> - Organising the platform 	<ul style="list-style-type: none"> - ODS - Other key members 	<ul style="list-style-type: none"> - Organising the platform - Preparation of activity plan of the platform 		
Indicator		Risk		
<ul style="list-style-type: none"> - Number of private-sector participants in the to the platform 		<ul style="list-style-type: none"> - Conflicts could arise among members due to their different interests. 		

Source: JET

Table 3.1-9 Action Plans for Plan RP-2-2

Strategy	RP-2	Strengthening collaboration for investment/enterprise attraction		
Plan	RP-2-2	Enhancing connections with the central and foreign organisations		
Intervention Area	All over the Southern Region	Implementing agency	ODS	
Description				
Channels connecting the local platform with the central government and foreign organisations have to be developed by MDICI and ODS. Through the channels, activities to attract investment/enterprises can be promoted.				
Action Plan				
Actions	Relevant organizations		Role	
<ul style="list-style-type: none"> - Identifying necessary and possible channels for investment/enterprise attraction 	<ul style="list-style-type: none"> - MDICI/ODS - FIPA and other agencies and ministries - Foreign delegations in Tunisia - Economic organisations (UTICA, Chamber of Commerce and Industry, etc.) in other regions 		<ul style="list-style-type: none"> - Identifying productive sectors that require and may attract investment in the Southern Region - Identifying possible contacts for channel development 	
<ul style="list-style-type: none"> - Developing channels with central and foreign organisations 	<ul style="list-style-type: none"> - MDICI/ODS - FIPA and other agencies and ministries - Foreign delegations in Tunisia - Economic organisations (UTICA, Chamber of Commerce and Industry, etc.) in other regions 		<ul style="list-style-type: none"> - Contacting identified institutions/organizations - Setting-up regular and occasional meetings with foreign delegations and economic organisations - Establishing referral system with foreign 	
Indicator			Risk	
<ul style="list-style-type: none"> - Number of channels developed for investment/enterprise attraction 			<ul style="list-style-type: none"> - Conflicts could arise among members due to their different interests. 	

Source: JET

Table 3.1-10 Plans for Plan RP-3

Sector	Strategy	RP-3	Establishing public consultation system for regional development		
	Plan		Actions	Term	Cost
Regional development administration	RP-3-1: Review of the regime of the public consultation		<ul style="list-style-type: none"> - Review of the regime of public consultation in the Project - Re-defining the public consultation regime - Organising public consultation organisation of the six governorates and the Southern Region - Prepare manual for management of public consultation meetings - Continuation of public consultation meetings 	Short-Medium	For M/E DT. 10.5 thousand /year (meetings) For planning DT. 52.5 thousand/
	RP-3-2: Introducing public comment		<ul style="list-style-type: none"> - Defining the public comment regime - Implementation of public comment 	Short-Medium	---

Source: JET

Table 3.1-11 Action Plans for Plan RP-3-1

Strategy	RP-3	Establishing public consultation system for regional development		
Plan	RP-3-1	Review of the regime of the public consultation		
Intervention Area	All over the Southern Region	Implementing agency	ODS	
Description				
Based on the results and experience of the public consultation meetings held in the Project, the regime of the public consultation is to be reviewed. Public consultation regime is to be redefined in consultation with participants of the public consultation meetings held during the Project.				
Action Plan				
Actions	Relevant organizations		Role	
<ul style="list-style-type: none"> - Review of the regime of public consultation in the Project 	<ul style="list-style-type: none"> - ODS - Members of the existing public consultation 		<ul style="list-style-type: none"> - Preparing draft review report - Discussion with related ministries/agencies - Discussion with Governors/Mayors, 	
<ul style="list-style-type: none"> - Re-defining public consultation regime 	<ul style="list-style-type: none"> - MDICI /ODS - Members of the regional sub-taskforces, taskforces and the national taskforce - Organisations of candidate/nominated members of the public consultation 		<ul style="list-style-type: none"> - Preparing draft definitions - Discussion in the meetings of the regional sub-taskforces, taskforces and the national taskforce for regional development - Discussion in public consultation meetings at governorate level and of the Southern Region 	
<ul style="list-style-type: none"> - Organising public consultation meetings 	<ul style="list-style-type: none"> - MDICI/ODS - Members of the public consultation - Members of the regional sub-taskforces, taskforces and the national taskforce 		<ul style="list-style-type: none"> - Implementing public consultation meetings - Reviewing the results and feeding back to the next public consultation meetings. 	
Indicator			Risk	
<ul style="list-style-type: none"> - Rate of participation of members or their designated deputies in the public consultation meetings 			<ul style="list-style-type: none"> - It could be sometime difficult or impossible to reach consensus, and that may cause conflicts among participating organisations, 	

Source: JET

Table 3.1-12 Action Plans for Plan RP-3-2

Strategy	RP-3	Establishing public consultation system for regional development	
Plan	RP-3-2	Introducing public comment	
Intervention Area	All over the Southern Region	Implementing agency	ODS
Description			
To complement deficits of public consultation introduced by the Project, and to fully incorporate aspiration of the public, a type of public comment has to be introduced, in which the public can write and send comments/opinions to the draft regional development plans sited in the web site or distributed in public places.			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Defining the regime of public comments 	<ul style="list-style-type: none"> - ODS, with the assistance of Municipal and Regional Councils - The regional sub-taskforces, taskforces and the national taskforce - 	<ul style="list-style-type: none"> - Preparing draft definitions - Discussion in the meetings of the regional sub-taskforces, taskforces and the national taskforce for regional development - Discussion in public consultation meetings at governorate level and of the Southern Region 	
<ul style="list-style-type: none"> - Organising public comment 	<ul style="list-style-type: none"> - ODS, with the assistance of Municipal and Regional Councils - The regional sub-taskforces, taskforces and the national taskforce - Members of the public consultation - 	<ul style="list-style-type: none"> - Implementing public comment - Reviewing the results and feeding back to the next public comment 	
Indicator		Risk	
<ul style="list-style-type: none"> - Number of meaningful comments discussed in the public consultation meetings - Number of comments responded publicly 		<ul style="list-style-type: none"> - There might be few comments. - There might be many rude or irrelevant comments which ODS will have to carefully deal with. 	

Source: JET

Table 3.1-13 Plans for Strategy RP-4

Sector	Strategy	RP-4	Establishing coordination mechanism for cluster development		
	Plan		Actions	Term	Cost
Regional development administration	RP-4-1: Formulation of a cluster development plan for the Southern Region		<ul style="list-style-type: none"> - Conducting researches on cluster development - Identifying products for cluster formation - Identifying locations of clusters - Planning for business environment improvement - Planning for infrastructure development projects 	Short	
	RP-4-2: Establishing cluster committees for respective identified products		<ul style="list-style-type: none"> - Defining membership (economic organisations, public administration, academic entities, civil society, etc.) and functions of the committee - Defining rules of the committee - Organising the committee - Formulation of annual operation plan of the committee 	Short	
	RP-4-3: Formulation of an implementation plan for each cluster development		<ul style="list-style-type: none"> - Conducting researches on each cluster development - Product improvement plan - Investment/enterprise attraction plan - Marketing/branding plan - Infrastructure and facility plan 	Short	
	RP-4-4: Coordination for implementation and M/E		<ul style="list-style-type: none"> - Requesting budget allocation for cluster development as well as for operation of the committee through regional development taskforce - Implementation of the operation plan - Conducting M/E regularly - Feed-back of M/E result to subsequent operation and the next operation plan 	Short-Medium	

Source: JET

Table 3.1-14 Action Plans for Plan RP-4-1

Strategy	RP-4	Establishing coordination mechanism for cluster development		
Plan	RP-4-1	Formulation of a cluster development plan for the Southern Region		
Intervention Area	All over the Southern Region	Implementing agency	MDICI, ODS, Regional Development Taskforce of the Southern Region	
Description				
For cluster development in the Southern Region, the first thing to do is to identify (final) products based on the proposals formulated in the Project. Then, supporting actions for business environment improvement and infrastructure development should be effectively and efficiently focussed according to the cluster development plans. Gradual cluster development should be planned according the potential of the cluster development.				
Action Plan				
Actions		Relevant organizations		Role
- Conducting researches on cluster development		- MDICI - ODS		- MDICI/ODS: Preparation of terms of reference (TOR) for researches to identify products in consultation with stakeholders, and conducting the research using consulting companies.
- Identifying products for cluster formation		- MDICI, ODS - Regional and national taskforce for the Southern Region Development - Members of Public Consultation - Regional and Local Councils		- MDICI/ODS: Organising and coordinating preparation of drafts with the support of members of national and regional taskforce for the Southern Region Development - MDICI/ODS: Holding P/C meetings to discuss about the drafts. - MDICI/ODS: Consulting with regional and local authorities.
- Identifying locations of clusters				
- Planning for business environment improvement		- MDICI, ODS - Related sector ministries and agencies		
- Planning for infrastructure development projects		- ODS/MDICI		
Indicator			Risk	
- Enough information and data are collected on time for identification of products for cluster development in the Southern Region.			- MDICI/ODS does not have enough human and financial resources to conduct or manage the researches. - Other ministries may oppose the researches by MDICI/ODS.	

Source: JET

Table 3.1-15 Action Plans for Plan RP-4-2

Strategy	RP-4	Establishing coordination mechanism for cluster development		
Plan	RP-4-2	Establishing cluster committees for respective identified products		
Intervention Area	All over the Southern Region	Implementing agency	MDICI, ODS, Regional Development Taskforce of the Southern Region, P/C members	
Description				
<p>Cluster committees are the core organisations for the development of respective clusters. With concepts of public-private partnership (PPP), the committees' members are composed of representatives of professional organisations specialised in the respective products, either public or private, including research and development (R&D) and academic institutes with civil organisations to check social equitableness and environmental sustainability. The cluster committees can have deliberative functions as well as operational functions, such as marketing researches, or promotional and branding activities with budget supports and contributions from private companies. The chairperson has to be a representative of the public entity in charge of the productive sector so that a specific company may not get more benefits from the committee activities.</p>				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Defining membership (economic organisations, public administration, academic entities, civil society, etc.) and functions of the committee 		<ul style="list-style-type: none"> - MDICI, ODS - National and regional development taskforce for the Southern Region - Members of P/C - Regional and Local Councils 		<ul style="list-style-type: none"> - MDICI/ODS: Preparation of membership drafts, functions and rules, of the committees with the support of members of regional development taskforce for the Southern Region - MDICI/ODS: Holding P/C meetings to discuss about the drafts. - MDICI/ODS: Consulting with regional and local authorities.
<ul style="list-style-type: none"> - Defining rules of the committee 				
<ul style="list-style-type: none"> - Organising the committee 		<ul style="list-style-type: none"> - Public entity in charge of the productive sector - MDICI/ODS 		<ul style="list-style-type: none"> - Public entity in charge of the productive sector: Organising the committees according to the above-mentioned definitions in consultation with MDICI/ODS
<ul style="list-style-type: none"> - Formulation of annual operation plan of the committee 		<ul style="list-style-type: none"> - Public entity in charge of the productive sector - Members of the cluster committee 		<ul style="list-style-type: none"> - Public entity in charge of the productive sector: Preparation of draft annual operation plan and discussing it in the committee meetings.
Indicator			Risk	
<ul style="list-style-type: none"> - Ratio of numbers of organisations willing to participate to the total number of related (or invited) organisations 			<ul style="list-style-type: none"> - Some leading companies may not agree to join the committee. - Conflicts may arise among the public entities due to their different interests. 	

Source: JET

Table 3.1-16 Action Plans for Plan RP-4-3

Strategy	RP-4	Establishing coordination mechanism for cluster development		
Plan	RP-4-3	Formulation of an implementation plan for each cluster development		
Intervention Area	All over the Southern Region	Implementing agency	Members of the cluster committee(s)	
Description				
Detailed implementation plans for respective clusters have to be formulated with participation of all stakeholders. The implementation plan will comprise middle-term (10-year) strategies and short-term (5-year) detailed action plans, and the latter should correspond to the 5-year NESDPs. Implementation plans will have i) product improvement plan, ii) investment/enterprise attraction plans, iii) marketing/branding plan, and iv) infrastructure and facility plan. The implementation plans have to be revised once every five years in principle. However, it should occasionally be revised corresponding to the changes in the circumstances.				
Action Plan				
Actions		Relevant organizations	Role	
- Conducting researches on each cluster development		- Public entity in charge of the productive sector	- Public entity in charge of the productive sector: Preparation of terms of reference (TOR) for researches to identify products in consultation with members of cluster committee.	
- Product improvement plan		- Public entity in charge of the productive sector - Members of the cluster committee	- Public entity in charge of the productive sector: Preparation of draft annual operation plan and discussing it in the committee meetings.	
- Investment/enterprise attraction plan				
- Marketing/branding plan				
Indicator		Risk		
- Effective plans are formulated.		- Consensuses may not be reached among the private sector organisations or between companies and civil organisations. - Conflicts may arise among the public entities due to their different interests.		

Source: JET

Table 3.1-17 Action Plans for Plan RP-4-4

Strategy	RP-4	Establishing coordination mechanism for cluster development	
Plan	RP-4-4	Coordination for implementation and M/E	
Intervention Area	All over the Southern Region	Implementing agency	Members of the cluster committee(s)
Description			
<p>As cluster development involves multiple sector organisations, coordination for budget allocation is critically important for proper and synchronised implementation of related actions. As preparation of monitoring and evaluation (M/E) report determines quality of M/E and effectiveness and efficiency of subsequent actions as well as appropriateness of the revision of the plans, professional entities in charge of preparation of M/E reports will have to be well supported by providing necessary resources. M/E are to be conducted more frequently than overall M/E mentioned in RP-1-2. Monitoring should cover not only performances of actions by related organisations and enterprises but also circumstances, such as foreign exchange rates, economic conditions of market counties, performances of the competitors, etc.</p>			
Action Plan			
Actions	Relevant organizations		Role
<ul style="list-style-type: none"> - Requesting budget allocation for cluster development as well as for operation of the committee through regional development taskforce 	<ul style="list-style-type: none"> - Public entity in charge of the productive sector - Members of the cluster committee - Regional development taskforce of the Southern Region 		<ul style="list-style-type: none"> - Public entity in charge of the productive sector: Forwarding discussion results to the regional development taskforce of the South
<ul style="list-style-type: none"> - Implementation of the operation plans 	<ul style="list-style-type: none"> - Public entity in charge of the productive sector - Members of the cluster committee 		<ul style="list-style-type: none"> - Public entity in charge of the productive sector: Coordinating the implementation of operation plans of the cluster committee - Member of the cluster committee: implementing and cooperating for implementation of operation plans
<ul style="list-style-type: none"> - Conducting M/E regularly 			<ul style="list-style-type: none"> - Public entity in charge of the productive sector: Preparation of draft M/R reports - Member of the cluster committee: discussion and approval/modification of the M/E report - Public entity in charge of the productive sector: Forwarding M/E reports to the regional development taskforce of the South
<ul style="list-style-type: none"> - Feed-back of M/E result to subsequent operation and the next operation plan 			<ul style="list-style-type: none"> - Public entity in charge of the productive sector: Coordinating the implementation of necessary actions - Member of the cluster committee: implementing and cooperating for implementation of necessary actions
Indicator			Risk
<ul style="list-style-type: none"> - Amount of investment - Number of created jobs - Balanced job creation - Reduced pollution - No. of illegal wastewater discharges - No. of groundwater over- exploitations 			<ul style="list-style-type: none"> - Consensuses are not reached among the private sector organisations or between companies and civil organisations. - Conflicts arise among the public entities due to their different interests.

Source: JET

3.2 Development strategies and plans in productive sectors

3.2.1 Agriculture, fishery, livestock breeding and food processing

(1) Summary of current condition analysis and major development issues

(a) Summary of current condition analysis

The results of the diamond analysis, detailed in Chapter 5.1 of Part I, are summarized in Table 3.2-1. The diamond analysis was conducted on products such as dates, olive and olive oil, arboriculture (other than olive and dates), vegetables, livestock breeding, fishery, aquaculture, and fish processing products which have certain production volume at present and are expected to have 3M (marketability, manufacturability, and margin) in the Southern Region.

Dates is characterized by its rich resource condition and competitiveness in international market. The quality of olive oil is very high, but the lack of value added bulk product is a critical issue. Some arboriculture products have gained excellent reputations in domestic and international markets, but the production volume and collective activity of farmers are limited. The production volume of vegetable is not so large, but there is much room for the promotion of off-season vegetable production taking advantage of geothermal greenhouse. Livestock products such as broiler, milk and dairy products have large demand in domestic market, but the cost, especially that of feed, should be reduced for the promotion. Due to the limitation of aquatic resources, aquaculture and processed fish product potential seem limited the coastal area, but again the cost of feed and energy must be reduced for further promotion. As a result, products such as dates, olive oil, broiler, milk and dairy products, and aquaculture and fish processing products are considered to be high potential products in the Southern Region, followed by arboriculture other than dates, and off-season vegetables.

Table 3.2-1 Diamond analysis on agriculture, fishery, livestock breeding and food processing in the Southern Region

Products	Factor conditions	Demand conditions	Related and supporting industries	Firm strategy, structure, and rivalry	Markets and competition
Dates	<ul style="list-style-type: none"> Dates are major products represented by Deglet Nour Productivity is lower than other countries Water consumption needs to be economized 	<ul style="list-style-type: none"> There are many varieties corresponding to market demand Almost all of dates exported by Tunisia are from the South 	<ul style="list-style-type: none"> There are many collecting units and conditioning factories Other supporting industries are not located in the South 	<ul style="list-style-type: none"> Typical sales strategy is selling large amount of products in Ramadan season Some point out the necessity of national office specialized in dates 	<ul style="list-style-type: none"> It is world's largest exporter of dates in value terms It is highly competitive in the international market
Olive and olive oil	<ul style="list-style-type: none"> They are major products along with dates There is sufficient capacity of oil mills Production volume is fluctuating due to rainfall condition Sub-products are used as fuel and animal feed 	<ul style="list-style-type: none"> Local and international markets closely monitor the quality of olive oil Olive oil quality meets the international criteria 	<ul style="list-style-type: none"> Few bottling companies exist in the South Supporting industries need to be developed to reinforce value chain 	<ul style="list-style-type: none"> Export strategy is elaborated by exporters with National Oil Office and Promotion Program for Olive Oil, etc. There is discontinuity between production and bottling/export 	<ul style="list-style-type: none"> It is the fourth largest exporter of virgin olive oil in international market Losing much value added due to the export of bulk product to Italy and Spain
Arboriculture (other than olive and dates)	<ul style="list-style-type: none"> Typical products vary by governorate (fig in Médenine and Gabès, almond in Gafsa, etc.) Some are produced by triple-layered oasis 	<ul style="list-style-type: none"> Some have got an excellent reputation (e.g., pomegranate of Gabès) Others are for 	<ul style="list-style-type: none"> There are very few and scattered food processing units in the South Supporting industries need to 	<ul style="list-style-type: none"> Excluding some products which have had certain production volume and reputation, collective activity of 	<ul style="list-style-type: none"> Production volume is lower than that of major exporters It is better to focus on domestic market to increase production

Products	Factor conditions	Demand conditions	Related and supporting industries	Firm strategy, structure, and rivalry	Markets and competition
	<ul style="list-style-type: none"> agriculture The volume is insufficient 	<ul style="list-style-type: none"> home consumption and/or local market 	<ul style="list-style-type: none"> be developed 	<ul style="list-style-type: none"> farmers needs to be promoted for commercialization 	<ul style="list-style-type: none"> volume and to improve quality and productivity
Vegetables	<ul style="list-style-type: none"> Production volume is not enough to satisfy local demand Some produce vegetables of high value (e.g., tomato in Gabes, winter vegetables in Gafsa) for national market and export 	<ul style="list-style-type: none"> The volume is insufficient for local demand in the South 	<ul style="list-style-type: none"> Agricultural cooperatives who can supply materials are gradually increasing 	<ul style="list-style-type: none"> It is relatively easy to produce various vegetables according to price variation and opportunity in the market 	<ul style="list-style-type: none"> Producers of off-season vegetables are targeting niche market of other regions/countries
Livestock Breeding	<ul style="list-style-type: none"> Meat, egg, milk, and raw materials for handicraft (wool and leather) are produced Number of sheep, goat, and cattle has decreased in the South due to high price of feed Number of hen and cow are stable or increasing because of feed efficiency and selling price 	<ul style="list-style-type: none"> There is high demand of red meat, poultry meat, egg, milk, and dairy products 	<ul style="list-style-type: none"> Some agricultural cooperatives provide animal feed at reasonable price Collected milk is supplied to the other regions There is only one dairy product factory in Médenine There is no slaughterhouse 	<ul style="list-style-type: none"> Sheep and goat breeding is combined with olive and dates farming for organic agriculture Some company have a marketing strategy to neighbouring countries 	<ul style="list-style-type: none"> Local market and international market of neighbouring countries seem to be promising
Fishery, aquaculture, and fish processed product	<ul style="list-style-type: none"> Aquaculture and lagoon fishing are increasing Number of fishermen and fishery infrastructure and the volume of aquatic resource are not necessarily balanced 	<ul style="list-style-type: none"> There is high demand especially in coastal area of Tunisia Fish processing products are promising in domestic and international markets 	<ul style="list-style-type: none"> Equipment and infrastructure of fishery need to be renewed There is no supplier of fish feed and medicine Organic waste treatment facilities are needed 	<ul style="list-style-type: none"> It is difficult for fishermen to collectively engage in fishery promotion due to the lack of cooperatives Some tuna can producers have robust sales strategy 	<ul style="list-style-type: none"> Both domestic and international markets seem to be promising Some tuna can producers have met the international standard to export to the US, EU, and Gulf countries.

Source: JET

(b) Constraints

Based on the result of the diamond analysis and field survey conducted by JET, major constraints on the promotion of agricultural development in the South are summarized in Table 3.2-2.

Table 3.2-2 Major constraints on the promotion of agricultural development in the South

Categories	Constraints	Extent
Resources	1) Limitation of water resource	Very severe
	2) Limitation of farmland	Severe
	3) Limitation of aquatic resources	Severe
	4) Lack of human resources (skilled labour, trainer, engineer, and young farmer)	Severe
	5) Lack of collective activities and modernization in agriculture and fishery	Very Severe
	6) High operational cost (animal feed, material, and electricity)	Very Severe
	7) Insufficient financing opportunity	Severe
Value chain	8) Insufficiency of value chain in the South	Very severe
	9) Lack of supporting industry	Very severe
Infrastructure	10) Insufficiency of infrastructure	Severe
Governmental support	11) Insufficiency of governmental supports and delay in administrative procedures	Severe

Source: JET

(c) Potentials

As mentioned in Table 3.2-2, there is much room for further governmental support and intervention for agricultural development of the South. Given the above, the cluster development under public initiative (Scenario 3) proposed in Chapter 2 could contribute to overcome constraints such as lack of human resource, lack of collective activities, high cost, lack of value chain, insufficiency of infrastructure, and insufficiency of governmental support. In addition, based on the result of the diamond analysis and field survey conducted by JET, the four approaches shown in Table 3.2-3 are recommended for tackling the above constraints and for maximizing value added to the proposed products through utilization of unique local resources in the South.

Table 3.2-3 Recommended approach for tackling the constraints

Approach		Objective	Constraints to which the approach contributes to their improvement
1	Reinforcement and sophistication of value chain	This approach is to promote how to make larger profit from each phase of value chain (e.g., production, processing, packaging, transport, selling, export, etc.) in the Southern Region.	-Insufficiency of value chain
2	Development of industrial bases for food processing	This approach enables manufacturers and factories to enjoy the merit of proximity to supporting industries and logistic bases and effective use of infrastructure.	-Lack of supporting industry -Insufficiency of infrastructure
3	Further promotion of using unique local resources	This approach is to make the most of unique local resources (e.g., local varieties of plants, organic substance, etc.) to create more value added.	-Limitation of water resource -Limitation of farmland -Limitation of aquatic resources -High operational cost
4	Introduction of modernized agricultural technology for sustainable development	This approach is to take advantage of modern technology (e.g., water saving irrigation system, water-retaining material, energy saving electric pump, etc) for efficient and sustainable use of limited resources.	-Lack of collective and modernized agriculture and fishery -Limitation of water resource -Limitation of farmland -Limitation of aquatic resources -Lack of human resources

Source: JET

Major products which are considered to have high potential are summarized as shown in Table 3.2-4.

Table 3.2-4 Major products expected to have potential in the South and approaches for promotion

Products considered to have high potential	Recommended approaches for promotion considering local characteristics of the South			
	Reinforcement and sophistication of value chain	Development of industrial cluster for food processing	Further promotion of using unique local resources	Introduction of modernized technology for sustainable development
1) Dates	○	○	○	○
2) Olive oil	○	○	○	
3) Other arboriculture products	○	○		
4) Off-season vegetables	○			○
5) Newly developing local products			○	
6) Chicken, milk and dairy products	○	○	○	
7) Aquaculture and fish processing products	○	○		

Source: JET

(2) Strategies and plans

Based on the results of the diamond analysis and the major constraints and potentials identified for the promotion of agricultural development, the six (6) strategies shown in Table 3.2-5 and in the detailed explanation which follows shall be proposed.

Table 3.2-5 Agricultural Strategy for development of the Southern Region

Code	Strategy	Effect (Direct / Indirect)			Indicator
		Value-added	Job creation	Sustainability	
AG-1	Maximization of productivity of dates under the condition of rare water resource	<ul style="list-style-type: none"> Increase of profit through saving cost, increasing productivity, and selling products at higher price. 	<ul style="list-style-type: none"> Creation of jobs for producers of specified products 	<ul style="list-style-type: none"> Achieving sustainable and effective use of rare local resources such as water and organic substances 	<ul style="list-style-type: none"> Percentage of the installation of water- saving irrigation system Yield amount of dates per unit water Percentage of export price increase Percentage of cost decrease Implementation ratio of training courses
AG-2	Increasing the value added to olive oil by brand establishment and quality improvement	<ul style="list-style-type: none"> Increase of profit through saving cost of chemical fertilizer and agricultural chemicals, and enhancing brand value 	<ul style="list-style-type: none"> Creation of jobs for producers of specified products 		<ul style="list-style-type: none"> Percentage of bottled olive oil Value added of olive oil Percentage of oil mills operated under recommended quality control and logistics system agricultural product Percentage of the products meeting the requirements of international certificates Implementation ratio of training courses
AG-3	Increasing the value added to livestock breeding/aquaculture products by maximizing productivity of animal feed, quality improvement, and promotion of collective activities	<ul style="list-style-type: none"> Increase of profit through saving cost, increasing productivity, and selling products at higher price. 	<ul style="list-style-type: none"> Creation of jobs for producers of specified products 	<ul style="list-style-type: none"> Achieving sustainable and effective use of rare local resources such as organic substances 	<ul style="list-style-type: none"> The percentage of compound feed made of local organic substances and corresponding to development stages of livestock The number of processing/storage bases The number of breeders' groups Percentage of breeders who installed new technology, equipment and system
AG-4	Promotion of other promising products, technology, and organizations for efficient and sustainable agriculture	<ul style="list-style-type: none"> Increase of production and sales through commercialization of promising products 	<ul style="list-style-type: none"> Creation of new jobs related to introduced products, technology, and organizations 	<ul style="list-style-type: none"> Economizing energy and resource consumed in food processing activity 	<ul style="list-style-type: none"> Number of pilot projects of promising products Implementation ratio of diffusion seminar on the installation of recommended agricultural technology Percentage of farmers' groups playing multiple roles
AG-5	Establishment of bases for food processing and circulating use of local organic substances	<ul style="list-style-type: none"> Increase of profit through saving cost, increasing productivity, and selling products at higher price. 	<ul style="list-style-type: none"> Creation of new jobs related to food processing and supporting industry Improvement of the situation of seasonal employment 	<ul style="list-style-type: none"> Achieving sustainable use of local organic substances 	<ul style="list-style-type: none"> Basic infrastructure development of the entire target industrial zones The number of factories newly established related to food processing Local development plan of each industrial zone and adjacent area
AG-6	Promotion of multifunctional use of oasis and other agricultural and pastoral area	<ul style="list-style-type: none"> Increase of production volume and water efficiency of oasis agriculture 	<ul style="list-style-type: none"> Creation of new jobs related to the service provided in oasis and other agricultural area 	<ul style="list-style-type: none"> Achieving sustainable management of oasis and agricultural area 	<ul style="list-style-type: none"> Percentage of oasis in which irrigation system is renewed Area of pasture land covered by the development program Development of production and processing base for red meat and raw material for handicraft

Source: JET

(a) AG-1: Maximization of added value productivity of dates under the condition of rare water resource

(i) Objective of the strategy

To increase value added considering the potential and constraints of the Southern Region, it is important to focus on limited local resources in the South and to figure out how to maximize the productivity of the resources. The scarcest and rarest resource in the South is water, and economizing water consumption and increasing productivity of water seems to be the closest way to maximize value added of dates, bringing one of the highest value additions in agricultural sector of the Southern Region. Dissemination of water-saving irrigation system and expansion of cultivation area by use of partial quantity of saved water are promising strategies for job creation and sustainability of agriculture.



Water-saving irrigation system

(ii) Direct/Indirect Effect

The strategy will target the following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Increase of profit through saving cost, increasing productivity, and selling products at higher price
- 2) Creation of jobs for producers of specified products
- 3) Achieving sustainable and effective use of rare local resources such as water and organic substances

(iii) Indicators

In order to measure the effect and impact of the strategy, the following indicators are proposed:

- 1) Water-saving irrigation system will be renewed or installed in 80% of dates cultivation area by 2025.
- 2) Yield amount of dates per unit water (m^3) will be doubled by 2025.
- 3) The ratio of the price of dates for average export price of the date from Tunisia (average export price / Tunisia product price) will increase by 30% by 2025.
- 4) Average material cost and deprecation of water-saving irrigation system per unit quantity of date will decrease by 30% by 2025.
- 5) Number of farmers enjoying public financial support will be doubled by 2025.
- 6) Structure for monitoring the physical productivity of water for dates will be established by 2025.
- 7) Training courses regarding new agricultural technology will be established and implemented in all six governorates.

(iv) Development Plan

<AG-1-1: Increasing physical productivity of water for dates >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-1-1-1: Collection and analysis of data on existing water-saving irrigation system
- AG-1-1-2: Examination of several water-saving irrigation models
- AG-1-1-3: Establishing standard for water-saving irrigation model including the method to prevent salt damage

Mid-term (2020–2025):

- AG-1-1-4: Dissemination of the model of water-saving irrigation system

< AG-1-2: Increasing value of dates >

The plan will be realized through implementing the following actions:

Short-term (2015-2020):

- AG-1-2-1: Organizing dates quality improvement conference composed of farmers, processors, governmental bodies and others
- AG-1-2-2: Quality improvement focusing on problems identified in each phase of dates production
- AG-1-2-5: Introduction of geographical identification (GI) for the branding of dates product
- AG-1-2-8: Research and development for the commercialization of dates processing products and minor varieties other than Deglet Nour

Short- to Mid-term (2015–2025):

- AG-1-2-3: Establishing and disseminating models of cultivation and processing to enhance quality
- AG-1-2-4: Disseminating organic cultivation and securing traceability of dates
- AG-1-2-6: Further localization of sorting and storage of dates
- AG-1-2-7: Promotion of the development of complete factories of dates located in the Southwest

< AG-1-3: Decreasing production cost >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-1-3-1: Introduction of standardized materials and equipment necessary for dates cultivation
- AG-1-3-2: Introduction of energy-saving equipment (e.g., electric water pump with an inverter, etc.)
- AG-1-3-3: Promotion of group purchase of standardized materials and equipment

Short- Mid-term (2015–2025):

- AG-1-3-4: Founding subsidy and/or public loan system to promote the introduction of water-saving irrigation system

< AG-1-4: Provision of further financial and material support to farmers in proportion to physical productivity of water for dates >

The plan will be realized through implementing the following actions:

Short- Mid-term (2015–2025):

- AG-1-4-1: Establishing the structure for monitoring the physical productivity of water for dates
- AG-1-4-2: Providing further financial and material support to farmers in proportion to physical productivity of water for dates

< AG-1-5: Capacity building of farmers and farmers' group >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-1-5-1: Implementing vocational training on new cultivation technology for young farmers and candidates
- AG-1-5-2: Implementing training to promote and manage farmers groups of selected farmers

(b) AG-2: Increasing the value added to olive oil by brand establishment and quality improvement

(i) Objective of the strategy

Necessity of the maximization of productivity of specific resources can be addressed in view of the promotion of specific products. As for olive oil, it is one of the most effective methods to maximize the value of brand equity which can be recognized as a rare resource for the increase of value added. For this purpose, consistent marketing is also required based on STP (Segmentation, Targeting and Positioning), because the amount of export of Tunisian olive oil is ranked as the fourth in the global market. In the other words, Tunisia needs to apply niche marketing. The shift from bulk to bottled olive oil production will also contribute to the increase the value added to olive oil products. Bottled olive oil produced under appropriate quality control has two times larger value added than that provided in bulk even after reducing bottling cost. Therefore, combining with improved brand equity the increase in sales ratio of bottled product in the total sales amount is effective action plan. For this purpose, it is required to promote group purchase of packaging materials such as bottle, cap and label and to enhance the linkage between bottlers and oil press factories. This linkage in the supply chain of olive oil has important role in ensuring high sales ratio of bottled product. And, there is much room for commercialization of second press oil from pomace compared with the products of Italy.

(ii) Direct/Indirect Effect

The strategy will target the following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Creation of jobs for producers of specified products
- 2) Increase of profit through saving cost of chemical fertilizer and agricultural chemicals, and enhancing brand value

(iii) Indicators

In order to measure the effect and impact of the strategy, the following indicators are proposed:

- 1) Percentage of bottled olive oil will increase from 12% to 25% by 2025.
- 2) Value added of olive oil will increase by 30% by 2025.
- 3) 80% of oil mills will operate under recommended quality control and logistics system by 2025.
- 4) Platform for knowledge exchange among olive farmers will be established by 2025.
- 5) Subsidy system will be revised by 2025.
- 6) More than 50% of agricultural cooperatives will implement group purchase of materials and equipment by 2025.
- 7) The conference composed of existing or newly established oil bottlers, olive farmers, and oil press factories will be established and operated in each governorate by 2025.
- 8) Production of second-pressed olive oil made from pomace will be expanded to more than 50% of oil mills by 2025.
- 9) Training courses regarding new agricultural technology will be established and implemented in all 6 governorates.

(iv) Development Plan

< AG-2-1: Enhancement of brand value of olive oil >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-2-1-1: Planning marketing of olive oil through implementation of STP (Segmentation, Targeting, Positioning)
- AG-2-1-2: Executing continuous sales promotion targeting niche market

Short- Mid-term (2015–2025):

- AG-2-1-3: Differentiating oil product (high polyphenol olive oil for health oriented customers, etc.)
- AG-2-1-4: Promotion of the shift from bulk production to bottled production
- AG-2-1-5: Evaluation and review of the implemented actions for enhancement of brand value of olive oil

< AG-2-2: Improvement of the quality of olive oil and stability of olive oil production >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-2-2-1: Further promotion of cold press in order to improve product quality
- AG-2-2-2: Shortening lead time between harvest and processing
- AG-2-2-4: Strengthening the resilience of olive production

Short- to Mid-term (2015–2025):

- AG-2-2-3: Further dissemination of organic cultivation and securing traceability of olive and

olive oil

- AG-2-2-5: Restructuring of subsidies for the promotion of high value added olive oil instead of subsidy to increase quantity of olive tree
- AG-2-2-6: Evaluation and review of the actions implemented for quality improvement of olive oil

< AG-2-3: Enhancement of bottled olive oil sale and second pressing oil product >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-2-3-1: Promotion of group purchase of materials (bottle, cap, label, etc.)
- AG-2-3-2: Enhancing linkage between oil mills and bottlers

Short- to Mid-term (2015-2025):

- AG-2-3-3: Increasing the ratio of commercialized second pressing olive oil by use of pomace
- AG-2-3-4: Evaluation and review of the actions implemented for enhancement of bottled olive oil sales

< AG-2-4: Capacity building of farmers and farmers' groups >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-2-4-1: Implementing vocational training on new cultivation technology for young farmers and candidates
- AG-2-4-2: Implementing training to promote and manage farmers groups of selected farmers

(c) AG-3: Increasing value added of livestock breeding/aquaculture products by maximizing productivity of animal feed, quality improvement, and promotion of collective activities

(i) Objective of the strategy

To save the cost of livestock breeding and aquaculture, local organic substances after proper processing can be partly substituted to expensive animal feed which is one of the most serious constraints and burdens for breeders and whose price can be unexpectedly changed due to the fluctuation of international market price. In addition, the cost of mainly imported animal feed can be reduced through procuring it in a large quantity and transport it via a commercial port in or closer to the Southern Region. Furthermore, there is much room to increase the value of

livestock/aquaculture products in the Southern Region, because the products at present do not necessarily have a merit of economic scale due to dispersed production bases. As for organization, the number of breeders' groups producing livestock/aquaculture products is still low compared to that of



Cow farm (Gabes)

farmers' groups in the Southern Region. But, breeders' groups should also be promoted to enjoy the merit of collective activity to reduce cost, to increase productivity, and to improve quality of the products through collective procurement, production, quality control, sales, and export.

(ii) Direct/Indirect Effect

The strategy will target the following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Increase of profit through saving cost, increasing productivity, and selling products at higher price
- 2) Creation of jobs for producers of specified products
- 3) Achieving sustainable and effective use of rare local resources such as organic substances

(iii) Indicators

In order to measure the effect and impact of the strategy, the following indicators are proposed:

- 1) The percentage of compound feed made of local organic substances and corresponding to development stages of livestock will increase up to 10% of all animal feed consumption by 2025.
- 2) Commercial port through which animal feed can be imported will be developed.
- 3) The processing/storage bases under recommended quality control and logistics system will be developed in each Governorate by 2025.
- 4) More than 5 good practices of the commercialization of new products in each Governorate will be realized by 2025.
- 5) More than 3 breeders' groups for collective procurement and sales will be established in each Governorate by 2025.
- 6) More than 50% of breeders will install new technology, equipment and system by 2025.

(iv) Development Plan

< AG-3-1: Increasing productivity of animal feed >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015–2025):

- AG-3-1-1: Study on the compound feed made of local organic substances including proportion of variable and adequate ingredients by development stage
- AG-3-1-2: Promotion of the production of forage crops by local farmers (e.g., alfalfa, barley, sorghum, etc.)
- AG-3-1-3: Financial support to livestock breeders/aquaculture farmers for equalization of seasonal difference of the cost of animal feed

Mid-term (2020–2025):

- AG-3-1-4: Establishment of collective procurement system of animal feed via a commercial port in the South
- AG-3-1-5: Evaluation and review of the actions implemented for increasing productivity of animal feed

< AG-3-2: Increasing the quality and value of livestock /aquaculture products >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-3-2-1: Development of processing/storage bases and logistics network for mass processing of livestock /aquaculture products
- AG-3-2-2: Quality improvement focusing on each phase of value chain
- AG-3-2-3: Study on local species of livestock/aquaculture products in view of genetic advantage, uniqueness, and high value added



Mid-term (2020–2025):

- AG-3-2-4: Development of tracing system to secure traceability of livestock/aquaculture products
- AG-3-2-5: Evaluation and review of the actions implemented for improvement of quality and value of livestock/aquaculture products

< AG-3-3: Promotion of collective activity and capacity development of livestock breeders/aquaculture farmers >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015–2025):

- AG-3-3-1: Further promotion of the establishment of breeders' group
- AG-3-3-2: Promotion of collective procurement of feed and materials
- AG-3-3-3: Promotion of collective sales activity
- AG-3-3-4: Introduction of new technology, equipment and system including operational training for livestock breeders/aquaculture farmers

(d) AG-4: Promotion of other promising products, technology, and organizations for efficient and sustainable agriculture

(i) Objective of the strategy

Though securing water is a prerequisite, it is one of the promising methods to promote minor agricultural products which have high value and demand in international market. Agricultural products such products as moringa, spirulina, and other medicinal and aromatic plants, livestock breeding products such as rabbit, quail, and bee for, and tilapia, tuna, and aquaculture products such as shrimp can be proposed considering natural condition of the South. In addition, to equalize labour demand during a year in the South, production of vegetable whose high season is different from that of olive and dates (during October-January) may be promoted, taking advantage of hot spring water and geothermal greenhouse.

As for technology, innovative agricultural technology and equipment need to be diffused to tackle constraints in the Southern Region such as water scarcity and low energy efficiency. It means not only

the introduction of modernized technology but also re-evaluation of traditional but eco-friendly and efficient technology such as Jessours for irrigation.

	
<p>Moringa tree on irrigated farmland (Tataouine)</p>	<p>Agricultural material shop managed by cooperative (Kébili)</p>

As for organizations, though the number of farmers' groups such as agricultural cooperatives and mutual companies is gradually increasing in recent years, organization of the farmers' groups needs to be further promoted for more effective and efficient management of agriculture, livestock breeding and fishery. Organizing the farmer's group enables members (farmers) to reduce cost, to increase productivity, to increase export, and to improve quality of the products through collective procurement, production, and sales.

(ii) Direct/Indirect Effect

The strategy will target the following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Increase of production and sales through commercialization of promising products
- 2) Creation of new jobs related to introduced products, technology, and organizations
- 3) Economizing energy and resource consumed in food processing activity

(iii) Indicators

In order to measure the effect and impact of the strategy, the following indicators are proposed:

- 1) More than 5 pilot projects of the production of agricultural/livestock/marine products and promising local species will be implemented in each governorate by 2025.
- 2) Diffusion seminar on the installation of recommended agricultural technology will be held in more than 80% of agricultural cooperatives and GDAs by 2025.
- 3) Legal structure for financial support to farmers who install recommended agricultural technology will be developed by 2025.
- 4) More than 80% of farmers' groups will play multiple roles in various activities such as group procurement, group production, and group logistics by 2025.

(iv) Development Plan

< AG-4-1: Introduction and promotion of promising products >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015-2025):

- AG-4-1-1: Introduction and promotion of promising agricultural products (e.g., medicinal and aromatic plants, vegetables made by geothermal greenhouse, etc.)
- AG-4-1-2: Further promotion of promising livestock breeding products (e.g., rabbit, quail, bee, and other rare local species)
- AG-4-1-3: Introduction and promotion of promising aquaculture products (e.g., tilapia, tuna, shrimp, and other rare local species)
- AG-4-1-4: Further research and development for commercialization of promising local species

< AG-4-2: Introduction and promotion of innovative agricultural technology >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-4-2-1: Further diffusion of decentralized water desalination system with PV panel
- AG-4-2-2: Renew and re-evaluation of existing agricultural equipment and materials (e.g., energy-saving water pump, traditional irrigation system “*Jessours*”)

Short- to Mid-term (2015–2025):

- AG-4-2-3: Diffusion of innovative water-saving materials and agricultural methods (e.g., polymer gel for soil, film farming system, etc.)

<AG-4-3: Promotion of the establishment and enhancement of farmers' groups (cooperatives, mutual companies, professional groups, etc.) >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-4-3-1: Dissemination of good practices and advantages of agricultural cooperatives and mutual companies
- AG-4-3-2: Reinforcement of the function of existing GDAs

Short- to Mid-term (2015-2025):

- AG-4-3-3: Further promotion of the establishment of agricultural material shops for collective and efficient procurement
- AG-4-3-4: Promotion of collective production and sales by agricultural organization
- AG-4-3-5: Establishment of professional farmers’ groups by product for capacity development of farmers and other farmers’ groups <Governorate>

(e) AG-5: Establishment of bases for food processing and circulating use of local organic substances

(i) Objective of the strategy

Food processing is one of the effective methods to increase the value added to raw agricultural products, and there are many types of agricultural products in the South which are suitable for processing such as olive in Medenine, red meat in Tataouine, and dates in Kebili and Tozeur. In addition, by forming an

industrial cluster of food processing, factories can enjoy the merit of proximity to supporting industries and logistic bases, and effective use of infrastructure. There is much room for new development of industrial cluster of food processing in the existing industrial zones of the Southern Region, but the infrastructure needs to be further developed enough for food processing factories to start their operation. In addition, proposed food processing cluster in and around the target industrial zones can be enhanced through the promotion of the attraction of supporting industries.



In addition, every party produces organic waste such as olive oil residue from oil factory, olive leaf from olive farmer, poultry manure from chicken farmer, cow manure from cow farmer, waste product from broiler factory and canning factory of sardine and tuna. These waste substances are used by each party partially. However, if the parties create linkages among them, these waste substances can be used for compound feed and fertilizer efficiently. The cluster intends to create linkage among them and enhance profitability and differentiation of products.

(ii) Direct/Indirect Effect

The strategy will target the following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Increase of profit through saving cost, increasing productivity, and selling products at higher price
- 2) Creation of new jobs related to food processing and supporting industry
- 3) Improvement of the situation of seasonal employment

(iii) Indicators

In order to measure the effect and impact of the strategy, the following indicators are proposed:

- 1) Basic infrastructure of the entire target industrial zones for food processing cluster will be sufficiently developed in each governorate by 2025.
- 2) More than 2 food processing factories will be newly established in each governorate by 2025.
- 3) Local development plan of each industrial zone and adjacent area of each governorate will be proposed by 2025.
- 4) Compost station will be developed and properly operated in each delegation by 2025.
- 5) Rendering station will be developed and properly operated in each governorate by 2025.

(iv) Development Plan

< AG-5-1: Rehabilitation of existing industrial zone >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-5-1-1: Rehabilitation of infrastructure in and around the existing industrial zone

Mid-term (2020–2025):

- AG-5-1-2: Promotion of the attraction of food processing factories related to major agricultural products produced around the industrial zone
- AG-5-1-3: Promotion of the attraction of supporting industries
- AG-5-1-4: Evaluation and review of the actions implemented for activation of existing industrial zone

< AG-5-2: Reinforcement of the linkage among local farmers, food processing factories and supporting industries >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015–2025):

- AG-5-2-1: Organizing and running of the conference of interest parties related to the cluster
- AG-5-2-2: Examination of local development plan contributing to the reinforcement of linkage among local farmers, food processing factories and supporting industries in and around each industrial zone

< AG-5-3: Promotion of circulating use of local organic substances in and around the bases >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-5-3-1: Establishment of compost station, organic waste collecting network, and organic fertilizer distribution network
- AG-5-3-3: Study on fertilizer made from poultry and cow manure for the production of quality dates and olive
- AG-5-3-4: Further promotion of utilization of local organic substances and sub-products (e.g., leaves, branches, seeds of olive and dates, seaweeds, etc.)

Mid-term (2020–2025):

- AG-5-3-2: Establishment of rendering station for further reuse of organic waste as animal feed (e.g., olive pomace, irregular dates, residue of meat/fish processing factory, etc.)
- AG-5-3-5: Evaluation and review of the actions implemented for promotion of circulating use of local organic substances

(f) AG-6: Promotion of multifunctional use of oasis and other agricultural and pastoral area

(i) Objective of the strategy

Agricultural land such as oasis and pastureland can be utilized not only for agriculture and/or livestock breeding but also for the activation of local economy.

Triple-layered oasis composed of dates (upper layer), arboriculture (middle), and forage crops and vegetables (lower) is well known as traditional oasis in the South, but there is much room for improvement in view of productivity, water consumption, and collective activity of farmers. Under the operation of water-saving irrigation system and the cooperation among farmers, commercialization of agricultural products from each layer and enhancement of the linkage among forage farming and livestock breeding, and oasis waste and handicraft sector can be proposed.

In addition, pastureland in the Southern Region plays an important role as the basis of livestock breeding and countermeasure for desertification. In addition to the project for development and preservation of pastureland being implemented by OEP, project on multifunctional usage of pastureland in line with livestock breeding, food processing, and handicraft can be proposed.



Triple-layered oasis (Tozeur)
(Upper: dates, middle: fig, lower: forage crops)



Pastureland development project site
(OEP Kebili)

(ii) Direct/Indirect Effect

The strategy will target the following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Increase of production volume and water efficiency of oasis agriculture
- 2) Creation of new jobs related to the service provided in oasis and other agricultural area
- 3) Achieving sustainable management of oasis and agricultural area

(iii) Indicators

In order to measure the effect and impact of the strategy, the following indicators are proposed:

- 1) Infrastructure for irrigation will be renewed or rehabilitated in an eco-friendly manner in 80% of oasis in each governorate by 2025.
- 2) Network for collective activities among triple-layered oasis farmers will be established by 2025.
- 3) Area of pastureland covered by the development program will be doubled by 2025.
- 4) Production and processing base for red meat and raw material for handicraft will be developed and properly operated in Tataouine by 2025.

(iv) Development Plan

< AG-6-1: Promotion of multifunctional use of existing oases >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-6-1-2: Promotion of collective activities to increase productivity among triple-layered oasis farmers
- AG-6-1-3: Promotion of activities in oases taking advantage of the uniqueness and biodiversity

Short- to Mid-term (2015–2025):

- AG-6-1-1: Rehabilitation and improvement of irrigation infrastructure of triple-layered oases

< AG-6-2: Further development and sustainable management of pastureland in combination with livestock breeding, food processing, and handicraft >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- AG-6-2-1: Enhancement of pastureland development program being implemented by OEP

Short- to Mid-term (2015–2025):

- AG-6-2-2: Promotion of livestock breeding for red meat processing and production of raw materials for handicraft
- AG-6-2-3: Establishment of logistic service for integrated activities of pastureland development, livestock breeding, food processing, and handicraft

(3) Action plans

Action plans are shown in action plan sheets attached at the end of this subsection 3.2.1. As for some actions which should be implemented by/in specific unit (e.g., organization of farmers' groups at delegation level, group procurement at region level, etc.), recommended units are shown in the sheet as "Delegation", "Governorate", and "Region".

(4) Estimation of job creation by the implementation of the strategies

Method of the estimation of job creation by the implementation of the strategies is shown in Table 3.2-6.

The number of jobs to be created through the implementation of AG-1 and AG-2 was estimated by setting "the target production volume increase of each product (dates for AG-1 and olive oil for AG-2)" divided by "unit production volume per labor". On the other hand, the jobs of AG-3 to AG-6 were estimated as accumulation of estimated number of job creation of each plans and action plans, because each strategy covers multiple agricultural products.

In addition, the estimation is based on the precondition that the implementation of the strategy in inland Governorates (Tataouine, Gafsa, Kebili, and Tozeur) is politically favored to decrease disparities between inland area and coastal area, as long as the products to be promoted are suitable to the condition of the target governorate.

Table 3.2-6 Method of the estimation of job creation by strategy

Strategy	Method of estimation	Remark
AG-1: Maximization of productivity of dates under the condition of rare water resource	Target volume of production increase by 2035 (100,000t of dates)/ Unit volume per labor (30t/ppl)	Unit volume per labor is set based on the result of interview with farmers in the Southern Region.
AG-2: Promotion of high value-added agriculture through branding, organic agriculture and quality improvement	Target volume of production increase by 2035 (10,000t of olive oil)/ Unit volume per labor (5t/ppl)	
AG-3: Increasing value added of livestock breeding/aquaculture products by maximizing productivity of animal feed, quality improvement, and promotion of collective activities	Accumulation of estimated number of job creation of each plans and action plans (e.g., increase of worker for mass processing base of livestock products in each governorate, increase of forage crops producers, etc.)	The estimation is based on the precondition that the implementation of the strategy in inland area (Tataouine, Gafsa, Kebili, and Tozeur) is politically favored to decrease disparities between inland area and coastal area.
AG-4: Promotion of other promising products, technology, and organizations for efficient and sustainable agriculture	Accumulation of estimated job creation of each plans and action plans (e.g., increase of producers of promising agricultural, livestock and aquaculture products, business expansion by the installation of innovative agricultural technology, etc.)	
AG-5: Establishment of bases for food processing and circulating use of local organic substances	Accumulation of estimated job creation of each plans and action plans (e.g., increase of worker for food processing factories to be developed in the industrial zone, worker for compost station and rendering station to be developed, etc.)	
AG-6: Promotion of multifunctional use of oasis and other agricultural and pastoral area	Accumulation of estimated job creation of each plans and action plans (e.g., increase of worker for pastureland development, red meat processing, and production of raw materials for handicraft, etc.)	The estimation is based on the precondition that the implementation of the strategy AG-6-2 in Tataouine is politically favored as the most suitable governorate for pastureland development and livestock promotion.

Source: JET

Given the above, the expected number of jobs to be newly created by 2035 by the implementation of the strategies is estimated at 14,890 as shown in Table 3.2-7. In addition to this, the number of indirect employment in relation to implementation of the strategies is also expected to be added separately.

Table 3.2-7 Expected number of jobs (direct employment) to be newly created by 2035
(Unit: ppl)

Strategy	Medenine	Tataouine	Gabes	Gafsa	Kebili	Tozeur	Total
AG-1	500	-	-	-	2,030	1,130	3,660
AG-2	1,650	160	220	280	-	-	2,310
AG-3	100	270	70	70	80	80	670
AG-4	400	900	1,400	890	880	780	5,250
AG-5	360	160	610	550	140	140	1,960
AG-6	50	550	120	120	100	100	1,040
Total	3,060	2,040	2,420	1,510	3,230	2,230	14,890

Source: JET

(5) Recommendations for the promotion of agriculture sector in the Southern Region

Since some of the agriculture promotion issues in the Southern Region are not matters of only regional level concern but also that of national level concern, two recommendations are made to public bodies at national level as shown below.

(a) Recommendation for capacity development of priority organizations and necessary legislative modification

The importance of capacity development of farmers and other relevant bodies in agriculture sector is emphasized not only by JET but also by Tunisian side. In relation to this, actions for capacity development of farmers/breeders, private groups, public bodies, and local research institutes are proposed in the strategies and plans of agriculture sector. For a better implementation of actions taking advantage of limited resources, it is recommended for Tunisian side to prioritize organizations which are the targets of capacity development. URAP, GDA, professional groups, and SMSA (mutual company of agricultural service) and so on are proposed as candidate organizations to be given priority in the discussion of P/Cs. In addition, if there is any legislative insufficiency which can be constraints for organizations and can hinder activities of candidate organizations, legislative structure should be modified to enable local private bodies to organize more active, flexible, productive and effective farmers' groups.

(b) Recommendation for further financial support to farmers who are facing real estate issue

Real estate issue (land ownership issue) is one of the most serious issues in Tunisia especially in the Southern Region in terms of agricultural land use and the lack of collateral for farmer's loan/finance. The Ministry of State Properties and Land Affairs has been tackling the issue, but it seems to take time to resolve it due to its sensitivity and complex historical and cultural backgrounds. For further financial support to farmers who are facing financial difficulty due to real estate issue, it is highly recommended that APIA and financial institutes such as BNA, BFPME, etc. offer funds under the scheme of group funding whose collateral is not limited to a land under personal ownership. In addition, it is also recommended that the domain of activity of FOSDA (Special fund of agricultural development) supervised by CRDA should be enhanced so that not only individual farmers but also farmers' groups such as SMSA and GDA can access financial support as a group.

Sector	Strategy	AG-1	Maximization of added value productivity of dates under the condition of rare water resource		
	Plan	Actions <Recommended unit>		Term	Cost
Agriculture, livestock breeding, fishery and food processing	AG-1-1: Increasing physical productivity of water for dates	<ul style="list-style-type: none"> - AG-1-1-1: Collection and analysis of data on existing water-saving irrigation system - AG-1-1-2: Examination of several models of water-saving irrigation system - AG-1-1-3: Establishing standard model of water-saving irrigation including the method to prevent salt damage - AG-1-1-4: Dissemination of the model of water-saving irrigation system 		Short-Medium	32,000 TND /ha
	AG-1-2: Increasing value of dates	<ul style="list-style-type: none"> - AG-1-2-1: Organizing dates quality improvement conference composed of farmers, processors, governmental bodies and others - AG-1-2-2: Quality improvement focusing on problems identified in each phase of dates production - AG-1-2-3: Establishing and disseminating models of cultivation and processing to enhance quality - AG-1-2-4: Disseminating organic cultivation and securing traceability of dates - AG-1-2-5: Introduction of geographical identification (GI) for the branding of dates product - AG-1-2-6: Further localization of sorting and storage of dates - AG-1-2-7: Promotion of the development of complete factories of dates located in the Southwest - AG-1-2-8: Research and development for the commercialization of dates processing products and minor varieties other than Deglet Nour 		Short - Medium	-
	AG-1-3: Decreasing production cost	<ul style="list-style-type: none"> - AG-1-3-1: Introduction of standardized materials and equipment necessary for dates cultivation - AG-1-3-2: Introduction of energy-saving equipment (e.g., electric water pump with an inverter, etc.) - AG-1-3-3: Promoting group purchase of standardized materials and equipment <Region> - AG-1-3-4: Founding subsidy and/or public loan system to promote the introduction of water-saving irrigation system 		Short - Medium	-
	AG-1-4: Provision of further financial and material support to farmers in proportion to physical productivity of water for dates	<ul style="list-style-type: none"> - AG-1-4-1: Establishing the structure for monitoring the physical productivity of water for dates - AG-1-4-2: Provision of further financial and material support to farmers in proportion to physical productivity of water for dates 		Short - Medium	-
	AG-1-5: Capacity building of farmers and farmers' groups	<ul style="list-style-type: none"> - AG-1-5-1: Implementing vocational training on new cultivation technology for young farmers and candidates <Governorate> - AG-1-5-2: Implementing training to promote and manage farmers groups for selected farmers <Governorate> 		Short	-

Strategy	AG-1	Maximization of added value productivity of dates under the condition of rare water resource		
Plan	AG-1-1	Increasing physical productivity of water for dates		
Intervention Area	Kebili, Tozeur, Gabes, Gafsa, Tataouine		Implementing agency	Ministry of Agriculture, Water Resources and Fisheries, CRDA
Description				
<p>Dates production in the Southern Region needs to be promoted considering constraints such as the limitation of water resource and expansion of farmland. That is, maximization of added value productivity of dates should be achieved not by increasing the production volume through farmland expansion but by improving the quality and increasing productivity per unit volume of resources such as water.</p> <p>Though there are some good practices of dates producers who have installed and managed effective water-saving irrigation system, there is much room for further technical examination considering sustainability of triple-layered oasis agriculture, soil salinity, diseases, and moisture maintenance around dates palm, etc. For tackling these issues one by one, systematic approach composed of actions for current status analysis, demonstration activity of some promising irrigation systems, establishing standard model, and dissemination of water-saving irrigation system is proposed in this plan.</p>				
Action Plan				
Actions <Recommended unit>		Relevant organizations	Role	
<ul style="list-style-type: none"> - AG-1-1-1: Collection and analysis of data on existing water-saving irrigation system - AG-1-1-2: Examination of several models of water-saving irrigation - AG-1-1-3: Establishing standard model of water-saving irrigation including the method to prevent salt damage - AG-1-1-4: Dissemination of the model of water-saving irrigation system 		<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - CRDA - AVFA - CFPA - URAP - APIA - Financial institutions (BNA, BFPME, etc.) - GI fruits - Local research institutes (IRA, Technical Centre Dates of Kebili (CTD) and the Regional Agriculture Research Centre of Oasienne Degueche (CRRAO), etc.) - GDA - Farmers' groups (Cooperatives, mutual companies, etc.) < not limited > 	<ul style="list-style-type: none"> - CRDA and AVFA examine and introduce some models of water-and- energy-saving irrigation systems and good practices for date farmers and urge them to renew the old irrigation equipment. The result of technical examination of irrigation systems by local research institute such as IRA must be considered to maintain soil salinity after the installation of water saving irrigation system. - CFPA produces farmers and engineers who can properly operate and maintain the irrigation system. - Financial institutions and APIA give financial support to farmers for procurement and installation of the irrigation system. - CRDA and GDAs under technical support by local research institutes measure the share of irrigated farmland equipped with water-saving technology and added value per unit volume of water. - URAP and GDA disseminate the effectiveness and economic advantages of the irrigation system among farmers and farmers' groups. - GI Fruits and AVFA give technical advice to farmers according to the types of the irrigation system in order to produce quality dates enough to export. Examination of cultivation method by local research institutes must be considered. 	
Indicator			Risk	
<ul style="list-style-type: none"> - Water-saving irrigation system will be renewed or installed in 80% of dates cultivation area by 2025. - Yield amount of date per unit water (m³) will be doubled by 2025. 			<ul style="list-style-type: none"> - Illegal expansion of farmland of dates and overexploitation of ground water must be strictly regulated in order not to exploit water resource in an unsustainable way. 	

Strategy	AG-1	Maximization of added value productivity of dates under the condition of rare water resource	
Plan	AG-1-2	Increasing value of dates	
Intervention Area	Kebili, Tozeur, Gabes, Gafsa, Tataouine	Implementing agency	Ministry of Agriculture, Water Resources and Fisheries, Ministry of Industry, Energy and Mining, CRDA
Description			
<p>The price of Tunisian dates is placed in the medium rank in comparison with other competitors. Israeli and American dates are exported at twice the Tunisian price. Dates from Tunisia need improvement of the quality and the increase of the processing ratio in the producing area. For this purpose, it is required to organize quality improvement committee comprised dates farmers, processors, relevant governmental bodies and others. In addition, series of activities for increasing value of dates need to be done such as problem identification in production process, further diffusion of organic cultivation followed by securing traceability and branding; moreover, larger portion of added value should be shifted to the Southern Region through such activities as sorting, storage and final processing, most of which are done by companies outside of the South at present</p>			
Action Plan			
Actions <Recommended unit>	Relevant organizations	Role	
<ul style="list-style-type: none"> - AG-1-2-1: Organizing dates quality improvement conference composed of farmers, processors, governmental bodies and others - AG-1-2-2: Quality improvement focusing on problems identified in each phase of dates production - AG-1-2-3: Establishing and disseminating models of cultivation and processing to enhance quality 	<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - Ministry of Industry, Energy and Mining - CRDA - AVFA - CFPA - UTICA - URAP - APIA - IRA 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining and CRDA take the initiative to organize committee composed of companies and organizations related to dates production. - The conference composed of private companies, farmers, UTICA, URAP, etc. will be operated to coordinate opinions and requests from the members, to conduct collective activities for quality improvement, measure against dates' diseases, and group purchase of materials, etc. - Ministry of Industry, Energy and Mining and CRDA introduce good practices of dates farm and processing factory which produce quality products to farmers and private companies. 	
<ul style="list-style-type: none"> - AG-1-2-4: Disseminating organic cultivation and securing traceability of dates - AG-1-2-5: Introduction of geographical identification (GI) for the branding of dates product 	<ul style="list-style-type: none"> - Financial institutions (BNA, BFPME, etc.) - Farmers' groups (Cooperatives, mutual companies, etc.) - Private companies (operator of food processing factories) - Local research institutes (Technical Centre Dates of Kebili (CTD) and the Regional Agriculture Research Centre of Oasienne Degueche (CRRAO), etc.) - Local NGOs < not limited > 	<ul style="list-style-type: none"> - CRDA takes the initiative to promote organic agriculture through technical advice to meet international standard of organic products in cooperation with AVFA and URAP for diffusion to farmers, CFPA for technical training, and financial institutions and APIA for financial support to farmers and private companies. - Under the supervision of CRDA for dates production and Ministry of Industry, Energy and Mining for dates processing, farmers and private companies develop tracing system of the products corresponding to ISO 22005: 2007, "Traceability in the feed and food chain", as a base for branding of dates through geographical identification (GI). - APIA gives financial support to farmers and private companies for the procurement of equipment to operate tracing system. 	
<ul style="list-style-type: none"> - AG-1-2-6: Further localization of sorting and storage of dates - AG-1-2-7: Promotion of the development of complete factories of dates located in the Southwest 	<ul style="list-style-type: none"> - Local NGOs < not limited > 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining takes the initiative to develop facilities for sorting and storage of dates in the Southern Region - Ministry of Industry, Energy and Mining takes the initiative to attract or newly develop complete factories of dates in the Southwest Region. 	

<p>- AG-1-2-8: Research and development for the commercialization of dates processing products and minor varieties other than Deglet Nour</p>		<p>- IRA and other local research institutes in cooperation with farmers, farmers' groups, and private companies implement study and pilot project for commercialization of dates processing products such as jam, syrup, oil, etc.</p> <p>- Research institutes conduct research and development for commercialization of minor varieties of dates focusing on differentiative factors of nutrition and function.</p>
<p>Indicator</p>		<p>Risk</p>
<p>- The ratio of the price of dates for average export price of the date from Tunisia (average export price / Tunisia product price) will increase by 30% by 2025.</p>		<p>- Supply side of dates is rigid because date palm requires long time before they bear fruit. Stiff price competition may continue due to oversupply.</p>

Strategy	AG-1	Maximization of added value productivity of dates under the condition of rare water resource		
Plan	AG-1-3	Decreasing production cost		
Intervention Area	Kebili, Tozeur, Gabes, Gafsa, Tataouine		Implementing agency	Ministry of Agriculture, Water Resources and Fisheries, CRDA
Description				
For the increase of value added of dates, it is necessary to reduce costs of materials and equipment including water-saving irrigation system in addition to higher selling price of dates. The reduction of producing cost of date requires two steps: standardization of materials, and equipment and group purchase. These steps aim to enhance bargaining power based on mass buying. Furthermore, the introduction of water-saving irrigation system requires certain amount of investment. Accordingly, governmental financial support will be necessary to introduce water-saving irrigation system.				
Action Plan				
Actions <Recommended unit>		Relevant organizations		Role
<ul style="list-style-type: none"> - AG-1-3-1: Introduction of standardized materials and equipment necessary for dates cultivation - AG-1-3-2: Introduction of energy-saving equipment (e.g., electric water pump with an inverter, etc.) - AG-1-3-3: Promoting group purchase of standardized materials and equipment <Region> 		<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - CRDA - URAP - GDAs - APIA - Financial institutions (BNA, BFPME, etc.) - Farmers' groups (Cooperatives, mutual companies, etc.) 		<ul style="list-style-type: none"> - CRDA in cooperation with AVFA and URAP introduces standardized materials and equipment necessary for dates cultivation and energy-saving equipment such as electric water pump with an inverter to economize electricity cost. - CRDA takes the initiative to promote the organization of farmers groups to conduct collective activities for quality improvement, cost reduction in view of fertilization, mechanization, and labor force management, and group purchase of standardized materials, etc.
<ul style="list-style-type: none"> - AG-1-3-4: Founding subsidy and/or public loan system to promote the introduction of water-saving irrigation system 		< not limited >		
Indicator		Risk		
<ul style="list-style-type: none"> - Average material cost and depreciation of water-saving irrigation system per unit quantity of date will decrease by 30% by 2025. - Number of farmers enjoying public financial support will be doubled by 2025. 		<ul style="list-style-type: none"> - Water-saving irrigation system with great rate in total cost is achieved by imported petroleum products whose cost fluctuate according to international crude oil price - The durable term of water-saving irrigation facilities is largely shorter than expectation 		

Strategy	AG-1	Maximization of added value productivity of dates under the condition of rare water resource		
Plan	AG-1-4	Provision of further financial and material support to farmers in proportion to physical productivity of water for dates		
Intervention Area	Kebili, Tozeur, Gabes, Gafsa, Tataouine		Implementing agency	CRDA
Description				
<p>Considering the importance of increasing added value productivity of dates per unit volume of water and making the most of limited water resource in a sustainable manner, further financial and material supports need to be given to farmers who could achieve the increase of physical productivity of water for dates in proportion to their contribution. The supports could be done through preferential financial treatment by APIA and other financial institutions, and/or provision of agricultural materials such as desalination system with PV panel for high salinity water from shallow aquifer, seeds, fertilizer, plastic bags, etc. which contribute to the improvement of farmer's balance of payments.</p>				
Action Plan				
Actions <Recommended unit>		Relevant organizations		Role
<ul style="list-style-type: none"> - AG-1-4-1: Establishing the structure for monitoring the physical productivity of water for dates - AG-1-4-2: Provision of further financial and material support to farmers in proportion to physical productivity of water for dates 		<ul style="list-style-type: none"> - CRDA - URAP - GDA - APIA - Financial institutions (BNA, BFPME, etc.) - Farmers' groups (Cooperatives, mutual companies, etc.) < not limited > 		<ul style="list-style-type: none"> - CRDA in cooperation with local GDAs establishes the system for monitoring and calculation of physical productivity of water for dates (=production volume / water volume) for fair evaluation of water saving and production efficiency per unit volume of water. - In proportion to the result of water saving and the improvement of physical productivity of water for dates, further financial support is provided by APIA and financial institutions, and material supports such as free supply of seeds, desalination system with PV panel, and training of farmers are provided by CRDA in cooperation with URAP to motivate farmers to save water and increase productivity.
Indicator				Risk
<ul style="list-style-type: none"> - Structure for monitoring physical productivity of water for dates will be established by 2025. 				<ul style="list-style-type: none"> - Water usage including illegal one must be monitored by CRDA and GDAs.

Strategy	AG-1	Maximization of added value productivity of dates under the condition of rare water resource		
Plan	AG-1-5	Capacity building of farmers and farmers' groups		
Intervention Area	Kebili, Tozeur, Gabes, Gafsa, Tataouine		Implementing agency	Ministry of Agriculture, Water Resources and Fisheries, CRDA
Description				
Dissemination of new irrigation system and methods to improve date quality and to reduce product cost requires skilled farmer equipped with knowledge and some experience. This is a necessary condition to generate job opportunities in the southeast region. For this purpose, local training bodies need to provide opportunities to train young farmers and successors.				
Action Plan				
Actions <Recommended unit>		Relevant organizations		Role
<ul style="list-style-type: none"> - AG-1-5-1: Implementing vocational training on new cultivation technology for young farmers and candidates <Governorate> - AG-1-5-2: Implementing training to promote and manage farmers groups of selected farmers <Governorate> 		<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - CRDA - AVFA - CFPA - URAP - GDA - Local research institutes - International donors - Farmers' groups (Cooperatives, mutual companies, etc.) < not limited > 		<ul style="list-style-type: none"> - AVFA and CFPA under CRDA in cooperation with URAP and with technical support by international donors give training to young farmers, candidates, GDAs and farmers' groups on operation and maintenance of the new technology and equipment. To improve social condition of farmers, the training should contain the introduction of group insurance by cooperatives and safer agricultural technique. - In relation to capacity development of farmers and farmers' groups, capacity development of public bodies (CRDA, AVFA, CFPA, etc.) and local research institutes (IRA, Research Center of oasis cultures of Dégueche, etc.) are also implemented by the initiative of the Ministry of Agriculture, Water Resources and Fisheries, and international donors in order to enhance public-private partnership in agriculture sector as a whole.
Indicator				Risk
- Training courses regarding new agricultural technology will be established and implemented in all six Governorates.				- Massive young generation of farmers change their occupation apart from agriculture

Sector	Strategy	AG-2	Increasing value added of olive oil by brand establishment and quality improvement		
	Plan		Actions <Recommended unit>	Term	Cost
Agriculture, livestock breeding, fishery and food processing	AG-2-1: Enhancement of brand value of olive oil		<ul style="list-style-type: none"> - AG-2-1-1: Planning of marketing of olive oil through implementation of STP (Segmentation, Targeting, Positioning) - AG-2-1-2: Executing continuous sales promotion targeting niche market - AG-2-1-3: Differentiating oil product (high polyphenol olive oil for health oriented customers, etc.) - AG-2-1-4: Promotion of the shift from bulk production to bottled production - AG-2-1-5: Evaluation and review of the actions implemented for enhancement of brand value of olive oil 	Short - Medium	-
	AG-2-2: Improvement of the quality of olive oil and stability of olive oil production		<ul style="list-style-type: none"> - AG-2-2-1: Further promotion of cold press in order to improve product quality - AG-2-2-2: Shortening lead time between harvest and processing - AG-2-2-3: Further dissemination of organic cultivation and securing traceability of olive and olive oil - AG-2-2-4: Strengthening the resilience of olive production <Governorate> - AG-2-2-5: Restructuring of subsidies for the promotion of high value added olive oil instead of subsidy to increase quantity of olive tree - AG-2-2-6: Evaluation and review of the actions implemented for quality improvement of olive oil 	Short - Medium	-
	AG-2-3: Enhancement of bottled olive oil sales and second pressing oil product		<ul style="list-style-type: none"> - AG-2-3-1: Promotion of group purchase of materials (bottle, cap, label, etc.) <Region> - AG-2-3-2: Enhancing linkage between oil mills and bottlers <Governorate> - AG-2-3-3: Increasing the ratio of commercialized second pressing olive oil by use of pomace - AG-2-3-4: Evaluation and review of the actions implemented for enhancement of bottled olive oil sales 	Short - Medium	-
	AG-2-4: Capacity building of farmers and farmers' groups		<ul style="list-style-type: none"> - AG-2-4-1: Implementing vocational training on new cultivation technology for young farmers and candidates <Governorate> - AG-2-4-2: Implementing training to promote and manage farmers groups of selected farmers <Governorate> 	Short	-

Strategy	AG-2	Increasing value added of olive oil by brand establishment and quality improvement		
Plan	AG-2-1	Enhancement of brand value of olive oil		
Intervention Area	Medenine, Gafsa, Gabes, Tataouine	Implementing agency	Ministry of Industry, Energy and Mining	
Description				
Enhancement of brand value of olive oil will be one of the most effective methods to maximize added value of olive oil produced in the Southern Region considering the fact that large amount of olive oil are sold as bulk products at present without sufficient added value. For this purpose, systematic actions in marketing and production chain can be proposed which consist of marketing based on STP (Segmentation, Targeting and Positioning) and focusing on niche market, differentiation of olive oil in view of function, nutrition, and potential for processing, the shift from bulk production to bottled production.				
Action Plan				
Actions <Recommended unit>	Relevant organizations	Role		
<ul style="list-style-type: none"> - AG-2-1-1: Planning of marketing of olive oil through implementation of STP (Segmentation, Targeting, Positioning) - AG-2-1-2: Executing continuous sales promotion targeting niche market 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining - Ministry of Finance - Olive Oil Promotion Program (Under Ministry of Industry, Energy and Mining and Ministry of Finance) 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining and Ministry of Finance enhance financial support for production, sales, and export of bottled olive oil through the operation of Olive Oil Promotion Program Fund. - Private companies in cooperation with Olive Oil Promotion Program explore not only major markets such as EU, USA, Gulf, and Japan, but also niche markets such as Russia and China, etc. - Two or three major producers of bottled olive oil produce world's finest olive oil under political and financial supports by Olive Oil Promotion Program. 		
<ul style="list-style-type: none"> - AG-2-1-3: Differentiating oil product (high polyphenol olive oil for health oriented customers, etc.) 	<ul style="list-style-type: none"> - CEPEX - ODS - APII - Local research institutes (Olive Institute, etc.) - Private companies (Local oil mills, producers of bottled olive oil) 	<ul style="list-style-type: none"> - IRA and other local research institutes in cooperation with international donors conduct the research on local olive in the Southern Region focusing on differentiators such as specific function and nutrition of olive. The results of SATREPS (Science and Technology Research Partnership for Sustainable Development) project implemented by IRA and other institutes in Tunisia and JICA should also be taken into account. - Private companies in cooperation with IRA examine the possibility of commercialization of the olive which has specific nutritious aspect. 		
<ul style="list-style-type: none"> - AG-2-1-4: Promotion of the shift from bulk production to bottled production 	< not limited >	<ul style="list-style-type: none"> - ODS and APII take the initiative to attract olive oil bottlers to the Southern Region, especially to the existing industrial zone in Medenine. - Ministry of Industry, Energy and Mining takes the initiative to shift from the production of bulk to bottled olive oil considering promising market and customer segmentation of target countries. 		
<ul style="list-style-type: none"> - AG-2-1-5: Evaluation and review of the actions implemented for enhancement of brand value of olive oil 		<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining in cooperation with other relevant organizations evaluates and reviews the status of the implementation of the actions. The result of the review will be taken into account in making the next phase of development strategies, plans and action plans. 		
Indicator		Risk		
<ul style="list-style-type: none"> - Percentage of bottled olive oil will increase from 12% to 25% by 2025. - Value added of olive oil will increase by 30% by 2025. 		<ul style="list-style-type: none"> - Not identified 		

Strategy	AG-2	Increasing value added of olive oil by brand establishment and quality improvement	
Plan	AG-2-2	Improvement of the quality of olive oil and stability of olive oil production	
Intervention Area	Medenine, Gafsa, Gabes, Tataouine	Implementing agency	Ministry of Agriculture, Water Resources and Fisheries, CRDA
Description			
<p>When Tunisian olive oil is positioned in niche market, for example emerging countries such as Russia and China, certain differentiation of product is required especially in the quality. Three action plans to improve the quality are listed in the plan. The first is to promote cold press to hold aroma of olive and to prevent it from oxidization. The second action plan is to shorten lead-time from harvest to processing. This countermeasure aims to ensure optimum freshness of the final product. The third is to disseminate organic olive oil and to secure traceability of olive oil.</p> <p>In addition, the current policy of subsidy should change. The subsidy by local government to increase the number of olive trees should be changed to increase value added and to improve the quality of olive.</p>			
Action Plan			
Actions <Recommended unit>	Relevant organizations	Role	
<ul style="list-style-type: none"> - AG-2-2-1: Further promotion of cold press in order to improve product quality - AG-2-2-2: Shortening lead time between harvest and processing 	<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - CRDA - Ministry of Finance 	<ul style="list-style-type: none"> - CRDA in cooperation with local oil mills, olive farmers, farmers' groups, and URAP takes the initiative to improve the quality of olive oil through further promotion of cold pressing and efficient logistics of raw materials. 	
<ul style="list-style-type: none"> - AG-2-2-3: Further dissemination of organic cultivation and securing traceability of olive and olive oil 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining - AVFA - CFPA - URAP - Financial institutions (BNA, BFPME, etc.) - APIA - APII - Local research institutes - Private companies (Local oil mills, producers of bottled olive oil) 	<ul style="list-style-type: none"> - CRDA takes the initiative to promote organic agriculture through technical advice to meet international standard of organic products in cooperation with AVFA and URAP (diffusion to farmers), CFPA (technical training), and APIA (financial support). AVFA introduces methodology and good practices of conversion from agricultural chemical products to substitute products meeting with organic agriculture - Under the supervision of CRDA for olive and Ministry of Industry, Energy and Mining for olive oil, farmers and private companies develop tracing system of the products corresponding to ISO 22005: 2007, "Traceability in the feed and food chain". - APIA gives financial support to farmers and private companies for the procurement of equipment needed to operate tracing system. 	
<ul style="list-style-type: none"> - AG-2-2-4: Strengthening the resilience of olive production<Governorate> 	<ul style="list-style-type: none"> - Farmers' groups (Cooperatives, mutual companies, etc.) 	<ul style="list-style-type: none"> - CRDA in cooperation with local farmers shares local farmers' knowledge and good practices (e.g., knowhow for pruning, rainwater storage, best timing for fertilization, etc.) among stakeholders to make olive production bases more resilient. 	
<ul style="list-style-type: none"> - AG-2-2-5: Restructuring of subsidies for the promotion of high value added olive oil instead of subsidy to increase quantity of olive tree 	<ul style="list-style-type: none"> - < not limited > 	<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries and MoF change subsidy system to focus on the improvement of the quality of olive oil. - Financial institutions, APIA, and APII give farmers financial support to improve quality and increase value added. 	

<ul style="list-style-type: none"> - AG-2-2-6: Evaluation and review of the actions implemented for quality improvement of olive oil 		<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining in cooperation with other relevant organizations evaluates and reviews the status of the implementation of the actions. The result of the review will be taken into account in making the next phase of development strategies, plans and action plans.
Indicator		Risk
<ul style="list-style-type: none"> - 80% of oil mills will be operated under recommended quality control and logistics system by 2025. - Platform for knowledge exchange among olive farmers will be established by 2025. - Subsidy system will be revised by 2025. 	<ul style="list-style-type: none"> - Not identified 	

Strategy	AG-2	Increasing value added of olive oil by brand establishment and quality improvement	
Plan	AG-2-3	Enhancement of bottled olive oil sales and second pressing oil product	
Intervention Area	Medenine, Gafsa, Gabes, Tataouine	Implementing agency	CRDA, Ministry of Industry, Energy and Mining
Description			
<p>Considering high value added by bottling the olive oil which is two times larger than olive oil traded in bulk even after reducing bottling cost, there is much room for the promotion of bottled olive oil sales. Such activities as promotion of group purchase of necessary materials, developing rigid network among farmers, oil mills, and bottlers, and valorization of second-pressed olive oil which is not necessarily common in the Southern Region at present will contribute to enhance bottled olive oil sales and improve financial balance of payment of olive oil producers. The proposed actions need to be implemented along with the actions proposed (as AG-2-1) for the shift from bulk to bottled olive oil to enhance the synergy among actions.</p>			
Action Plan			
Actions <Recommended unit>	Relevant organizations	Role	
<ul style="list-style-type: none"> - AG-2-3-1: Promotion of group purchase of materials (bottle, cap, label, etc.) <Region> - AG-2-3-2: Enhancing linkage between oil mills and bottlers <Governorate> - AG-2-3-3: Increasing the ratio of commercialized second pressing olive oil by use of pomace - AG-2-3-4: Evaluation and review of the actions implemented for enhancement of bottled olive oil sales 	<ul style="list-style-type: none"> - CRDA - Ministry of Industry, Energy and Mining - CEPEX - AVFA - URAP - UTICA - APIA - Local research institutes - Private companies (Local oil mills, producers of bottled olive oil) - Farmers' groups (Cooperatives, mutual companies, etc.) < not limited > 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining and CRDA take the initiative to organize committee composed of companies and organizations related to olive oil production. - The conference composed of private companies, farmers, UTICA, URAP, etc. will be operated to coordinate opinions and requests from the members, to conduct collective activities for quality improvement and group purchase of materials, etc. - Ministry of Industry, Energy and Mining and CRDA introduce private companies' good practices of oil mills producing second pressing olive oil. - Ministry of Industry, Energy and Mining in cooperation with other relevant organizations evaluates and reviews the status of the implementation of the actions. The result of the review will be taken into account in making the next phase of development strategies, plans and action plans. 	
Indicator		Risk	
<ul style="list-style-type: none"> - More than 50% of agricultural cooperatives will implement group purchase of materials and equipment by 2025. - The conference composed of existing or newly established oil bottlers, olive farmers, and oil press factories will be established and operated in each Governorate by 2025. - Production of second-pressed olive oil made from pomace will be expanded to more than 50% of oil mills by 2025. 		<ul style="list-style-type: none"> - Not identified 	

Strategy	AG-2	Increasing value added of olive oil by brand establishment and quality improvement		
Plan	AG-2-4	Capacity building of farmers and farmers' groups		
Intervention Area	Medenine, Gafsa, Gabes, Tataouine	Implementing agency	CRDA	
Description				
<p>Though the organization of olive farmers has been relatively functioning compared to other producers, there is much room for reinforcement of organizational roles and activities to make more rigid and resilient base for olive production. Especially in terms of human resource development of young farmers for the future, institutional and organizational structure and program for training and technological succession from experienced farmers to young farmers must be developed in the Southern Region.</p>				
Action Plan				
Actions <Recommended unit>		Relevant organizations		Role
<ul style="list-style-type: none"> - AG-2-4-1: Implementing vocational training on new cultivation technology for young farmers and candidates <Governorate> - AG-2-4-2: Implementing training to promote and manage farmers groups of selected farmers <Governorate> 		<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - CRDA - AVFA - CFPA - URAP - Local research institutes - Farmers' groups (Cooperatives, mutual companies, etc.) - International donors < not limited > 		<ul style="list-style-type: none"> - AVFA and CFPA under CRDA in cooperation with URAP with technical support by international donors give training to young farmers, candidates, and farmers groups on operation and maintenance of the new technology and equipment. - In relation to capacity development of farmers and farmers' groups, capacity development of public bodies (CRDA, AVFA, CFPA, etc.) and local research institutes (IRA, Olive oil institute, etc.) are also implemented by the initiative of the Ministry of Agriculture, Water Resources and Fisheries, and international donors in order to enhance public-private partnership in agriculture sector as a whole.
Indicator			Risk	
<ul style="list-style-type: none"> - Training courses regarding new agricultural technology will be established and implemented in all six Governorates. 			<ul style="list-style-type: none"> - Massive young generation of farmers change their occupation apart from agriculture 	

Sector	Strategy	AG-3	Increasing value added of livestock breeding/aquaculture products by maximizing added value productivity of animal feed, quality improvement, and promotion of collective activities		
	Plan	Actions <Recommended unit>		Term	Cost
Agriculture, livestock breeding, fishery and food processing	AG-3-1: Increasing productivity of animal feed	<ul style="list-style-type: none"> - AG-3-1-1: Study on the compound feed made of local organic substances including proportion of variable and adequate ingredients by development stage - AG-3-1-2: Promotion of the production of forage crops by local farmers (e.g., alfalfa, barley, sorghum, etc.) - AG-3-1-3: Financial support to livestock breeders/aquaculture farmers for equalization of seasonal difference of the cost for animal feed - AG-3-1-4: Establishment of collective procurement system of animal feed via a commercial port in the South <Region> - AG-3-1-5: Evaluation and review of the implemented actions for increasing 		Short - Medium	-
	AG-3-2: Increasing the quality and value of livestock /aquaculture products	<ul style="list-style-type: none"> - AG-3-2-1: Development of processing/storage bases and logistics network for mass processing of livestock /aquaculture products <Governorate> - AG-3-2-2: Quality improvement focusing on each phase of value chain - AG-3-2-3: Development of tracing system to secure traceability of livestock /aquaculture products - AG-3-2-4: Study on local species of livestock/aquaculture products in view of genetic advantage, uniqueness, and high value added - AG-3-2-5: Evaluation and review of the actions implemented for improvement of quality and value of livestock /aquaculture products 		Short- Medium	-
	AG-3-3: Promotion of collective activity and capacity development of livestock breeders/aquaculture farmers	<ul style="list-style-type: none"> - AG-3-3-1: Further promotion of the establishment of breeders' groups <Delegation> - AG-3-3-2: Promotion of collective procurement of feed and materials <Region> - AG-3-3-3: Promotion of collective sales activity <Governorate> - AG-3-3-4: Introduction of new technology, equipment and system including operational training for livestock breeders/aquaculture farmers <Governorate> 		Short	-

Strategy	AG-3	Increasing value added of livestock breeding/aquaculture products by maximizing added value productivity of animal feed, quality improvement, and promotion of collective activities		
Plan	AG-3-1	Increasing productivity of animal feed		
Intervention Area	6 Governorates of the Southern Region	Implementing agency	OEP	
Description				
Expensive animal feed is one of the most serious financial burdens for most of livestock breeders in the Southern Region, and it is often affected by the fluctuation of international market price and climate which are very hard to forecast. To tackle these constraints, local resource such as organic substances and available farmland should be valorized for making compound feed corresponding to various needs of livestock breeders, and for producing forage crops in the region. In addition to the necessary financial support to livestock breeders in the short-term, large amount of animal feed procurement through commercial port in or closer to the Southern Region should be realized in the long-term to decrease transport cost and to take advantage of the economies of scale.				
Action Plan				
Actions <Recommended unit>		Relevant organizations	Role	
- AG-3-1-1: Study on the compound feed made of local organic substances including proportion of variable and adequate ingredients by development stage		<ul style="list-style-type: none"> - OEP - Ministry of Transport - CRDA - URAP - APIA - GDA - Local research institutes - Farmers' groups (Cooperatives, mutual companies, etc.) < not limited > 	- IRA and relevant organizations including OEP conduct study on animal feed made of local organic substance and suitable for specific promising livestock such as broiler by the stage of development. As for animal feed for sheep and goat which OEP has already examined, OEP promotes further diffusion among livestock breeders through the network of farmers' groups and URAP.	
- AG-3-1-2: Promotion of the production of forage crops by local farmers (e.g., alfalfa, barley, sorghum, etc.)			<ul style="list-style-type: none"> - OEP and CRDA take the initiative to promote the production of forage crops (e.g., alfalfa, barley, sorghum, etc.) by local farmers to decrease the dependence on imported and transported animal feed of high cost. - APIA gives necessary financial support to farmers who produce the forage crops. 	
- AG-3-1-3: Financial support to livestock breeders/aquaculture farmers for equalization of the cost for animal feed			- CRDA and APIA give financial and /or physical support to breeders in accordance with the fluctuation of market price of animal feed	
- AG-3-1-4: Establishment of collective procurement system of animal feed via a commercial port in the South <Region>			- Farmers' groups under financial support by CRDA arrange collective procurement of animal feed in a large amount via commercial port developed or expanded by Ministry of Transport.	
- AG-3-1-5: Evaluation and review of the implemented actions for increasing productivity of animal feed			- OEP in cooperation with other relevant organizations evaluates and reviews the status of the implementation of the actions. The result of the review will be taken into account in making the next phase of development strategies, plans and action plans.	
Indicator			Risk	
<ul style="list-style-type: none"> - The percentage of compound feed made of local organic substances and corresponding to development stages of livestock will increase up to 10% of all animal feed consumption by 2025. - Commercial port through which animal feed can be imported will be developed. 			<ul style="list-style-type: none"> - Unexpected fluctuation of international market price of animal feed can strongly affect the productivity of animal feed 	

Strategy	AG-3	Increasing value added of livestock breeding/aquaculture products by maximizing added value productivity of animal feed, quality improvement, and promotion of collective activities		
Plan	AG-3-2	Increasing the quality and value of livestock /aquaculture products		
Intervention Area	6 Governorates of the Southern Region	Implementing agency	CRDA, OEP	
Description				
<p>One of the promising actions to achieve higher value is to develop processing/storage bases and logistics network for mass processing of livestock/aquaculture products to have a merit of economic scale, and another is to develop collective quality management system including tracing system to secure traceability of livestock/aquaculture products. Local research institutes have already accumulated the results of researches on the possibility of the commercialization of local products taking advantage of the uniqueness of local species of livestock/aquaculture products.</p>				
Action Plan				
Actions <Recommended unit>		Relevant organizations	Role	
<ul style="list-style-type: none"> - AG-3-2-1: Development of processing/storage bases and logistics network for mass processing of livestock /aquaculture products <Governorate> 		<ul style="list-style-type: none"> - CRDA - OEP - APIA - Financial institutions (BNA, BFPME, etc.) - Local research institutes - Private companies - Breeders' groups (Cooperatives, mutual companies, etc.) < not limited > 	<ul style="list-style-type: none"> - CRDA in cooperation with OEP promotes the development of processing/storage bases and logistics network for mass processing of livestock /aquaculture products. - Breeders, Breeders' groups, and private companies will be the players to operate processing/storage bases and logistics network. - APIA and financial institutions give breeders financial support for development of the bases and network. 	
<ul style="list-style-type: none"> - AG-3-2-2: Quality improvement focusing on each phase of value chain - AG-3-2-3: Development of tracing system to secure traceability of livestock /aquaculture products 			<ul style="list-style-type: none"> - Breeders and private companies under the coordination of CRDA conduct collective activities for quality improvement in the phase of production, processing, transport, storage, sales, and export. - Under the supervision of CRDA, breeders and private companies develop tracing system of the products corresponding to ISO 22005: 2007, "Traceability in the feed and food chain". - APIA and financial institutions give financial support to farmers and private companies for the procurement of equipment needed to operate tracing system. 	
<ul style="list-style-type: none"> - AG-3-2-4: Study on local species of livestock/aquaculture products in view of genetic advantage, uniqueness, and high value added 			<ul style="list-style-type: none"> - IRA and relevant organizations including OEP study local species of livestock/aquaculture products in view of increasing value added such as unique function and specific nutrition of the products. 	

<ul style="list-style-type: none"> - AG-3-2-5: Evaluation and review of the actions implemented for improvement of quality and value of livestock /aquaculture products 	-	<ul style="list-style-type: none"> - CRDA and OEP in cooperation with other relevant organizations evaluate and review the status of the implementation of the actions. The result of the review will be taken into account in making the next phase of development strategies, plans and action plans.
Indicator	Risk	
<ul style="list-style-type: none"> - The processing/storage bases under recommended quality control and logistics system will be developed in each Governorate by 2025. - More than five good practices of the commercialization of new products will be realized in each governorate by 2025. 	<ul style="list-style-type: none"> - Livestock breeding in the Southern Region tends to be the second source of income for farmers whose priority is other products such as olive and dates. To steadily operate the processing/storage bases, sufficient volume of livestock production around the bases must be secured. 	

Strategy	AG-3	Increasing value added of livestock breeding/aquaculture products by maximizing added value productivity of animal feed, quality improvement, and promotion of collective activities		
Plan	AG-3-3	Promotion of collective activity and capacity development of livestock breeders/aquaculture farmers		
Intervention Area	6 Governorates of the Southern Region	Implementing agency	CRDA, OEP	
Description				
<p>There is much room for the activation of breeders' groups in view of the organization, collective activities, and capacity development since most of activities are done by individual breeders in relatively small scale. Organizing larger number of breeders' groups, promoting collective activities for cost reduction, and group sales activity with high negotiating power should be implemented. In addition, it is also effective to introduce new technology, equipment and system including operational training for breeders' groups.</p>				
Action Plan				
Actions <Recommended unit>		Relevant organizations		Role
<ul style="list-style-type: none"> - AG-3-3-1: Further promotion of the establishment of breeders' groups <Delegation> - AG-3-3-2: Promotion of collective procurement of feed and materials <Region> - AG-3-3-3: Promotion of collective sales activity <Governorate> 		<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - CRDA - OEP - AVFA - URAP - APIA - Financial institutions (BNA, BFPME, etc.) 		<ul style="list-style-type: none"> - CRDA takes the initiative to promote the organization of breeders' groups to conduct collective activities of livestock breeders/aquaculture farmers. - Existing and newly established breeders' groups promote collective activities for production such as joint use of equipment, collective procurement of feed and materials, and sales such as price negotiation with brokers.
<ul style="list-style-type: none"> - AG-3-3-4: Introduction of new technology, equipment and system including operational training for livestock breeders/aquaculture farmers <Governorate> 		<ul style="list-style-type: none"> - Breeders' groups (Cooperatives, mutual companies, etc.) - Local research institutes - International donors < not limited > 		
Indicator		Risk		
<ul style="list-style-type: none"> - More than three breeders' groups for collective procurement and sales will be established in each Governorate by 2025. - More than 50% of breeders will install new technology, equipment and system by 2025. 		<ul style="list-style-type: none"> - Not identified 		

Sector	Strategy	AG-4	Promotion of other promising products, technology, and organizations for efficient and sustainable agriculture		
	Plan		Actions <Recommended unit>	Term	Cost
Agriculture, livestock breeding, fishery and food processing	AG-4-1: Introduction and promotion of promising products		<ul style="list-style-type: none"> - AG-4-1-1: Introduction and promotion of promising agricultural products (e.g., medicinal and aromatic plants, vegetables made by geothermal greenhouse, etc.) - AG-4-1-2: Further promotion of promising livestock breeding products (e.g., rabbit, quail, bee, and other rare local species, etc.) - AG-4-1-3: Introduction and promotion of promising aquaculture products (e.g., tilapia, tuna, shrimp, and other rare local species, etc.) - AG-4-1-4: Further research and development for commercialization of promising local species 	Short - Medium	-
	AG-4-2: Introduction and promotion of innovative agricultural technology		<ul style="list-style-type: none"> - AG-4-2-1: Further diffusion of decentralized water desalination system with PV panel - AG-4-2-2: Renewal and re-evaluation of existing agricultural equipment, materials, and systems (e.g., energy-saving water pump, traditional irrigation system “<i>Jessours</i>”) - AG-4-2-3: Diffusion of innovative water-saving materials and agricultural methods (e.g., polymer gel for soil, film farming system, etc.) 	Short-Medium	-
	AG-4-3: Promotion of the establishment and enhancement of farmers' groups (cooperatives, mutual companies, professional groups, etc.)		<ul style="list-style-type: none"> - AG-4-3-1: Dissemination of good practices and advantages of farmers' groups <Governorate> - AG-4-3-2: Reinforcement of the function of existing GDAs <Delegation> - AG-4-3-3: Further promotion of the establishment of agricultural material shops for collective and efficient procurement <Region/Governorate> - AG-4-3-4: Promotion of collective production and sales by farmers' groups <Delegation> - AG-4-3-5: Establishment of professional farmers' groups by product for capacity development of farmers and other farmers' groups <Governorate> 	Short	-

Strategy	AG-4	Promotion of other promising products, technology, and organizations for efficient and sustainable agriculture		
Plan	AG-4-1	Introduction and promotion of promising products		
Intervention Area	6 Governorates in the Southern Region	Implementing agency	CRDA	
Description				
<p>In addition to dates (AG-1), olive oil (AG-2), and livestock/aquaculture products (AG-3), there are some other promising products which are not produced or less commercialized in the Southern Region. Promising agricultural products such as medicinal and aromatic plants, arboriculture products which is distinctive in each governorate, and vegetables made in geothermal greenhouse, etc. should be promoted taking into account not only economic value but also the harmonization with local flora regarding the introduction of new species. In addition, research and development related to livestock products such as rabbit, quail, and bee, etc. aquaculture products such as tilapia, tuna, and shrimp, etc. should also be implemented.</p>				
Action Plan				
Actions <Recommended unit>	Relevant organizations	Role		
<ul style="list-style-type: none"> - AG-4-1-1: Introduction and promotion of promising agricultural products (e.g., medicinal and aromatic plants, vegetables made by geothermal greenhouse, etc.) 	<ul style="list-style-type: none"> - CRDA - Ministry of Environment - AVFA - OEP - URAP - APIA - Financial institutions (BNA, BFPME, etc.) - GI Fruits - GI Peche - Local research institutes (IRA, Technical Centre for Protected Crops and Geothermal of Gabes (CTCPG), etc.) - Farmers' groups (Cooperatives, mutual companies, etc.) 	<ul style="list-style-type: none"> - CRDA and AVFA in cooperation with URAP introduce minor but promising products such as moringa, spirulina, medicinal and aromatic plants, and off-season greenhouse vegetables, etc. to farmers considering not only economic value but also the harmonization with local flora and the risk of alien species so as not to disturb the local biodiversity which contributes to the prevention of desertification, feeding livestock, and giving medicinal features, etc. - In the view of the shift from using non-rechargeable deep aquifer to rechargeable shallow aquifer source, CRDA introduces vegetable species that can be grown on high salinity soils and with high salinity water under technical advice of local research institutes such as IRA. - CRDA and local research institutes develop a GIS platform which covers the distribution of existing and introduced species in the continuity of the work done under Agropastoral Development and Promotion of Local Initiatives for the Southeast (PRODESUD) by IFAD. - APIA and financial institutions give financial support to farmers for cultivation of promising products and development of infrastructure such as greenhouse and irrigation system. - GI Fruits gives necessary technical advice to farmers. 		
<ul style="list-style-type: none"> - AG-4-1-2: Further promotion of promising livestock breeding products (e.g., rabbit, quail, bee, and other rare local species, etc.) 	<ul style="list-style-type: none"> - International donors < not limited > 	<ul style="list-style-type: none"> - CRDA, AVFA, and OEP in cooperation with URAP further promote minor but promising livestock breeding products such as rabbit, quail, bee, and other rare species. - APIA and financial institutions give financial support for breeding promising products and procurement of animal feed and equipment. - OEP gives necessary technical advice to livestock breeders. 		

<p>- AG-4-1-3: Introduction and promotion of promising aquaculture products (e.g., tilapia, tuna, shrimp, and other rare local species, etc.)</p>	<p>-</p>	<ul style="list-style-type: none"> - CRDA and AVFA in cooperation with URAP introduce minor but promising aquaculture products such as tilapia, tuna, shrimp, and other rare species with careful consideration of project sites so as not to disturb the environment of Ramsar sites. - Ministry of Environment gives technical advice to aquaculture operators who are interested in introducing more sustainable models of production such as Integrated Multi-trophic Aquaculture (IMTA). In the vicinity of especially vulnerable natural sites like Ramsar sites, financial incentive might also be provided to foster the introduction of this type of sustainable aquaculture. - APIA and financial institutions give financial support for cultivation of promising products. - GI Peche gives necessary technical advice to aquaculture operators.
<p>- AG-4-1-4: Further research and development for commercialization of promising local species</p>	<p>-</p>	<ul style="list-style-type: none"> - IRA in cooperation with international donors and farmers' groups conducts further research and development on promising local species focusing on nutritional value and functionality which contribute to add higher value.
Indicator		Risk
<p>- More than five pilot projects of the production of agricultural/livestock/marine products and promising local species will be implemented in each Governorate by 2025.</p>	<p>-</p>	<ul style="list-style-type: none"> - In the introduction of new species, risk of disturbing the local flora by alien species must be carefully considered. - Considering the limitation of water resource, availability of hot spring water for greenhouse agriculture must be properly monitored and regulated by CRDA and local GDAs.

Strategy	AG-4	Promotion of other promising products, technology, and organizations for efficient and sustainable agriculture		
Plan	AG-4-2	Introduction and promotion of innovative agricultural technology		
Intervention Area	6 Governorates in the Southern Region	Implementing agency	CRDA	
Description				
<p>Innovative agricultural technology and equipment need to be diffused to tackle constraints in the Southern Region such as water scarcity and low energy efficiency. It means not only the introduction of modernized technology but also re-evaluation of traditional but eco-friendly and efficient technology such as <i>Jessours</i> for irrigation.</p>				
Action Plan				
Actions <Recommended unit>	Relevant organizations	Role		
<ul style="list-style-type: none"> - AG-4-2-1: Further diffusion of decentralized water desalination system with PV panel 	<ul style="list-style-type: none"> - AVFA - CFPA - URAP - APIA - Financial institutions (BNA, BFPME, etc.) - GDA - Farmers'/fishermen's groups (Cooperatives, mutual companies, etc.) 	<ul style="list-style-type: none"> - CRDA and AVFA take the initiative for further diffusion of decentralized water desalination system with PV panel in addition to the existing systems installed by other donors. Considering the limited volume of desalinated water by the system, target products have to be limited to vegetables whose farmland tends to be small. - CRDA and local GDA supervise the amount of desalinated water by the system and limit the water source to shallow aquifer in which water can be naturally recharged. 		
<ul style="list-style-type: none"> - AG-4-2-2: Renewal and re-evaluation of existing agricultural equipment, materials, and systems (e.g., energy-saving water pump, traditional irrigation system "<i>Jessours</i>") 	<ul style="list-style-type: none"> - Local research institutes - International donors < not limited > 	<ul style="list-style-type: none"> - CRDA and local GDA check the quality and efficiency of existing equipment installed in each farm such as tiller, electric water pump, and irrigation system, and select the equipment to be renewed in terms of quality, efficiency, and sustainability. It includes re-evaluation of traditional irrigation system (<i>Jessours</i>) to be recommended if suitable to the farm. - CRDA in cooperation with URAP and local fishermen's groups promotes the shift from conventional fishing method to sustainable fishing model at the scale of the Southern Region taking into account the result of technical cooperation project by JICA COGEPECT (e.g., further diffusion of artificial reefs). - APIA and financial institutions give financial support to farmers for installing modern technology and equipment to replace the old and existing one. - AVFA and CFPA in cooperation with URAP give training to farmers on operation and maintenance of the new technology and equipment. 		

<p>- AG-4-2-3: Diffusion of innovative water-saving materials and agricultural methods (e.g., polymer gel for soil, film farming system, etc.)</p>	<p>-</p>	<p>- AVFA in cooperation with URAP disseminates agricultural equipment and materials under technical support by international donors especially for water saving such as polymer gel which can retain water in soil and suitable for olive field, and film farming system which can save water and energy compared to existing water-saving irrigation system for greenhouse agriculture.</p> <p>- APIA and financial institutions give financial support to farmers for employing water-saving materials and equipment.</p> <p>- AVFA and CFPA in cooperation with URAP under technical support by international donors train farmers on operation and maintenance of the new technology and equipment.</p>
Indicator		Risk
<p>- Diffusion seminar on the installation of recommended agricultural technology will be held in more than 80% of agricultural cooperatives and GDAs by 2025.</p> <p>- Legal structure for providing financial support to farmers who install recommended agricultural technology will be developed by 2025.</p>	<p>- Not identified</p>	

Strategy	AG-4	Promotion of other promising products, technology, and organizations for efficient and sustainable agriculture	
Plan	AG-4-3	Promotion of the establishment and enhancement of farmers' groups (cooperatives, mutual companies, professional groups, etc.)	
Intervention Area	6 Governorates in the Southern Region	Implementing agency	CRDA
Description			
<p>The bases for the implementation of any activities proposed in the strategies and plans are human resources in the Region such as farmers and experts of relevant public and private organizations, local researchers, etc. This plan aims to promote the establishment of and enhancement of farmers' groups such as cooperatives, mutual companies, and professional groups by product, and capacity development of these organizations to enhance public-private partnership in agriculture sector as a whole.</p>			
Action Plan			
Actions <Recommended unit>	Relevant organizations	Role	
<ul style="list-style-type: none"> - AG-4-3-1: Dissemination of good practices and advantages of farmers' groups <Governorate> - AG-4-3-2: Reinforcement of the function of existing GDAs <Delegation> 	<ul style="list-style-type: none"> - Ministry of Agriculture, Water Resources and Fisheries - CRDA - URAP - APIA - Financial institutions (BNA, BFPME, etc.) 	<ul style="list-style-type: none"> - CRDA introduces good practices and advantages of agricultural cooperatives and mutual companies to farmers who do not join the groups through the network of existing organizations such as URAP and GDAs. For the promotion of establishing mutual companies, changing the organizational structure of existing cooperatives, URAP members, and GDA members to mutual companies is one of the keys for organization. 	
<ul style="list-style-type: none"> - AG-4-3-3: Further promotion of the establishment of agricultural material shops for collective and efficient procurement <Region/Governorate> 	<ul style="list-style-type: none"> - GDA - Farmers' groups (Cooperatives, mutual companies, professional groups, etc.) - Local research institutes 	<ul style="list-style-type: none"> - CRDA promotes the establishment of agricultural material shops managed by farmers' groups in each delegation, and promotes collective procurement of agricultural materials by farmers through the network of existing organizations such as URAP and GDAs. - APIA and financial institutions give farmers' groups financial support for the establishment and operation of agricultural material shops. 	
<ul style="list-style-type: none"> - AG-4-3-4: Promotion of collective production and sales by farmers' groups <Delegation> - AG-4-3-5: Establishment of professional farmers' groups by product for capacity development of farmers and other farmers' groups <Governorate> 	<ul style="list-style-type: none"> - International donors < not limited > 	<ul style="list-style-type: none"> - Existing and newly established farmers' groups promote collective activities for production such as joint use of agricultural equipment and for sales such as price negotiation with brokers. - In relation to the promotion of collective activities, professional farmers' groups by product are established for further improvement of professional skill, knowledge sharing, etc. - Necessary capacity development of public bodies (CRDA, AVFA, CFPA, etc.) and local research institutes are also implemented by the initiative of the Ministry of Agriculture, Water Resources and Fisheries, and international donors in order to enhance public-private partnership in agriculture sector as a whole. 	
Indicator		Risk	
<ul style="list-style-type: none"> - More than 80% of farmers' groups will play multiple roles in various activities such as group procurement, group production, and group logistics by 2025. 		<ul style="list-style-type: none"> - Not identified 	

Sector	Strategy	AG-5	Establishment of bases for food processing and circulating use of local organic substances		
	Plan		Actions <Recommended unit>	Term	Cost
Agriculture, livestock breeding, fishery and food processing	AG-5-1: Activation of existing industrial zone		<ul style="list-style-type: none"> - AG-5-1-1: Rehabilitation of infrastructure in and around the existing industrial zone <Governorate> - AG-5-1-2: Promotion of the attraction of food processing factories related to major agricultural products produced around the industrial zone <Governorate> - AG-5-1-3: Promotion of the attraction of supporting industries <Region> - AG-5-1-4: Evaluation and review of the implemented actions for activation of existing industrial zone 	Short–Medium	-
	AG-5-2: Reinforcement of the linkage among local farmers, food processing factories and supporting industries		<ul style="list-style-type: none"> - AG-5-2-1: Organizing and running of the conference of interest parties related to the bases <Governorate> - AG-5-2-2: Examination of development plan contributing to the reinforcement of linkage among local farmers, food processing factories and supporting industries in and around each industrial zone <Governorate> 	Short–Medium	-
	AG-5-3: Promotion of circulating use of local organic substances in and around the bases		<ul style="list-style-type: none"> - AG-5-3-1: Establishment of compost station, organic waste collection network, and organic fertilizer distribution network <Delegation> - AG-5-3-2: Establishment of rendering station for further reuse of organic waste as animal feed (e.g., olive pomace, irregular dates, and residue of meat/fish processing factory, etc.) <Governorate> - AG-5-3-3: Further promotion of utilization of local organic substances and sub-products (e.g., leaves, branches, and seeds of olive and dates, seaweeds, etc.) - AG-5-3-4: Study on fertilizer made from poultry and cow manure for the production of quality dates and olive - AG-5-3-5: Evaluation and review of the actions implemented for promotion of circulating use of local organic substances 	Short–Medium	Compost station: 100,000DT /1 base

Strategy	AG-5	Establishment of bases for food processing and circulating use of local organic substances	
Plan	AG-5-1	Activation of existing industrial zone	
Intervention Area	6 Governorates in the Southern Region	Implementing agency	Ministry of Industry, Energy and Mining, Ministry of Equipment
Description			
<p>Food processing is one of the effective methods to increase the value added to raw agricultural products, as already proposed in AG-1 for dates, AG-2 for olive, and AG-3 for livestock/aquaculture products. In addition, by forming an industrial cluster of food processing, factories can enjoy the merit of proximity to supporting industries and logistic bases, and effective use of infrastructure. There are open spaces in industrial zones of the Southern Region reserved for the development of food processing factories. But before the attraction of food processing companies and supporting industries, necessary rehabilitation of existing industrial zone should be implemented such as the development of power and water supply, and sewerage system, etc.</p>			
Action Plan			
Actions <Recommended unit>	Relevant organizations		Role
<ul style="list-style-type: none"> - AG-5-1-1: Rehabilitation of infrastructure in and around the existing industrial zone <Governorate> 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining - Ministry of Equipment - Regional development taskforce - ODS - APII 		<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining and Ministry of Equipment take the initiative to examine and propose existing industrial zones suitable for new food-processing industrial cluster, and develop or renew necessary infrastructure such as water supply and sewage under the support of international donors available.
<ul style="list-style-type: none"> - AG-5-1-2: Promotion of the attraction of food processing factories related to major agricultural products produced around the industrial zone <Governorate> 	<ul style="list-style-type: none"> - Financial institutions (BNA, BFPME, etc.) - Private companies for food processing - Farmers' groups (Cooperatives, mutual companies, etc.) - International donors < not limited > 		<ul style="list-style-type: none"> - ODS promotes investment in the target industrial zones considering the requests from local private companies and farmers' groups related to food processing. Proposed target products include, but not limited to, olive oil (Medenine), dates (Kebili and Tozeur), red meat and raw materials for handicraft (Tataouine), dairy products (Medenine, Gabes, and Gafsa), broiler (Medenine), and aquaculture (Medenine). Appropriate scale and distribution of processing factory depending on products must be considered. - APII and financial institutions give financial support to the local companies establishing facilities in the target industrial zones.
<ul style="list-style-type: none"> - AG-5-1-3: Promotion of the attraction of supporting industries <Region> 			<ul style="list-style-type: none"> - ODS promotes investment of supporting industry in the target industrial zones taking advantage of local uniqueness of the products and proximity to Libya and Algeria as the future markets.

<p>- AG-5-1-4: Evaluation and review of the implemented actions for activation of existing industrial zones</p>	<p>-</p>	<p>- Ministry of Industry, Energy and Mining in cooperation with other relevant organizations evaluates and reviews the status of the implementation of the actions. The result of the review will be taken into account in making the next phase of development strategies, plans and action plans.</p>
Indicator	Risk	
<p>- Basic infrastructure of the entire target industrial zones for food processing cluster will be sufficiently developed in each Governorate by 2025.</p> <p>- More than two food processing factories will be newly established in each Governorate by 2025.</p>	<p>- In the selection of the target industrial zone, not only current status of the zone but also the possibility of future development of infrastructure around the zone such as the construction of highway and commercial port must be considered.</p> <p>- Economic, social and political situation in Libya as the future market of food processing industry must be considered in investing in the target industrial zones.</p>	

Strategy	AG-5	Establishment of bases for food processing and circulating use of local organic substances	
Plan	AG-5-2	Reinforcement of the linkage among local farmers, food processing factories and supporting industries	
Intervention Area	6 Governorates in the Southern Region	Implementing agency	Ministry of Industry, Energy and Mining, ODS
Description			
<p>For making rigid linkage among local farmers, food processing factories and supporting industries, the committee composed of these interest parties should be organized in each industrial cluster. In addition, for the collaboration among the parties in the long-term, it is needed to make its own development plans and action plans contributing to the reinforcement of linkage among the parties.</p>			
Action Plan			
Actions <Recommended unit>	Relevant organizations	Role	
<ul style="list-style-type: none"> - AG-5-2-1: Organizing and running of the conference of interest parties related to the cluster <Governorate> 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining - ODS - Regional development taskforce - Private companies - Farmers' groups 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining and ODS take the initiative to organize preparatory committee for food processing cluster to formulate a conference composed of companies and organizations related to food processing cluster. - The conference coordinates opinions and requests from stakeholders. 	
<ul style="list-style-type: none"> - AG-5-2-2: Examination of local development plan contributing to the reinforcement of linkage among local farmers, food processing factories and supporting industries in and around each industrial zone <Governorate> 	<ul style="list-style-type: none"> (Cooperatives, mutual companies, etc.) < not limited > 	<ul style="list-style-type: none"> - Regional development taskforce with Ministry of Industry, Energy and Mining and ODS examine and propose local development plan contributing to the reinforcement of linkage among local farmers, food processing factories and supporting industries in and around each industrial zone considering major products and local characteristics of the zone. 	
Indicator		Risk	
<ul style="list-style-type: none"> - Local development plan of each industrial zone and adjacent area of each Governorate will be proposed by 2025. 		<ul style="list-style-type: none"> - Not identified 	

Strategy	AG-5	Establishment of bases for food processing and circulating use of local organic substances		
Plan	AG-5-3	Promotion of circulating use of local organic substances in and around the bases		
Intervention Area	6 Governorates in the Southern Region	Implementing agency	Ministry of Industry, Energy and Mining, CRDA	
Description				
There is much room for further utilization of local organic substances such as organic waste from oasis, olive pomace, and byproduct of food processing as compost and fertilizer in place of chemical products. In addition, to save the cost of agriculture, local organic substances after proper processing can be partly substituted the expensive animal feed which is one of the most serious constraints and burdens for farmers and livestock breeders.				
Action Plan				
Actions <Recommended unit>		Relevant organizations		Role
- AG-5-3-1: Establishment of compost station, organic waste collecting network, and organic fertilizer distribution network <Delegation>		- Ministry of Industry, Energy and Mining - Ministry of Agriculture, Water Resources and Fisheries - CRDA - URAP		- CRDA establishes compost station in each delegation in cooperation with farmers' groups and local NGOs for operation of the station and organic waste collecting service along with enlightenment activities for farmers for better understanding of using organic compost. - Farmers provide organic waste to the station in exchange for fee or some agricultural materials.
- AG-5-3-2: Establishment of rendering station for further reuse of organic waste as animal feed (e.g., olive pomace, irregular dates, and residue of meat/fish processing factory, etc.) <Governorate>		- GDA - Local research institutes - Farmers' groups (Cooperatives, mutual companies, etc.) - Private companies (operator of food processing factories) - Local NGOs - International donors		- Ministry of Industry, Energy and Mining in charge of food processing establishes rendering station for reuse of organic waste in each governorate in cooperation with farmers' groups, private companies, and local NGOs for operation of the station and product distribution service. - Farmers can buy processed animal feed produced in the station at a reasonable price for livestock breeding. - As a countermeasure against offensive odor, the rendering station should be operated with thorough hygiene management and necessary facilities such as a cold room for temporary storage of wastes from meat/fish processing factory
- AG-5-3-3: Further promotion of utilization of local organic substances and sub-products (e.g., leaves, branches, and seeds of olive and dates, seaweeds, etc.)		< not limited >		- CRDA in cooperation with farmers' groups and local research institute further promotes the use sub-products such as leaves, branches, and seeds of olive and dates, seaweeds, and any other organic substance available in the South to add more value and to promote circulating use of organic substances in the Region.

<ul style="list-style-type: none"> - AG-5-3-4: Study on fertilizer made from poultry and cow manure for the production of quality dates and olive 	-	<ul style="list-style-type: none"> - Local research institute such as IRA in cooperation with CRDA and OEP study fertilizers made from local organic substance and suitable for major agricultural products such as olive and dates. - In relation to the study, capacity development of local research institutes is also implemented by the initiative of the Ministry of Agriculture, Water Resources and Fisheries, and international donors.
<ul style="list-style-type: none"> - AG-5-3-5: Evaluation and review of the actions implemented for promotion of circulating use of local organic substances 		<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining in cooperation with other relevant organizations evaluates and reviews the status of the implementation of the actions. The result of the review will be taken into account in making the next phase of development strategies, plans and action plans.
Indicator		Risk
<ul style="list-style-type: none"> - Compost station will be developed and properly operated in each Delegation by 2025. - Rendering station will be developed and properly operated in each Governorate by 2025. 		<ul style="list-style-type: none"> - Future fluctuation of international price of animal feed can highly affect the effectiveness of the plan.

Sector	Strategy	AG-6	Promotion of multifunctional use of oasis and other agricultural and pastoral area			
	Plan		Actions <Recommended unit>	Term	Cost	
Agriculture, livestock breeding, fishery and food processing	AG-6-1: Promotion of multifunctional use of existing oases		<ul style="list-style-type: none"> - AG-6-1-1: Rehabilitation and improvement of irrigation infrastructure of triple-layered oases - AG-6-1-2: Promotion of collective activities to increase productivity of triple-layered oasis farmers <Governorate/Delegation> - AG-6-1-3: Promotion of activities in oases taking advantage of the uniqueness and biodiversity <Governorate> 	Short - Medium	-	
	AG-6-2: Further development and sustainable management of pastureland in combination with livestock breeding, food processing, and handicraft		<ul style="list-style-type: none"> - AG-6-2-1: Enhancement of pastureland development program being implemented by OEP - AG-6-2-2: Promotion of livestock breeding for red meat processing and production of raw materials for handicraft - AG-6-2-3: Establishment of logistic service for integrated activities of pastureland development, livestock breeding, food processing, and handicraft <Governorate> 	Short - Medium	-	

Strategy	AG-6	Promotion of multifunctional use of oasis and other agricultural and pastoral area		
Plan	AG-6-1	Promotion of multifunctional use of existing oases		
Intervention Area	Gabes, Gafsa, Kebili, Tozeur	Implementing agency	CRDA	
Description				
Oases in the Southern Region represented by triple-layered agriculture composed of dates (upper layer), arboriculture (middle), and forage crops and vegetables (lower) must be maintained and activated in a sustainable manner considering its uniqueness and cultural value. Given the above, series of activities are proposed such as rehabilitation and improvement of existing irrigation infrastructure, reinforcement of network and collective activities by farmers who operate triple-layered oases, and promotion of multi-sectoral activities including education, leisure, and tourism.				
Action Plan				
Actions <Recommended unit>	Relevant organizations		Role	
- AG-6-1-1: Rehabilitation and improvement of irrigation infrastructure of triple-layered oases	<ul style="list-style-type: none"> - CRDA - URAP - APIA - Financial institutions (BNA, BFPME, etc.) - GDA - Farmers' groups (Cooperatives, mutual companies, etc.) 		<ul style="list-style-type: none"> - CRDA takes the initiative to renew infrastructure for water supply in triple-layered oasis such as canal, well, and electric pump in an eco-friendly manner considering requests from GDAs. The results of previous development projects by JICA and other international donors should also be taken into account. - APIA and financial institutions give further financial support to farmers for the installation and/or renewal of irrigation infrastructure. 	
- AG-6-1-2: Promotion of collective activities to increase productivity of triple-layered oasis farmers <Governorate/Delegation>	<ul style="list-style-type: none"> - Local NGOs - International donors <p>< not limited ></p>		<ul style="list-style-type: none"> - Farmers and farmers' groups in collaboration with URAP collectively work on quality improvement of the products produced in triple-layered oasis, collecting by-products from the oasis, negotiation with brokers, marketing and export, etc. 	
- AG-6-1-3: Promotion of activities in oases taking advantage of the uniqueness and biodiversity <Governorate>			<ul style="list-style-type: none"> - CRDA in cooperation with local NGOs promotes inter-sectoral activities in oases such as activates of education, leisure, and tourism focusing on uniqueness of the oases and biodiversity which the oases have fostered. 	
Indicator			Risk	
<ul style="list-style-type: none"> - Infrastructure for irrigation will be renewed or rehabilitated in an eco-friendly manner in 80% of oasis in each governorate by 2025. - Network for collective activities among triple-layered oasis farmers will be established by 2025. 			<ul style="list-style-type: none"> - Not identified 	

Strategy	AG-6	Promotion of multifunctional use of oasis and other agricultural and pastoral area	
Plan	AG-6-2	Further development and sustainable management of pasture land in combination with livestock breeding, food processing, and handicraft	
Intervention Area	Tataouine, Kebili, Tozeur, Medenine	Implementing agency	Ministry of Industry, Energy and Mining, OEP
Description			
<p>Further development and sustainable management of pastureland should be promoted in view of prevention of desertification, further promotion of livestock breeding, and production of animal feed which is one of the major financial burden for farmers who have to buy from outside of the Southern Region.</p> <p>In addition, under proper logistic service and network among farmers and private companies, synergy among pasture land development and management, livestock breeding, food processing and handicraft can be achieved especially in remote areas around Sahara desert whose local economy should be more activated.</p>			
Action Plan			
Actions <Recommended unit>		Relevant organizations	Role
<ul style="list-style-type: none"> - AG-6-2-1: Enhancement of pastureland development program being implemented by OEP 		<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining - OEP 	<ul style="list-style-type: none"> - OEP enhances activities of ongoing pastureland development program in view of livestock breeding promotion.
<ul style="list-style-type: none"> - AG-6-2-2: Promotion of livestock breeding for red meat processing and production of raw materials for handicraft - AG-6-2-3: Establishment of logistic service for integrated activities of pastureland development, livestock breeding, food processing, and handicraft <Governorate> 		<ul style="list-style-type: none"> - Ministry of Tourism and Handicraft - ODS - OEP - APII - APIA < not limited > 	<ul style="list-style-type: none"> - Ministry of Industry, Energy and Mining in cooperation with Ministry of Tourism and Handicraft takes the initiative to establish industrial cluster for livestock breeding, food processing, and handicraft considering proximity to pasturelands in the target Governorates. - ODS, APII, and APIA promote to the investment in livestock breeding, food processing, handicraft, and logistic service for integrated activities in and around the industrial cluster.
Indicator			Risk
<ul style="list-style-type: none"> - Area of pastureland covered by the development program will be doubled by 2025. - Production and processing base for red meat and raw material for handicraft will be developed and properly operated in Tataouine by 2025. 			<ul style="list-style-type: none"> - Water availability and usage at the site of the industrial cluster must be carefully monitored and regulated in a sustainable manner.

3.2.2 Mining and other industrial sectors

(1) Summary of the current conditions and major developments

(a) Summary of the current conditions

Table 3.2-8 shows the summary of the current mining and industrial sector conditions. The analysis is decomposed based on the four factors of Porter's diamond model.

Table 3.2-8 Analysis of mining and industrial sectors in the Southern region based on Porter's diamond model

Sector	Factor conditions	Demand conditions	Related and supporting industries	Firm strategy, structure, and rivalry
Chemical	<p><Phosphate> Large phosphate processor (GCT), agglomeration of phosphate-related firms, and highly skilled workers in Gabes. R&D activities in universities and firms. Production of purified phosphoric acid. Waste and air pollution. Phosphate ore reserves in the current pits in Gafsa are expected to be depleted in 20 to 30 years; other reserves are required.</p> <p><Plastic recycling> Recycling firms are operating at under-capacity because waste collectors are few.</p>	<p><Phosphate> Fertilizer demand is likely to increase.</p>	<p><Phosphate> Large reserve of phosphate ore in Gafsa.</p>	<p><Phosphate> Phosphate industry faces keen international competition.</p>
Mining	<p>Various mineral resources can be exploited in the South.</p>	<p>The demand for construction and raw materials is increasing in the short run</p>	<p>Most of the firms in this sector have to import their machinery because there are no local machinery manufacturers.</p>	<p>The number of firms in this sector is small, and there is limited competition among the firms in the sector.</p>
Construction material	<p>Raw materials used for high-end construction materials such as marble stone, limestone, and gypsum. Some processing firms process these materials</p>	<p>High-priced building materials such as decorative natural stone tile is growing in popularity in the Southern region.</p>	<p>Most of the firms in this sector have to import their machinery because there are no local machinery manufacturers.</p>	<p>Most of the producers in this sector do not have many competitors within their business domain</p>
Textile	<p>There are many firms that perform as OEM for foreign brands. The main processing activities are the sowing and cutting stages, which are highly labor-intensive. Limited design and finishing activities.</p>	<p>Limited market for high quality apparel products in the South.</p>	<p>There are no firms producing good quality fabrics in the South.</p>	<p>The major textile firms in the South are subcontractors or partners of European apparel makers.</p>
Electric and electronic	<p>Low production base in this sector. The productive activities of the Yazki plant is highly labor-intensive with limited technology.</p>	<p>There are no big firms requiring large amounts of electric and electronic parts.</p>	<p>There are virtually no supporting industries.</p>	<p>Limited number of firms.</p>

Sector	Factor conditions	Demand conditions	Related and supporting industries	Firm strategy, structure, and rivalry
Solar Energy	<p>The national energy policy pursues the progressive use of renewable energy and establishes benchmarks for the use of solar energy in the renewable energy framework.</p> <p>The Southern region has untapped resources (solar radiation, silica, and potentially qualified human capital).</p>	<p>Demands for solar energy is substantial in accordance with the national energy policies. The energy subsidy cut for the industrial sector will push up operation costs, which is likely to induce the adoption of solar energy.</p> <p>By 2030, the electricity to be supplied by PV and CPV are 2,000 MWh and 600 MWh each. The installation of SWH is to reach 2.5 million square meters.</p> <p>Demands for PV in Tunisia's major trade partner countries (Germany, France, Italy, Spain) show upward trends.</p>	<p>Experimental initiatives in the form of academic-public-private partnerships are limited in number and in scale.</p>	<p>SWH equipment manufacturing is subject to moderate domestic and international competition. The PV market is largely dominated by Chinese and Taiwanese suppliers.</p>

Source: JICA Expert Team

(b) Significant development issues

Several development issues can be identified from the information in Table 3.2-8. First, the chemical sector, which already has an agglomeration of firms and skilled workers, has the potential to increase its competitive edge through the new project plan for purified phosphoric acid. Second, the biggest bottleneck for chemical sector development, however, are environmental concerns caused by waste and pollutants produced in the manufacturing processes. Third, plastic recycling firms face problems concerning the supply of raw materials (plastic waste products), and the solution to this problem would improve the sustainable use of the materials and the environmental landscape. Fourth, there are various natural minerals that can be exploited, but some factors hinder investment in the production of these minerals. Fifth, there is potential to increase the value added of some construction material production by increasing the quality and marketing activities. Sixth, textiles do not have a competitive advantage in this region, yet the development of the sector has substantial job creation effects because it is a highly labor-intensive sector.

With respect to solar energy, Tunisia is still in the incipient stage of industrialization in this field while the supplier markets are dominated by mostly Asian players. However, the national energy target for 2030, which highlights the increasing strategic importance of solar energy implies positive prospects for demands at home and abroad. The energy targets also emphasize abundant available regional resources (land, silica, workforce) that Southern Tunisia can use to pursue industry and service development in this field.

The strategies in the mining and industrial sectors, which are described later in this section, are formulated based on identified development factors.

(2) Strategies and plans

Based on the results from the Porter diamond analysis, the following five strategies are proposed to develop the mining and industrial sectors in the Southern region.

Table 3.2-9 Strategies for mining and other industrial sectors in the Southern region

Sector	Code	Strategy	Effect (direct/indirect)			Indicator
			Value added	Job creation	Sustainability	
Chemical sector	MN-1	Upgrade phosphate processing activities and promote the agglomeration of phosphate-related industries.	Creation of new firms and new products.	Increase in employment for new projects and firms, particularly highly skilled workers.		The number of firms in the sector will be increased by 70 by 2025. The number of employees in the sector will increase by 1,000 by 2025.
Mining, construction materials, and chemicals	MN-2	Promote higher value-added production activities that utilize abundant mineral resources.	Increase in mineral production. Increase in highly valued construction materials and cosmetic products.	Increase in employment in these sectors.		The number of firms in the mining and related industries (such as construction materials and cosmetics) will increase by 30 by 2025. The number of employees in these sectors will increase by 1,200 by 2025.
Chemical and other manufacturing	MN-3	Establish environmentally friendly and sustainable manufacturing activities by develop recycling and decreasing pollutants.	Increase in the production of recycled products.	Increase in employment in the recycling sector.	Decrease in waste and improvements in the local environment. Decrease in the spillage of waste, which benefits the fishing industry in this area. Decrease in pollutant emissions, which improve living conditions.	The amount of waste spillage will be decreased by 20%. The amount of pollutant spillage will decrease by 20%. The ratio of plastics recycling will be increased by 50%.
Textile sector	MN-4	Upgrade the production activities and extend product ranges in the textile industry.	Increase in production and value added in the sector.	Increase in employment in the mining sector.		The number of firms in the textile sector will increase by 30 by 2025. The number of employees in the sector will increase by 1,000 by 2025. More than two textile firms in the South will engage in design and product development activities by 2025.
Renewable energy sector	MN-5	Fostering the manufacturing base and services for the solar energy industry in the south region.	Creation of new firms and technology transfer.	Increase in employment.	Sustainable energy management.	Newly established businesses and employment. Business growth in this field.

Source: JICA Study Team

(a) MN-1: Upgrading of phosphate processing activities and phosphate-related industry agglomeration

(i) Strategy description

GCT is planning a project to produce purified phosphoric acid, which is likely to be realized in a few years. Purified phosphoric acid can be used as a raw material for the manufacturer of many types of fertilizers and food products. This will provide new businesses with the opportunity to produce new products that use purified phosphoric acid and enhance the agglomeration of phosphoric-related industries in this area.

To seize this opportunity and realize the development of this sector, promotion of R&D activity spillover by supporting the spread of relevant technological information to investors and technical personnel is necessary. Promoting linkages among relevant firms and formulating business ideas would also be beneficial.

Aiding investors and entrepreneurs in new investment in these activities will promote production activities and growth. These activities will include the provision of financial and business consultation services to potential investors.

The reserves of phosphate ore in Gafsa are forecasted to be depleted within 20 to 30 years. The exploitation of the phosphate reserves in Tozeur should be encouraged. The exploitation of phosphate reserves in Tozeur should, however, be promoted in socially and environmentally sustainable ways because the pollution and waste concerns of communities are the biggest potential constraints to the chemical sector. Thus, the approval of new exploitation projects should be accompanied by environmental assessments and public participation and should consider social issues such as the employment of local workers.

Moreover, support for the promotion of R&D activities in this sector are important for the continued upgrading of this sector. This includes the promotion of linkages in research activities among university and related firms.

(ii) Direct/indirect effect

The strategy is likely to produce the following effects related to the development goals of the project:

- 1) The creation of new firms and new products.
- 2) An increase in employment from new projects and firms, particularly of highly skilled workers.

(iii) Indicators

To measure the effect of the strategy, the following indicators are proposed:

- 1) The number of firms in the sector will increase by 70 by 2025.
- 2) The number of employees in the sector will increase by 1,000 by 2025.

(iv) Development plan

Short term (2015 to 2020):

< MN-1-1: Promote the establishment of new firms that use purified phosphate acid (GCT plans to implement production in the near future) >

- Identify specific areas for the new production of purified phosphate acid (such as fertilizer, food

additives, paint coating).

- Promote socially and environmentally sustainable investment in the identified areas.
- Develop human resources for specific activities of newly established firms.

Short term to mid-term (2015 to 2025):

< MN-1-2: Promote inter- and intra-sectoral knowledge spillover and linkages to enhance new business opportunities and investment in the applied phosphate acid areas >

- Create a platform for the development of these industries that include stakeholder members of phosphate processing industries.
- Using the platform, enhance the dialogue and cooperation with other industries to promote new areas of phosphate-related products.

< MN-1-3: Enhance R&D and innovation for sustainable sector development >

- Enhance the linkages between research institutes and industry.
- Identify the research areas likely to benefit the phosphate-related industries in the South.
- Obtain funding for research projects

(b) MN-2: Promote higher value-added production activities that utilize abundant mineral resources.

(i) Strategy description




The Southern region features large natural mineral reserves that can be exploited, and these are a significant asset for future development in this region. However, there are also a number of constraints for new investments in the mining industry including the following:.

- Exploitation projects are generally capital-intensive, requiring investors (Tunisian or foreign) with substantial financial capacity.
- These projects use specific technologies that are closely related to the nature, composition, and physico-chemical properties of the material substances. The choice of technology and equipment requires a preliminary phase of studies, analysis, and tests that can take several months and require significant funds.
- The development of these complex projects requires structured organization of the promoter, which means projects are rarely accessible to young or new developers.
- The lack of ports for material export.

The development plans for mining sectors should be formulated to mitigate these constraints. Additionally, the specific development plan should be individually formulated because the factors concerning development differ for each substance. For example, gypsum, limestone, and marble stone can be used as high-end construction materials. Therefore, the comprehensive strategies of the processing stage are desirable for these substances. Salts, clay, and olive oil can be used to produce higher value-added cosmetic products.

For the objective to be realized, development plans to improve the quality of final products, designs, and

promotion in international markets are required.

		
Extracted marble stone	Limestone processing plant (T et T Stone, Kébili)	Cement tile plant (Les Extras Carrelages de Gabès, Gabès)

Various mineral resources can be exploited in the South. Table 3.2-10 lists examples. Scientific study of these substances and analysis of business applications and feasibility are necessary.

Table 3.2-10 Major mineral substances that can be exploited in the Southern region

Substance	Major areas	Potential uses
Feldspathic sands	Southern region	<i>Stoneware, ceramics, earthenware</i>
Silicate	Tataouine	<i>Medical plaster</i>
Cosmetic clay	Tataouine	<i>Thalassotherapy, cosmetic use</i>
Quartz sands	Gafsa	Glassware: flat glass, tableware, bottles, insulating bricks and aerated concrete
Salt	Kebili, Tozeur	Sodium chloride
Clay	Tozeur, Medenine	Brick

Other potential natural resources for development are oil and natural gas. The construction of a gas pipeline from the gas field of Tataouine to the coastal areas of Medenine and Gabes is in the planning stages, as are the construction of a treatment plant and LPG bottling plant in the South. The gas pipeline and plant plans provide significant potential to promote related industries, such as metallics, and create substantial employment

The development of the natural resources should initially include scientific studies of each of the potential natural resources and value chain studies. The exploitation of these natural resources should, however, be promoted in environmentally and socially sustainable ways. The necessary measures for environmental sustainability include the preparation of mapping and inventories of sustainable and non-sustainable resources with estimations of their durability. Based on the mapping and estimations, a regional plan of resource utilization should be established. Additional, environmental assessment should be obligatory for the approval of new exploitation projects.

The measures for social sustainability include the obligation of public participation for the new exploitation project and the establishment of large-scale plants. Additionally, a formula by which each region benefits from a certain proportion of its natural resources for economic and social development should be considered.

In the medium term, the establishment of a new technopole for the promotion and management of natural resource utilization in the South should be realized for large-scale and sustainable development of these sectors. The technopole is expected to comprehensively manage the strategies to promote

natural resources sectors proposed in MN-2.

In the long run, large-scale development of mining and phosphate, marble, and clay processing in Tataouine can be promoted on the condition that the necessary infrastructure, such as railways and ports, are established.

(ii) Direct/indirect effect

The strategy is likely to produce the following effects that are related to the development goals of the project:

- 1) Increased production of natural minerals.
- 2) Increased employment in the mining and manufacturing sectors.

(iii) Indicators

The following indicators are proposed to measure the effect and impact of the strategy:

- 1) The number of mining and industry-related firms (such as construction materials and cosmetics) will increase by 30 by 2025.
- 2) The number of employees in these sectors will increase by 1,200 by 2025.
- 3) The number of firms in the metal and metallic sectors will increase by five by 2025
- 4) The number of employees in the metal and metallic sectors will increase by 100 by 2015.

(iv) Development plan

Short term to Mid-term (2015 to 2025):

< MN-2-1: Conduct comprehensive studies on the potential of the sustainable utilization of mineral resources >

- Conduct scientific studies on potential minerals for which studies have not been conducted.
- Conduct comprehensive analyses of possible processing activities and the value chain of each potential mineral resource.

< MN-2-2: Develop production capacity of natural resource processing industries >

- Develop human resources for mineral resources processing and manufacturing.
- Promote investment in socially and environmentally sustainable sector activities.
- Promote firm linkages in these sectors.
- Promote high value-added construction materials and other potential mineral resource-processed products in domestic and international markets.
- Establish the technopole for the promotion and management of natural resource utilization.

< MN-2-3: Promote the production of salt, clay, and olive oil cosmetics >

- Develop human resources for processing.

- Support small business start-ups.
- Promote Southern region brand cosmetic products to tourists and international markets.

<MN-2-4: Promote gas pipeline and LPG bottling plant-related industries>

- Develop human resources for treatment and LPG bottling plant works.
- Promote metallic industry investment for the construction of pipelines, treatment facilities, LPG plants, and their maintenance services.
- Develop human resources for the metal and metallic sectors.

(c) MN-3: Establish environmentally friendly and sustainable manufacturing activities through recycling efforts and by decreasing pollutants.

(i) Strategy description

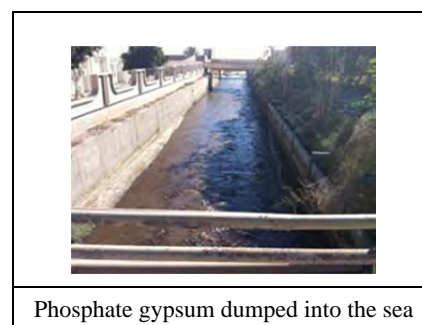
The biggest constraint to the development of chemical and mining sectors in the Southern region is environmental concerns caused by the phosphate production process. For example, phosphate gypsum, a side-product of phosphate acid production, has historically been dumped into the sea causing water pollution. Additionally, SO₂ and mercaptants emissions are polluting the air in the proximity of the chemical firms in Gabes.

Such problems have created tension between the chemical firms and local communities, and technical and financial support to aid firms in the recycling of phosphate gypsum and decreasing air pollutants would be beneficial for the sector's sustainable development. Additionally, many firms in the South do not adopt environmental management systems that reduce waste during production. The promotion of an environmental management system such as ISO14001 should be encouraged.

Limited water resources are a major constraint for industrial development. Water-saving technology should be promoted in the mining, chemical, and manufacturing sectors.

Plastic products and tires are littered in many Southern region locations. This is sometimes the case in tourist areas, and piles of waste degrade the attractiveness of this region as tourist destinations.

Two plastic product recycling firms typically operate at under-capacity. This is because the number of waste collectors are few. This type of job is undesirable because the workers are considered lower class. Public sentiment towards recycling, such as financial and technical support for recycling industries and the establishment of waste recycling systems, will encourage the sustainable use of resources and the improvement of the local environment and landscape. In the long run, glass and rubber recycling plants should be established in the South.



(ii) Direct/indirect effect

The strategy is likely to produce the following effects related to project development goals:

- 1) Recycled product utilization.

- 2) Increased employment for environmental projects.
- 3) Decreased waste and improvements in the local environment and landscape.
- 4) Decreased waste spillage, which benefits the fishing industry in this area.
- 5) Decreased pollutant emissions, which improves living conditions in this area.

(iii) Indicators

To measure the effect and impact of the strategy, the following indicators are proposed:

- 1) The amount of waste spillage will be decreased by 20.
- 2) The amount of pollutant spillage will be decreased by 20.
- 3) The ratio of plastics recycling will be increased by 50.

(iv) Development plan

Short term to Mid-term (2015 to 2025):

< MN-3-1: Establish a recycling system for products such as plastics >

- Establish laws to promote plastics recycling.
- Support of recycling firms.
- Promotion of new equipment and technologies that enables efficient large-scale recycling of plastics.
- Promote public awareness of recycling.

< MN-3-2: Promote environmentally friendly techniques in the chemical and mining sectors >




- Establish monitoring systems to measure air pollutants and waste generated by chemical sector production activities.
- Promote investment in environmentally friendly techniques or equipment.
- Promote the introduction of new technologies to reduce waste.
- Promote the introduction of environmental management systems by firms.
- Promote the introduction of water-saving technologies by firms.

(d) MN-4: Upgrade production activities and extend product ranges in the textile industry.

(i) Strategy description

There is some agglomeration of textile firms in the South. The textile industry holds limited competitive advantages because most firms only engage in cutting and sewing activities (which is highly labor-intensive) and lack high value-added processing activities.

Sustainable development of this sector requires production activity upgrades and the extension of product ranges. More variety in production and processing activities in the textile sector in the South will create new businesses and additional sector development.

		
Clothing manufacturing at DUNTEX, Tozeur	Cutting at Golfe Textile, Gabès	Final products at Golfe Textile, Gabès

(ii) Direct/indirect effect

The strategy is likely to produce the following effects related to the project development goals:

- 1) An increase in sector production and value added.
- 2) An increase in sector employment.

(iii) Indicators

The following indicators are proposed as measures of the effect and impact of the strategy:

- 1) The number of firms in the textile sector will increase by 30 by 2025.
- 2) The number of sector employees will increase by 1,000 by 2025.
- 3) More than two textile firms in the South will engage in design and product development activities by 2025.

(iv) Development plan

Short term to mid-term (2015 to 2025):

< MN-4-1: Promote design and product development activities in the apparel sector >

- Develop the human resources required for design and product development.
- Promote investment in design and product development activities.
- Promote Southern region brand apparel products in international markets.

< MN-4-2: Promote the linkages in the textile sector to enhance new business opportunities and investment >

- Create a study group among the textile firms.
- Establish an information-sharing system for stakeholders.
- Hold matching events.

< MN-4-3: Enhance the productive capacities of the textile sector >

- Promote textile sector investment.
- Develop human capital for the textile industry.
- Improve the productivity of firms by providing production consultations.

(e) MN-5: Foster the manufacturing base and services for the solar (renewable) energy industry in the Southern region.

(i) Strategy description

The fiscal and tax incentives that benefit the end-users and the equipment manufacturing or importing businesses have been initiated, and a series of specific equipment installation programs have been implemented. These efforts have resulted in significant progress in the number of households equipped with SWH systems and an increase in the number of domestic SWH manufacturers and relevant service businesses although the start-ups based in the Southern regions have been disproportionately low. The progress observed concerning the adoption of PVs and CPVs have been lagging behind that of SWH, while the adoption of PV and CPV systems for productive activities (agriculture and industry sectors) and for general electricity and lighting for buildings (schools, government buildings) is expected to increase because of cuts in energy subsidies. Increased electricity tariffs and natural gas prices are raising production/operational costs.

The proposed strategy is in alignment with national energy policies and benchmarks for the year 2030. The strategy aims to foster advancement in these fields by providing support to viable solar energy-related business development and/or expansion of current businesses. Such business development can realize sustainable energy management, technological transfer, additional employment for qualified workers, and energy-efficient production activities, all of which will increase the competitiveness of the Southern region. The plans prioritize two segments of solar energy: (1) SWH and (2) PV/CPV and do not emphasize export-oriented mega electricity generation and distribution projects because the initial priorities are more likely to generate multiplier and sustainable benefits for the region.

(ii) Direct/indirect effect

The expected effects of strategy implementing are the following:

- Productive utilization of locally available natural resources (solar and, possibly, silica).
- Properly trained, locally available human resources.
- Creation of new value-added business and technology transfer.
- Sustainable energy management.

(iii) Indicators

The following indicators are proposed to measure the effects and impacts of the strategy:

- Newly established businesses and increased employment (R&D, manufacturing, services).
- Annual turnover of (sub-) sector businesses.
- Market share of the Southern region-based companies in the domestic market.
- Volume of public and private investments.
- Size and volume of newly installed solar energy systems/equipment.

(iv) Development plan

Short term to mid-term (2016 to 2020):

< MN-5-1: Strengthen the value chain of SWH systems > and < MN-5-2: Build a foundation for

component production and system use of PV and related services >

- Strengthen the regional knowledge base and establish a foundation to foster solar energy use.
- Improve human resources in alliance with research and academic institutions.
- Mobilize resources and invest in demonstrative projects to improve the business environment and infrastructure conducive to innovation.

Mid-term (2021 to 2025):

< MN-5-1: Strengthen the value chain of SWH systems > and < MN-5-2: Build a foundation for component production and system use of PV modules and related services >

- Activate manufacturing and service unit clustering by implementing a holistic plan that links green energy and local industries/businesses/livelihoods.
- Advance private sector-led clustering and synergy creation with a wider array of local economies based on better incubation services and innovation incentives.

(3) Action plans

The action plans are shown in action plan sheets attached to this subsection 3.2.2.

(4) Job creation estimates from strategy implementation

Table 3.2-11 shows the method used to estimate job creation from the overall strategy implementation. The number of jobs to be created from the implementation of MN-1 is based on industry expert and GCT manager discussions that lead the purified phosphoric acid projects.

The number of jobs to be created through the implementation of MN-2 is estimated as the accumulation of jobs from each plan and action plan because each strategy covers multiple products.

The number of new jobs from MN-4 is estimated by the number of target production plants divided by the estimated number of employees per plant.

Job creation from MN-3 is not estimated because the aim of the strategy is not employment creation but environmental sustainability. Additionally, job creation for MN-5 is not estimated because each governorate must set solar energy targets before estimating the scale of employment that will be created.

Table 3.2-11 Job creation estimation method by strategy

Strategy	Estimation method	Remarks
MN-1: Upgrade phosphate processing activities and agglomerate phosphate-related industries.	Discussion with industry experts and GCT managers who lead the purified phosphoric acid projects.	
MN-2: Greater value-added production activities that utilize abundant mineral resources.	Accumulated estimated of jobs created from each plan and action plans.	The number of employees in oil and gas-related sectors is estimated based on current plans.

MN-3: Establish environment-friendly and sustainable manufacturing activities by developing recycling and decreasing pollutants.	Job creation estimates are not calculated because new jobs are the objective.	
MN-4: Production activity upgrades and extended product ranges in the textile industry.	The target number of the increase in production units by 2035 is 60.	The estimated number of employees per production is based on interviews with textile experts in the Southern and Northern areas of Tunisia.
MN-5: Fostering manufacturing base and service for solar (renewable) energy industry	The figure is not estimated because each governorate must decide how much solar energy is generated to estimate the scale of employment that will be created.	-

Source: JET

Some spill-over effects are inherent in the manufacturing and mining sector strategies. These spill-over effects include the upgrading of other construction materials such as bricks and concrete, the development of construction and furniture industries, and the creation of new business in unidentified sectors from R&D promotional activities. Table 3.2-12 shows the expected number of jobs created by these spill-over effects.

Given the above, the expected number of new jobs by 2035 as a result of strategy implementation is estimated to be 14,600 people, as shown in Table 3.2-12. Additionally, indirect employment associated with strategy implementation will be accounted for separately.

Table 3.2-12 Expected number of new jobs (direct employment) by 2035

(Unit: ppl)

Strategy	Medenine	Tataouine	Gabes	Gafsa	Kebili	Tozeur	Total
MN-1	400	-	2,000	800	-	300	3,500
MN-2	900	1,800	800	600	300	250	4,650
MN-3	-	-	-	-	-	-	-
MN-4	600	150	150	800	100	150	1,950
MN-5	-	-	-	-	-	-	-
Spill-over	1,000	500	1,200	1,000	400	400	4,500
Total	2,900	2,450	4,150	3,200	800	1,100	14,600

Sector	Strategy	MN-1	Phosphate processing activity upgrades and the agglomeration of phosphate-related industries	
	Plan		Actions	Term
Mining and manufacturing	MN-1-1: Establish new firms that use purified phosphate acid (which GCT will produce in the near future).		<ul style="list-style-type: none"> - Identify application areas for newly produced purified phosphate acid (such as fertilizer, food additives, paint coating) - Investment in socially and environmentally sustainable production in the identified areas. - Develop human resources for newly established firms. 	Short-medium
	MN-1-2 Inter- and intra-sectoral knowledge spillover and linkages to enhance new business opportunities and investment in the applied areas of phosphate acid.		<ul style="list-style-type: none"> - Member platform creation for stakeholders of the phosphate processing industries. - Dialogue and cooperation with other industries to promote newly applied areas of phosphate-related products through the platform. 	Short-medium
	MN-1-3 R&D and innovation for the sustainable development of this sector.		<ul style="list-style-type: none"> - Enhance the linkages between the research institutes and industry. - Identify research areas likely to benefit the phosphate-related industries in the South. - Obtain funding for research projects 	Short-medium

Strategy	MN-1	Upgrade phosphate processing activities and agglomerate phosphate-related industries.		
Plan	MN-1-1	Promote the establishment of new firms that use purified phosphate acid (GCT will implement production in the near future).		
Intervention area	Gabès, Gafsa, Médenine, Tozeur	Implementing agency	APII	
Description				
GCT's project plan will produce purified phosphoric acid. There are various areas for the potential application of products that utilize purified acid. The potential applied products include the following: <ul style="list-style-type: none"> ● Food additives ● Paint coating ● Extinguishing compositions ● Detergent ● Fertilizer The project aims to promote new product business that will use purified phosphoric acid.				
Action plan				
Actions	Relevant organizations		Role	
<ul style="list-style-type: none"> - Identify new application areas for newly produced purified phosphate acid (such as fertilizer, food additives, paint coating). 	<ul style="list-style-type: none"> - APII - ODS - UTICA - Technopole - GCT - CPG 		<ul style="list-style-type: none"> - APII works with GCT to identify specific areas for potential processing or products that utilize purified phosphoric acid produced by GCT - APII works with GCT and research institutes, such as universities, to determine the technological requirements for production in the applied areas. 	
<ul style="list-style-type: none"> - Investment in socially and environmentally sustainable production of the identified application areas. 	<ul style="list-style-type: none"> - University of Gabes - BFPME - Ministry of Industry - Ministry of Environment < not limited > 		<ul style="list-style-type: none"> - APII includes the products specified as possible investment targets and offers financial incentives for investment in these products - APII distributes technology-related information on the production of these products to investors and other stakeholders. - ODS and BFPME use the technological information to consult with entrepreneurs and SMEs. - The Ministry of Industry and CPG conduct studies on the potential phosphate resources in Tozeur and the prospects of their exploitation, which includes an environmental assessment - The Ministry of Industry and CPG ensures that the approval of phosphate resource exploitation includes public participation and considers social issues such as local employment. 	
<ul style="list-style-type: none"> - Human resources development for newly established firm activities 	<ul style="list-style-type: none"> - Ministry of Vocational Training and Employment - Technical centers 		<ul style="list-style-type: none"> - Ministry of Vocational Training and Employment and technical centers establish professional training schools for firm activities. 	
Indicator				Risk
<ul style="list-style-type: none"> - Obligation to conduct environmental assessment for new mining and processing sector investment by 2020. - A study on the potential phosphate resources in Tozeur and the exploitation prospects to be completed by 2020. - Number of firms in phosphate-related industries to increase by 70 by 2025 - Number of employees in phosphate-related industries to increase by 1,000 by 2025. 				<ul style="list-style-type: none"> - Not identified

Strategy	MN-1	Upgrade phosphate processing activities and agglomerate phosphate-related industries.	
Plan	MN-1-2	Promote inter- and intra- knowledge spillover and linkages to enhance new business opportunities and investment in phosphate acid industries.	
Intervention area	Gabès, Gafsa, Médenine	Implementing agency	APII and UTICA
Description			
<p>Purified phosphoric acid has various potential areas of application indicating the need to align various technologies and identify the producers and users required for industrial development in this area.</p> <p>The project aims to promote the linkages within phosphate-related industries and other industries with the potential to use phosphoric acid. This will stimulate information spillover within and outside the chemical sector to create new business opportunities and investment.</p>			
Action plan			
Actions	Relevant organizations		Role
<ul style="list-style-type: none"> - Create a member platform for phosphate processing industry stakeholders. 	<ul style="list-style-type: none"> - APII - ODS - UTICA - Technopole - GCT - CPG - University of Gabes 		<ul style="list-style-type: none"> - APII and UTICA will create a phosphate producer and stakeholder platform where members exchange information and discuss sector developments. The platform will also summarize the demands of the producers to the government for sector development. - The executive body of the platform will accumulate technical and industrial information.
<ul style="list-style-type: none"> - Dialogue and cooperation with other industries to promote new phosphate-related products through the platform. 	< not limited >		<ul style="list-style-type: none"> - The executive body of the platform disseminates accumulated information to the public as reports and/or on the web. - The executive body of the platform holds the matching events of producers and users or seminars where the firms in other industries participate.
<ul style="list-style-type: none"> - Platform to be established by 2020. - Matching events or seminars to be held by 2025. 			<ul style="list-style-type: none"> - Not identified

Strategy	MN-1	Upgrade phosphate processing activities and agglomerate phosphate-related industries.	
Plan	MN-1-3	Enhance R&D and innovation for sustainable sector development.	
Intervention area	Gabès, Gafsa, Médenine	Implementing agency	APII and Technopole
Description			
New product innovation to identify potential application areas are necessary for long-term industry development. The government can play a major role in financing R&D activities by encouraging collaboration among the research institutes and industries to exploit knowledge spillovers in R&D activities.			
Action plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Enhance the linkages between research institutes and industry. 	<ul style="list-style-type: none"> - APII - ODS - UTICA - Technopole - GCT - CPG - University of Gabès < not limited > 	<ul style="list-style-type: none"> - APII to promote collaborative research among industry and research institutes through financial support and/or facilitation of collaborative research. - APII to promote contract research from industry to research institutes through financial support and/or facilitation. 	
<ul style="list-style-type: none"> - Identify research areas likely to benefit from the phosphate-related industries in the South. 		<ul style="list-style-type: none"> - The executive body of the platform will coordinate with research institutions and industries to identify potential research projects. 	
<ul style="list-style-type: none"> - Obtain funding for research projects 		<ul style="list-style-type: none"> - The executive body of the platform will coordinate with relevant government organizations to obtain funding for research projects. Examples of funding sources include the National Research Council and research funds of various donors such as the EU. 	
Indicator		Risk	
<ul style="list-style-type: none"> - More than five collaborative studies and research contract researches to be completed by 2025. - More than two research projects to be completed by 2025. 		<ul style="list-style-type: none"> - Not identified 	

Sector	Strategy	MN-2	Higher value-added production activities utilizing abundant mineral resources.	
	Plan		Actions	Term
Mining and manufacturing	MN-2-1: Conduct comprehensive studies of sustainable minerals resources use.		<ul style="list-style-type: none"> - Scientific studies of potential sustainable minerals resources use. - Comprehensive analysis of possible processing activities and the value chain of each potential mineral resource. 	Short-medium
	MN-2-2 Develop production capacity of natural resource processing industries.		<ul style="list-style-type: none"> - Human resource development for mineral resource processing and manufacturing. - Sector investment in socially and environmentally sustainable sector activities. - Linkage between sector firms. - Marketing of high value-added construction materials and other potential mineral resource-processed products to domestic and international markets. - Establishment of the technopole for the promotion and management of natural resource utilization. 	Short-medium
	MN-2-3 Production of cosmetic products made from products such as salt, clay, and olive oil.		<ul style="list-style-type: none"> - Human resource development for processing. - Support for business start-ups. - Marketing of Southern region brand cosmetic products to tourists and international markets. 	Short-medium
	MN-2-4 Promotion of gas pipeline and LPG bottling plant industries.		<ul style="list-style-type: none"> - Human resource development for treatment and LPG bottling plants. - Investment in the metallics industry for the construction of pipelines, treatment and LPG plants, and maintenance services. - Human resource development for metal and metallic sectors. 	Short-medium

Strategy	MN-2	Higher value-added production activities utilizing abundant mineral resources.		
Plan	MN-2-1	Conduct scientific studies of the potential applications and the sustainable use of minerals resources.		
Intervention area	Gafsa, Tataouine, Medenine, Gabes, Kebili, Tozeur	Implementing agency	APII	
Description				
<p>Large reserves with various natural minerals are accessible for exploitation in the Southern region but the following constraints apply to new mining investments. The Southern region of Tunisia is abundant with mineral resources but the sale of those resources does not generate significant value added to the region. Therefore, it is important to locate the processing activities of the mineral resources extracted in the South in the same region to increase the value added.</p> <p>A sector-specific development strategy is not sufficient to promote Southern region processing activities. A comprehensive strategy that includes the whole value chain of the specific mineral resource is necessary. This project encompasses a comprehensive development strategy and investment promotion for the mining sector and its related sectors.</p>				
Action plan				
Actions		Relevant organizations	Role	
<ul style="list-style-type: none"> - Comprehensive studies of potential minerals resources and their sustainable use. 		<ul style="list-style-type: none"> - APII - ONM - Ministry of Environment < not limited > 	<ul style="list-style-type: none"> - ONM, in collaboration with the Ministry of Environment, prepare the mapping/inventory of sustainable and non-sustainable resources with durability estimations. - Based on the inventory information, ONM and the Ministry of Environment establish a regional plan for resource utilization. 	
<ul style="list-style-type: none"> - Comprehensive analysis of possible processing activities and the value chain of each potential mineral resource. 			<ul style="list-style-type: none"> - ONM, in collaboration with APII, conduct a feasibility study for the development of potential mineral resources such as white dolomite in Gafsa for ceramic and glass industries, silicate (SiO₂) in Tataouine for medical plaster, salt in Tozeur and Kebili for sodium chloride, and clay in Tozeur, Medenine, Kebili, and Tataouine for brick. - ONM, in collaboration with APII, conduct a value chain analysis that proposes the possible processing areas and new business opportunities using the materials. The potential mineral resources include marble (Tataouine), limestone (Tataouine, Medenine, Gabes, Kebili), and Gypsum (Tataouine). 	
Indicator			Risk	
<ul style="list-style-type: none"> - Mapping/inventory of resources with durability estimations for major natural resources by 2020. - Regional plan of resource utilization by 2020. - Feasibility studies for major potential natural resources by 2020. - Value chain analysis of major potential natural resources by 2020. 			<ul style="list-style-type: none"> - Not identified 	

Strategy	MN-2	Higher value-added production activities utilizing abundant mineral resources.		
Plan	MN-2-2	Develop the production capacity of natural resource processing industries.		
Intervention area	Tataouine, Kebili, Medenine, Gabes, Touzeur, Gafsa	Implementing agency	APII	
Description				
<p>The strategy aims to increase value added by developing natural resource processing activities. For products such as marble, limestone, and gypsum the strategy aims to improve the quality of final products, design, and marketing in the international arena. Cement manufacturing can also be promoted by targeting the domestic markets and that of neighboring countries. The establishment of cement factories is recommended for Tataouine and Kebili where no such firms are currently established.</p> <p>Other natural resource processing products with potential include the following:</p> <ul style="list-style-type: none"> ● White dolomite in Gafsa for the ceramic and glass industries. ● Silicate (SiO₂) in Tataouine for medical plaster. 				
Action plan				
Actions	Relevant organizations		Role	
- Human resources development for mineral resources processing and manufacturing.	<ul style="list-style-type: none"> - Ministry of Vocational Training and Employment - Technical centers 		<ul style="list-style-type: none"> - Ministry of Vocational Training and Employment and technical centers establishes professional training schools for the processing of natural resource-processed products. 	
- Promote investment in socially and environmentally sustainable industry activities.	<ul style="list-style-type: none"> - APII - Technopole - Ministry of Industry - ODS - Ministry of Environment 		<ul style="list-style-type: none"> - Ministry of Industry, in collaboration with the Ministry of the Environment are obliged to conduct an environmental assessment large-scale investment in the mining and processing sectors. - ODS utilizes the environmental assessment and regional plan of resource utilization at the public consultation for new mining investment to mitigate the conflict with communities. - The Ministry of Industry, in collaboration with the Ministry of the Environment, include the rehabilitation of mining sites as one condition for investment in new mining. - APII include the products specified above to the list for investment promotion and provide financial incentives for investments in these products or related activities. - APII disseminate the technology-related information on the production of these products to investors and other stakeholders. - A formula is proposed with which each region will benefit from a certain proportion of its natural resources for its economic and social development. - APII and Technopole prepare a large-scale industrial zone in Tataouine for mining and processing of natural resources such as phosphate, marble, and clay. - APII and Technopole promote large-scale investments in Tataouine for mining and processing of natural resources, which use the new railway to Tataouine. 	
- Linkages between sector firms.	<ul style="list-style-type: none"> - APII - UTICA 		<ul style="list-style-type: none"> - Creation of an industrial association for the mining and natural resource processing sectors. - APII and UTICA hold matching events for 	

	- < not limited >	producers and users or seminars that promote new business opportunities where firms from other industries can participate.
- Promotion of high value-added construction materials and other potential mineral resource-processed products in domestic and international markets.	- APII - CEPEX - UTICA	- The industrial association, with the collaboration of CEPEX, establishes a marketing intelligence unit to promote natural resource-processed products in international markets. - APII collaborates with CEPEX and promotes natural resource-processed products made in the South by participating in exhibitions.
- Establish the technopole for the promotion and management of natural resource utilization.	- Technopole	- Establish the technopole that promotes and manages natural resource utilization. - Technopole comprehensively manages the promotion of the natural resources sector strategies suggested in MN-2.
Indicator		Risk
<ul style="list-style-type: none"> - Training courses established by 2020. - Environmental assessment for new investment for mining and processing sectors by 2020. - Requirement for the rehabilitation of mining sites as a condition for the permission of new mining investment by 2020. - Technopole of natural resources utilization e established by 2025. - Industrial association formed by 2020. - More than five of natural resources processing firms will participate in exhibitions by 2025. - The number of firms in mining and related industries (such as construction materials and cosmetics) will increase by 30 by 2025. - The number of employees in mining and related industries (such as construction materials and cosmetics) will increase by 1,000 by 2025. 		- Not identified

Strategy	MN-2	Higher value-added production activities that utilize abundant mineral resources.		
Plan	MN-2-3	Production of cosmetic products made from products such as salt, clay, and olive oil.		
Intervention area	Tataouine, Gabès, Gafsa	Tozeur, Medenine,	Implementing agency	APII
Description				
Products such as clay, salt, olive oil, and herbs produced in the South can be used for cosmetics production and marketed to tourists and international consumers. Additionally, as cosmetics production, such as that of soap and essential oils, do not typically require sophisticated technology and large-scale investment. Sector development complements the growth of small-scale enterprises and entrepreneurship.				
Action plan				
Actions	Relevant organizations		Role	
– Human resources development for processing.	– Ministry of Vocational Training and Employment – Technical centers		– Ministry of Vocational Training Employment and technical centers establish training courses for cosmetic production processing in the existing Southern region vocational schools.	
– Support of small business start-ups.	– ODS – BFPME		– ODS and BFPME use the output of value chain analysis for consulting with entrepreneurs and SMEs.	
– Marketing of Southern brand cosmetic products to tourists and international consumers.	– APII – CEPEX		– APII works with CEPEX and promotes cosmetic products made in the South by participating in exhibitions. – APII works with Ministry of Tourism to market cosmetic products to tourists using promotion materials (pamphlets and posters) and setting up product exhibitions.	
Indicator			Risk	
– Professional training courses available by 2020. – The number of firms in mining and related industries (such as construction materials and cosmetics) to increase by 30 by 2025 – The number of employees in mining and related industries (such as construction materials and cosmetics) to increase by 1,000 by 2025 – More than five construction materials firms will participate in exhibitions by 2025.			– Not identified	

Strategy	MN-2	Higher value-added production activities utilizing abundant mineral resources.		
Plan	MN-2-4	Promotion of gas pipeline and LPG bottling plant-related industries.		
Intervention area	Tataouine, Medenine, Gabes, Kebili	Implementing agency	APII	
Description				
Gas pipeline construction is planned from the gas field of Tataouine to the coastal areas of Medenine and Gabes. The construction of a treatment plant and LPG bottling plant is also planned in the South. This strategy aims to increase employment and promote gas pipeline and plant-related industries.				
Action plan				
Actions	Relevant organizations		Role	
<ul style="list-style-type: none"> - Human resources development for the oil and gas sector. 	<ul style="list-style-type: none"> - Ministry of Vocational Training and Employment - Ministry of Industry 		<ul style="list-style-type: none"> - Ministry of Vocational Training and Employment establishes professional training courses for gas and oil treatment works. - Ministry of Vocational Training and Employment establishes vocational training courses for the treatment and LPG plant works. - The industry ministry requires oil and natural gas companies to employ youth from local communities. 	
<ul style="list-style-type: none"> - Promote investment in the metallic sectors for the construction of pipeline, treatment and LPG plants, and their maintenance services. 	<ul style="list-style-type: none"> - APII - Ministry of Vocational Training and Employment 		<ul style="list-style-type: none"> - APII includes metallic sector into the investment promotion list and provides financial incentives for metallic sector investment in Tataouine. - Ministry of Vocational Training and Employment establishes professional training courses for metal processing. 	
Indicator			Risk	
<ul style="list-style-type: none"> - Professional training courses available by 2020. - The number of firms in metal and metallic sectors to increase by 5 by 2025. - The number of employees in metal and metallic sectors will increase by 100 by 2015. 			<ul style="list-style-type: none"> - Not identified. 	

Sector	Strategy	MN-3	Establish sustainable manufacturing activities by developing recycling and environmentally friendly techniques.	
	Plan		Actions	Term
Mining and manufacturing	MN-3-1: Establish a plastics recycling system.		<ul style="list-style-type: none"> - Establish laws to promote plastics recycling. - Support to recycling firms. - Promote new equipment and technologies for the efficient large-scale plastics recycling. - Increase public awareness of the need to recycle. 	Short-medium
	MN-3-2 Promote environmentally friendly techniques in the chemical and mining sectors.		<ul style="list-style-type: none"> - Establish a monitoring system to measure the air pollutants and waste generated by chemical and mining sector activities. - Promote investment in environmentally friendly techniques and equipment. - Promote new technologies to reduce waste. - Promote environmental management system firms. - Promote water-saving technology firms. 	Short-medium

Strategy	MN-3	Establish sustainable manufacturing activities by developing recycling and promoting environmentally friendly techniques.	
Plan	MN-3-1	Establish a plastics recycling system.	
Intervention area	Gabes, Gafsa, Medenine, Kebili, Tozeur	Implementing agency	Ministry of Industry, Ministry of Environment, National Agency for Waste Management
Description			
<p>Plastics and other products litter much of the Southern region. This waste diminishes the attractiveness of the region as a tourist destination.</p> <p>There are two recycling firms for plastic products, but they typically operate at under-capacity because there is a limited number of waste collectors. People are reluctant to work as waste collectors because they are considered lower class.</p> <p>Public support of plastics recycling including financial and technical programs for recycling industries and the establishment of a plastics recycling system will encourage sustainable use of resources and the improvement of the environmental landscape.</p>			
Action plan			
Actions		Relevant organizations	Role
- Establish laws to promote plastics recycling.		- Ministry of Industry - Ministry of Environment - National Agency for Waste Management	- National Agency for Waste Management Ministry of Environment, and Ministry of Industry establish the laws stipulating government and individual roles for plastics recycling.
- Establish glass and rubber recycling plants.		- National Agency for Waste Management	- National Agency of Waste Management establishes glass and rubber recycling plants.
- Support for recycling firms.		- APII	- APII includes recycling sector in the list of investment promotion and provides financial incentives for investments in these products or related activities.
- Introduce of new equipment and technologies for efficient, large-scale recycling of plastics.		- MoFA	- MoFA seeks financial aid and/or technology transfer programs to introduce new recycling technology and equipment from overseas.
- Promote public awareness for recycling.		- Ministry of Environment	- Ministry of Environment conducts public awareness campaigns to increase the plastics recycling ratios.
Indicator			Risk
- Plastics recycling ratios to increase by 50% by 2025.			- Not identified.

Strategy	MN-3	Establish sustainable manufacturing activities by developing recycling and promoting environmentally friendly techniques.	
Plan	MN-3-2	Promote environmentally friendly techniques in the chemical and mining sectors.	
Intervention area	Gabes, Gafsa	Implementing agency	National Agency for Environmental Protection, APII
Description			
<p>The biggest constraint for the chemical industry in the Southern region is the environment, which is affected by the phosphate production process. For example, phosphate gypsum, a side product of phosphate acid processing, has been dumped into the sea causing water pollution. Additionally, the emissions of SO₂ and mercaptants are causing air pollution in the proximity of Gabes' chemical firms.</p> <p>Because these problems create tension between the chemical firms and local communities, technical and financial support to help firms recycle phosphate gypsum and decrease air pollutants would be beneficial to sustainable sector development.</p>			
Action plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Establish a monitoring system to measure air pollutants and waste generated by the chemical sector. 	<ul style="list-style-type: none"> - National Agency for Environmental Protection - International Center for Environment Technologies in Tunis (CITET) 	<ul style="list-style-type: none"> - National Agency for Environmental Protection establishes a monitoring system to measure air pollutants and waste such as SO₂, mercaptants, and phosphate gypsum. 	
<ul style="list-style-type: none"> - Investment in environmentally friendly techniques and equipment. 	<ul style="list-style-type: none"> - APII - Technopole 	<ul style="list-style-type: none"> - APII and technopole provide financial support for environmentally friendly techniques and equipment. 	
<ul style="list-style-type: none"> - Introduction of new technologies to reduce waste. 	<ul style="list-style-type: none"> - MDCI 	<ul style="list-style-type: none"> - MDCI seeks financial aid and/or technology transfer programs to introduce new recycling technology and equipment from overseas. 	
<ul style="list-style-type: none"> - Introduction of environmental management systems by firms. 	<ul style="list-style-type: none"> - Ministry of Industry and INNORPI 	<ul style="list-style-type: none"> - Ministry of Industry and INNORPI to encourage the introduction of ISO14001 by providing subsidies for application and training. 	
<ul style="list-style-type: none"> - Introduction of water-saving technology by chemical and mining sector firms. 	<ul style="list-style-type: none"> - Ministry of Industry - ANPE 	<ul style="list-style-type: none"> - ANPE conducts a study on water-saving technology (such as reuse, recycle, and reduce water use) suitable for the chemical and mining sectors in the South. - Ministry of Industry and ANPE promote water-saving technology in sector firms. 	
Indicator			Risk
<ul style="list-style-type: none"> - The amount of waste spillage will decrease by 20% by 2025. - The amount of pollutant spillage will be decrease by 20% by 2025. - The ratio of ISO 14001-certified firms will reach 30% of the chemical and mining sector by 2025. - The ratio of firms using new water-saving techniques will reach 50% of the chemical and mining sector by 2015. 			<ul style="list-style-type: none"> - Not identified

Sector	Strategy	MN-4	Upgrade textile industry production activities and extend the product ranges.	
	Plan		Actions	Term
Mining and manufacturing	MN-4-1: Promote the apparel sector design and product development activities.		<ul style="list-style-type: none"> - Human resources development for design and product development. - Promote investment in design and product development activities. - Promote Southern-brand apparel products in international markets. 	Short-medium
	MN-4-2 Promote the linkages in the textile sector to enhance new business opportunities and investment.		<ul style="list-style-type: none"> - Establish a study group among textile firms. - Establish information-sharing system for stakeholders. - Hold matching events. 	Short-medium
	MN-4-3 Enhance the textile sector productive capacity.		<ul style="list-style-type: none"> - Promote textile sector investment. - Textile industry human resources development. - Improve firm productivity through consultations. 	Short-medium

Strategy	MN-4	Upgrade textile industry production activities and extend the product range.		
Plan	MN-4-1	Promote apparel sector design and product development.		
Intervention area	Gafsa, Tozeur, Medenine, Tataouin	Implementing agency	APII, Ministry of Vocational Training and Employment	
Description				
<p>There is some textile industry agglomeration of firms in the South. The industry possesses limited competitive advantages because most firms engage only in cutting and sewing (which is highly labor-intensive) and lacks high value-added processing activities.</p> <p>The project will nurture the apparel design and product planning activities, which are more skill-intensive, in the Southern region.</p>				
Action plan				
Actions		Relevant organizations	Role	
- Human resources development for design and product development		- Ministry of Vocational Training and Employment	- Ministry of Employment establishes training courses for design in the Southern region.	
- Promote design and product development investment.		- APII - CETTEX	- APII and CETTEX includes textile design and product development in the list for investment promotion and provides financial incentives for investment in these products or related activities	
- Promote the Southern brand apparel products in international markets.		- APII - UTICA	- APII and UTICA collaborate to implement the promotional strategy. - CEPEC promotes textile products made in the South by participating in exhibitions.	
Indicator			Risk	
<p>- Training courses established by 2020.</p> <p>- More than two textile firms in the South will engage in design and/or product development activities by 2025.</p>			- Not identified	

Strategy	MN-4	Upgrade the textile industry production activities and extend the product ranges.	
Plan	MN-4-2	Promote the linkages in the textile sector to enhance new business opportunities and investment.	
Intervention Area	Gafsa, Tozeur, Medenine, Tataouin	Implementing agency	UTICA, APII
Description			
Textile production is characterized as a complex supply chain system that involves the processing of raw material (such as cloth), designing, patterning, dyeing, and sewing. After nurturing firms in the various stages of the textile industry through MN-4-1, this plan aims to develop the information spillover that promotes the matching of firms and creates new products and business opportunities.			
Action plan			
Actions	Relevant organizations		Role
- Form a textile industry association.	- UTICA - APII		- UTICA creates an industry association for textiles in the South with textile-related firms.
- Establish an information-sharing system for stakeholders.			- The association conducts information gathering from stakeholders, market, and technology research for textile sector development. - The association establishes the information-sharing system, which includes the market and industry information. This system will be used by all the textile sector stakeholders. - APII gives necessary (financial) support to the study group to establish the system.
- Hold matching events.			- APII and UTICA hold the matching events for producers and users or seminars which promote new business opportunities.
Indicator			Risk
- Study group set up by 2020. - Information-sharing system established by 2020. - More than five matching events conducted by 2025.			- Not identified

Strategy	MN-4	Upgrade textile industry production activities and extend the product ranges.	
Plan	MN-4-3	Enhance the productive capacities of the textile sector.	
Intervention area	Gafsa, Tozeur, Medenine, Tataouin	Implementing agency	UTICA, APII
Description			
The availability of sufficient production capacity for textile products would be a prerequisite for skills upgrading and production capability in the Southern areas. The plan aims to increase the scale of textile production.			
Action plan			
Actions		Relevant organizations	Role
- Promote investment in the textile sector.		- UTICA - APII - Ministry of Vocational Training and Employment	- APII includes textile sector to the list for investment promotion and provides financial incentives.
- Textile industry human resources development.			- Ministry of Vocational Training and Employment establishes vocational training courses for textile activities.
- Improve firm productivity through consultations.		- Ministry of Industry	- Ministry of Industry arranges consulting services such as strategic planning and 5S to firms.
Indicator			Risk
<ul style="list-style-type: none"> - The number of firms in the textile sector will increase by 30 by 2025. - The number of sector employees in the sector will increase by 1,000 by 2025. - The number of firms receiving consultation services will exceed 10 by 2025. 			- Not identified

Sector	Strategy	MN-5	Fostering a manufacturing base and services for solar (renewable) energy.	
	Plan		Actions	Term
Mining and manufacturing	MN-5-1: Strengthening the SWH system value chain.		Applicable to both plans – Strengthening regional knowledge base and targeting. – Human resource development. – Pilot project(s) investment. – Improvement in the business environment and organic infrastructure for innovation. – Promote regional clustering of manufacturing and services units. – Encourage private sector initiatives. – Plan holistic approaches for the adoption of green energy for local development and foster synergy creation among sectors and local livelihoods.	Short-medium
	MN-5-2: Build a foundation to produce components of PV modules, systems, and related services.			

Strategy	MN- 5	Fostering a manufacturing base and solar (renewable) energy industry services in the Southern region.		
Plan	MN- 5 -1	Strengthening SWH system value chain.		
Intervention area	Six governorates, with Médenine and Gafsa as candidates for manufacturing bases.	Implementing agency	ODS in coordination with ANME and APII	
Description				
<p>The Government of Tunisia has progressively taken measures to adopt renewable energy in the context of rising fossil-based energy costs. Donor-financed national programs such as PROSOL I and II have facilitated the adoption of SWH systems in residences country-wide and played an important role as drivers of equipment and services demand. Although SWH systems have become increasingly recognized as affordable and suitable energy solutions favorable in the Tunisian context and the domestic market continues to grow, industry evolution has not been accompanied by national capacity development to meet the demand.</p> <p>The proposed plan will strengthen the SWH system value chain including component manufacture, system assembly, and the relevant services. The absence of industry is evident in the southern region of the country, where there is only one SWH equipment assembly company operating in Médenine, and that company is reportedly meeting only 5% of local demand because of its current operating capacity. Because of the incipient development stage of the sector, strengthening the value chain will require strong political leadership to instigate interest amongst potential collaborators and to encourage investment. Within the value chain, the service area has the potential to expand because installing and maintenance needs are expected to increase.</p>				
Action plan				
Actions	Relevant organizations	Role		
- 1. Strengthening regional knowledge base and targeting.	- ODS - Regional Development Taskforce	- (ODS) plans and oversees technical evaluations. - (ODS together with the Regional Development Taskforce) discuss and elaborate growth visions; establish institutional/inter-institutional collaboration framework.		
- 2. Human resources development.	- ANME - Technopoles - Academic and research institutes - Ministry of Employment	- R&D. - Training of experts and technicians. - (Ministry of Employment) develops a program to train human resources in the green economy.		
- 3. Investment in demonstration and improvements in the business environment and infrastructure for innovation.	- ANME and ODS - Techno-poles (IRA, Borji Cedria) - Ministry of Industry (including APII) - FIPA - Financing entities	- (ODS) collects and organizes information; coordinates relevant actors and investors. - (Financing entities) mobilize resources, development adequate financing schemes and provide credits/loans/grants. - (FIPA) promote investment opportunities. - (ANME and ODS) information exchange, coordination, monitoring. - (Techno-poles and Ministry of Industry) direct relationship management with potential collaborators in the country and abroad. - (FIPA) promote investment.		
- 4. Activation of clustering for manufacturing and services.	- API, APIA, STEG - Technopoles - ODS	- Investment incentives for innovative companies. - Incubation support.		
- 5. Advancing private sector-led clustering and synergy creation with wider array of local economies.	- ODS - Regional Development Council - API, APIA - FIPA	- (ODS and FIPA) investment promotion. - (ODS, Regional Development Council, API, APIA) boost incubation linked with other local clusters and livelihood improvements.		
Indicator		Risk (external conditions)		

<ul style="list-style-type: none">- The number of newly established manufacturers and relevant services in the Southern region and their production/attendance capacities.- Sales of the Southern region-based companies.- Market share of the Southern region-based companies in the domestic market.- Volume and size of public and private investments.	<ul style="list-style-type: none">- Imported SWH equipment becomes cheaper.- Technological transfer does not materialize internally.- Financing options remain limited.
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Strategy	MN- 5	Fostering a manufacturing base and service for solar (renewable) energy industry in the Southern region.	
Plan	MN- 5 -2	Building a foundation to produce PV component modules, systems, and related services.	
Intervention Area	Six governorates, with Médenine and Gafsa as candidates for manufacturing bases.	Implementing agency	ODS in coordination with other principal organizations.

Description

With over 300 sunny days a year, solar radiation is an abundant and sustainable source of energy in most parts of Southern Tunisia. PV is applicable to various economic activities conducted in these regions including agriculture (mostly for irrigation, agriculture water pumping, and water desalination), tourism (hospitality and entertainment), industrial energy efficiency, and general electricity usage such as lighting, communication, and education (roof-top PV).

The government's commitment to the national renewable energy strategy and framework will create a sustainable local market for solar panels and other system components and materials, including system installation and maintenance. As the Southern region promotes investments in the industrial zones, the energy demands in the future will exceed those of today. The sustainable local market will facilitate national and international investments in the local production of modules, inverters, structures, cables, transformers, solar cells, silicon material, and other basic materials such as glass, metals, and concrete.

International trends show dominant performance by Chinese suppliers in the market while the largest importers are mostly found in European countries such as Germany, Italy, and France where the installation of MW-scale PV systems has increased substantially each year.

The proposed plan will seize perceived opportunities in accordance with the expected growth in local and external market demand and capitalize on the building of a foundation to produce PV components and strengthen related service sectors. Additionally, considering the 20 to 25 year lifespan of PV, replacement and waste disposal of old modules will increase after the year 2015 to the year 2020, which implies additional R&D needs concerning recycling/waste management technologies and relevant business and growth opportunities.

Table: Indicative figures for PV businesses

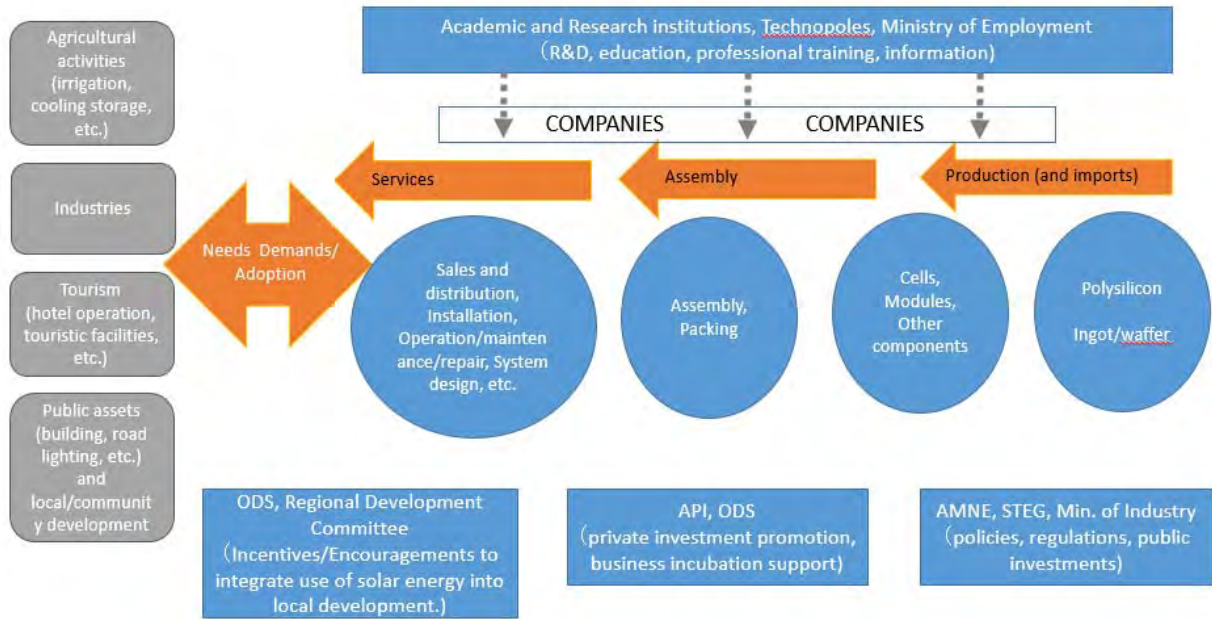
Year	2010	2020	2030	2050
World PV (cumulative)	~20GW	140GW	800GW	10TW
System cost (USD/W)	4,50	2,34	1,33	0,91
Annual world PV installation	4,4GW	24GW	120GW	1TW
World PV market size (USD million/yr)	19,6	55,7	162	908
VLS-PV market size including replacement (USD billion/yr)	0,9	5,1	23,2	214
Annual expenditure for VLS-PV (USD billion/yr)	0,2	2,3	13,8	181

Source: Energy from the Desert

Action Plan

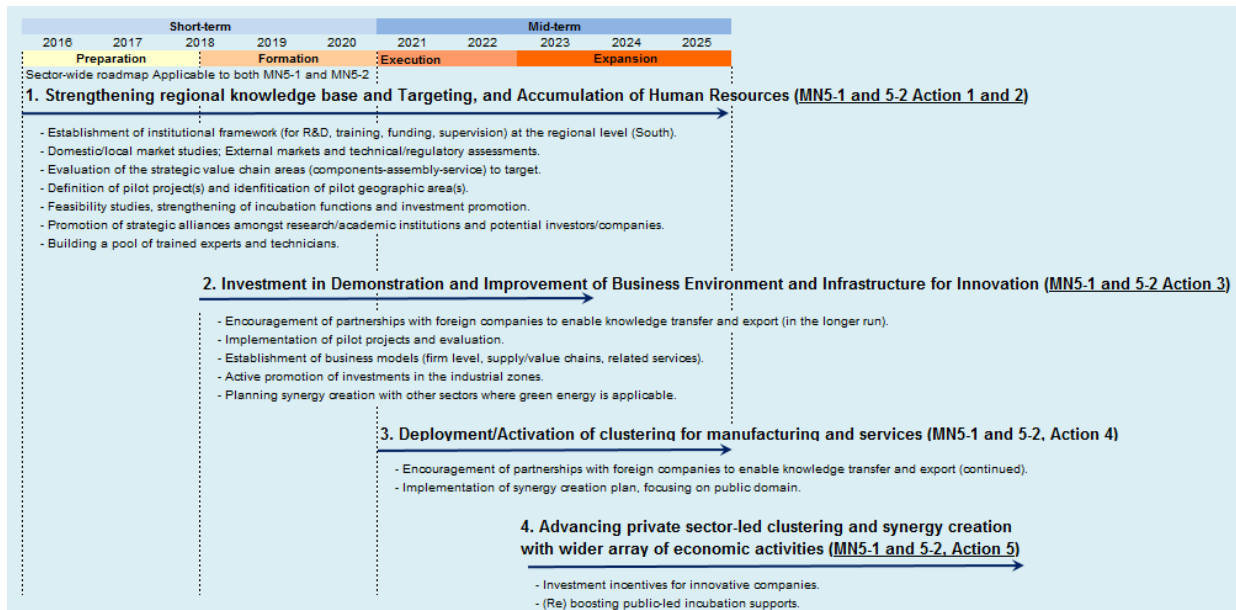
Actions	Relevant organizations	Role
- 1. Strengthening regional knowledge base and targeting.	- ODS - Regional Development Taskforce	- (ODS) plans and oversees technical evaluations. - (ODS together with Regional Development Taskforce) discuss and elaborate growth visions; establish institutional/inter-institutional collaboration framework.
- 2. Strengthening of human resources.	- ANME - Technopoles - Academic and research institutes - Ministry of Employment	- R&D. - Training of experts and technicians. - (Ministry of Employment) develops human resources training in the green economy.
- 3. Investment in demonstration and the improvement of the business environment and infrastructure for innovation.	- ANME and ODS - Techno-poles (IRA, Borji Cedria) - Ministry of Industry (including APII) - FIPA	- (ODS) collects and organizes information; coordinates relevant actors and investors. - (Financing entities) resource mobilization, development of adequate financing schemes and provision of credits/loans/grants. - (FIPA) promotes investment opportunities.

	<ul style="list-style-type: none"> - Financing entities 	<ul style="list-style-type: none"> - (ANME and ODS) information exchange, coordination, monitoring. - (Technopoles and industry ministry) Direct relationship management with potential collaborators in the country and abroad. - (FIPA) promotes investment.
<ul style="list-style-type: none"> - 4. Activation of clustering for manufacturing and services. 	<ul style="list-style-type: none"> - API, APIA, STEG - Technopoles - ODS - 	<ul style="list-style-type: none"> - Investment incentives for innovative companies. - Incubation support.
<ul style="list-style-type: none"> - 5. Private sector-led clustering and synergy creation with a wider array of local economies. 	<ul style="list-style-type: none"> - ODS - Regional Development Council - API, APIA - FIPA 	<ul style="list-style-type: none"> - (ODS and FIPA) promotion investment. - (ODS, Regional Development Council, API, APIA) boosting incubation linked with other local clusters and livelihood improvements.
Indicator		Risk (external conditions)
<ul style="list-style-type: none"> - Number of newly established manufacturers and relevant services in the Southern region and their production/attendance capacities. - Sales of Southern region-based companies. - Market share of Southern region-based companies in the domestic market. - Technology adoption by different domains of economic activities. - Volume and size of public and private investment. - 		<ul style="list-style-type: none"> - Cheaper imported PV. - Technological transfer does not materialize internally. - Financing options remain limited.



Elaboration by JICA expert.

Figure 3.2-1 Image of sector clustering



Elaboration by JICA expert.

Figure 3.2-2 Implementation plan scheduling for MN5-1 and MN5-2

3.2.3 Tourism

(1) Summary of current condition analysis and major development issues

(a) Summary of current condition analysis

The results of the Porter's Diamond Analysis, detailed in the Chapter 5.4 of PART 1 of this report, are summarized in the following Table 3.2-13. In terms of the factor condition, the region has rich and prominent tourism resources that tourists can enjoy. Existing infrastructure also encourages the tourists to travel around the region. From the view point of demand condition, some sophisticated demands for higher quality were observed in the region, because the main constraints identified are mostly related to the quality or diversity of services. Such requirement to improve the quality of services to meet with the high-end tourists or to personalize the services to specific segmentation will be the most important motivation for developing the competitiveness. Supporting industries, such as hotels, restaurants, travel agencies, entertainments, which ensure the requirements from tourists, have also been developing since the 1960's in the region. In terms of the institutional structure of the tourism sector, the ONTT, the FTAV and the FTH were established to develop the tourism through collaboration between the public and private sector.

In conclusion, it could be said that, although there are many things need to be improved, the region has outstanding tourism resources and basic conditions required for competing with other regions in Tunisia and also with other countries in the international tourism market.

Table 3.2-13 Porter's Diamond Analysis on Tourism in the Southern Region

Factors	Factor conditions	Demand conditions	Related and supporting industries	Firm strategy, structure, and rivalry
Description	<p>1. Tourism resources</p> <ul style="list-style-type: none"> • Beaches activities • Archaeological sites • Berber villages • National parks • The Sahara • Oasis • Old Médina • Thermal springs • Souk • Agricultural landscapes • Museums • Festivals • Handicrafts <p>2. Infrastructure</p> <ul style="list-style-type: none"> • 3 international airports • 2 commercial ports • Railway networks • Road networks <p>3. Investment</p> <ul style="list-style-type: none"> • 53 Million TND (2012) <p>4. Human resources</p> <ul style="list-style-type: none"> • 2 hotel schools 	<p>1. Target segmentation</p> <ul style="list-style-type: none"> • Lack of products for high-end tourists <p>2. Sophistication of the demand</p> <p>Main constraints identified by 50 travel agencies are:</p> <ul style="list-style-type: none"> • Regional security • Management of tourist sites • High quality services in hotels and restaurants • Adequate transportation services • Qualified workers • Environmental pollution • Seasonal unprofitability 	<p>1. Services and products</p> <p>Various services and products are provided by local companies, including:</p> <ul style="list-style-type: none"> • 250 hotels with 62,059 beds • 46 touristic restaurants • 178 travel agencies • 2 Golfs • 1 Casino • Horseback riding • Scuba diving • Quad riding. • Excursions to the Sahara • Camel caravan 	<p>1. Public sector</p> <p><ONTT></p> <ul style="list-style-type: none"> • Policy making • Promotion • Quality control inspection • Monitoring <p>2. Private sector</p> <p><FTAV></p> <ul style="list-style-type: none"> • Syndicate composed of local travel agencies for improvement of business circumstances. <p><FTH></p> <ul style="list-style-type: none"> • Syndicate composed of local hotel owners for improvement of business circumstances.

Source: JET

(b) Major development issues identified

While the Southern region has rich tourism resources, several issues have been observed as the constraints of the tourism development in the region. The main constraints identified have been: (i) seasonality of tourism, including a lack of diversity; (ii) promotion of “Destination”, particularly establishing regional identities in order to move away from the mass beach tourism; and (iii) quality of the current facilities, particularly degradation of the aging hotels and infrastructure; and (iv) quality of services, particularly lack of qualified professionals.

(2) Strategies and plans

Based on the results of the Porter’s Diamond Analysis, and in order to realize the development Scenario 3 proposed in former chapter, the following five strategies, especially promotion of destination, could be proposed for creating a cluster in the tourism sector and for ensuring sustainable tourism development in collaboration with public and private sector including local people.

Table 3.2-14 Tourism Development Strategy in the Southern Region

Code	Strategy	Effect (Direct / Indirect)			Indicator
		Value-added	Job creation	Sustainability	
TM-1	Creation and promotion of destinations for all seasons in the Southern Region.	Improvement of revenue, especially in the low season	Improvement of the situation of seasonal employment	Improvement of social stability	1. Hotel occupancy rate 2. Number of nights spent 3. Number of visitors to the Southern Region
TM-2	Development of tourism services to meet with international standards.	Inviting high-end tourists Inviting various tourists in different segmentations	Creating new types of jobs, e.g. therapists, sommelier, interpreter	Improvement of basic infrastructure	1. Number of professional licences held 2. Establishment of new hotel standards 3. Number of hotels with classification 4. Repeater rate of tourists
TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern Region.	Exploiting new tourist sites and new products through developing local heritages	Creating new types of jobs especially for highly educated people, e.g. professional tour guide, mediator	Conservation of local heritages and natural resources	1. Establishment of site management plan 2. Number of sites registered on the national and/or UNESCO world heritage list 3. Number of artisans with official certification
TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society.	Promoting tourism that directly benefits local people	Involving local people in tourism Creating new jobs for local tour services	Raising public awareness of local culture and responsibility for protecting local environment	1. Number of professional licences held by local people 2. Hotel occupancy rate of local accommodation 3. Number of clean-up campaigns conducted
TM-5	Exploitation of agro-tourism by collaboration with agriculture sector.	Promoting sales of local products	Creating more jobs for local farmers	Improvement of social stability	1. Sales of agricultural products

Source: JET

(a) TM-1: Creation and promotion of destinations for all seasons in the Southern region

(i) Objective of the strategy

To identify destinations away from the beach tourism is a critical issue for resolving problems of seasonality. A definition of the term “destination” is:

The boundary of a “Destination” is determined by marketing as well as physical and cultural limit. Thus, the market may perceive an entire country as a destination (as marketed by a tourism ministry) or a single national park, such as Iguazu National Park in Argentina. The term “site” overlaps significantly with “destination” but tends to centre on a particular place bound by physical or cultural characteristics. Many “sites” often constitute a single “destination” such as the principal temples of Tikal National Park, or multiple historical buildings in the Historic Centre of Vienna.³

In other words, “Destination” is the essential motivation of travel that attracts tourists or the final goal where tourists will visit. A “Destination” can be also determined as a cluster in the tourism sector.

Considering characteristic and potential of the tourism resources in the region, the below three destinations are proposed. Proposed three destinations are combined with a typical colour which presents the characteristic of the destination as the “theme colour” and each destination consists of the main product which best represents and promotes the destination and sub-products that a tourist who visits the destination can also enjoy as an optional tour.

Table 3.2-15 Potential destinations in the Southern Region

Destination		Target Governorate	Orientation of Development	Main Product	Sub-products (Example)
1	Bleu - Méditerranée	Médenine, Gabès	“Relaxation” “Health” “Organic”	Vacation in the beautiful Mediterranean Sea	Sport tourism, Medical tourism, MICE tourism (*), Agro-tourism, Culture tourism
2	Terre - Berbère	Gabès, Tataouine, Médenine	“Originality” “Tradition” “Authenticity”	Berber culture tourism	Thermal tourism, Agro-tourism
3	Rose - Sahara	Gafsa, Tozeur, Kébili, Tataouine	“Nature” “Peace” “Eternity”	Ecotourism in the Sahara and oases	Sport tourism, Mechanical tourism, Thermal tourism MICE tourism Culture tourism

Source: JET (*) MICE: Meetings, Incentives, Conferences and Exhibitions

< Destination “Bleu – Méditerranée” >

To spend summer vacation in the Mediterranean coast is the first motivation for tourists to visit Tunisia since the 1960’s and Djerba-Zarzis is the top tourism destination which accepts a million tourists per year.



Djerba

Ruins of Rome “Gightis”

³ USAID « TOURISM DESTINATION MANAGEMENT Achieving Sustainable and Competitive Results » 2011

The blue colour represents the beautiful Mediterranean Sea and the blue sky contrasting with the white sand beaches. The doors and window shutters of traditional houses in Djerba are also coloured in blue. Archaeological sites in the region, such as Gigtis, Meninx, are also coloured with Mediterranean culture, as it is a crossroad of various people from across the sea.

Meeting with the recent trend of tourism for vacations, this destination will offer comprehensive services for relaxation and health to tourists where tourists can escape from daily life in the beautiful and calm environment along the Mediterranean Sea. Sport tourism (diving, golf, etc.), MICE tourism and agro-tourism could be also developed as a sub-product of the destination. On the other hand, all activities must be controlled in order to conserve the beautiful and limited natural resources.

< Destination “Terre – Bérbere” >

In spite of the great potential for tourism, traditional Berber villages and architecture, such as the Ksour, cave dwelling, has not been sufficiently promoted yet as a tourism resources. The French word “Terre” means territory,



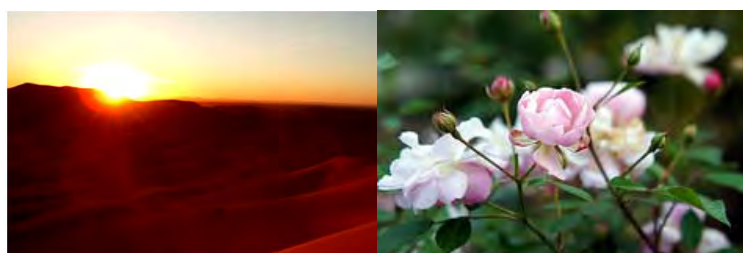
Ksour Mrabtine

Guermessa

land or soil and this destination will provide culture tourism within the Berber territory located in inland mountain area. “Terre” is the colour of dry soil and it represents the dry climate of the inland area and construction materials of traditional Berber architecture. This destination will offer tourists comprehensive information about and experiences of Berber’s traditional, original and tribal ways of life through visiting the villages or experiencing agro-tourism within traditional agriculture landscapes such as “Jessour”. Tourists can also enjoy geo-thermal springs, in El Hamma, during tours as a sub-product of the destination.

< Destination “Rose – Sahara” >

According to the result of the tourism survey, many tourists bought an excursion to the Sahara desert. The rose colour represents the desert coloured with sunset and roses planted in oases that are used in aroma oils. Desert rose, a



Sunset in the Sahara

Rose in the Nefta Oasis

natural stone made of rose coloured sand, is also a famous souvenir that tourists can find in the region. This destination will offer ecotourism where tourists can enjoy the silent and natural atmosphere of desert and experience the traditional life of nomads by traversing the Sahara by camel and spending a silent night in a nomadic tent under the stars. To promote this destination will be one of solutions for improving the current situation of seasonality, because tourism in the Sahara is more preferable during autumn and winter to avoid high temperatures of more than 50 °C in summer. Tourists can also enjoy mechanical tourism as a sub-product, but this kind of tourism should be controlled strictly and be

separated spatially away from the ecotourism in order to guarantee silent and natural atmosphere in the Sahara.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and for social and environmental sustainability:

- 1) Improvement of revenue from tourism, especially in the low season;
- 2) Improvement of the situation of seasonal employment;
- 3) Improvement of social stability by providing permanent jobs.

(iii) Indicators

In order to measure the effect and impact of the strategy, the following indicators are proposed:

- 3) Hotel occupancy rate;
- 4) Number of nights spent;
- 5) Number of beds exploited;
- 6) Number of jobs created related to the hotel services.

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

- Establish the “Destination Management Organization (DMO)” by collaborating with all stake holders;
- Marketing and auditing in order to identify the tourists’ demands and segmentations;
- Define destinations in order to invite the tourist throughout the year;
- Establish laws, standards or “Cahier des charge” for hotels, travel agencies, restaurants and transport services in order to promote and protect the destinations’ tourism resources;
- Establish destination contracts for five years (2020-2025) between relevant agencies;

Mid-term (2020-2025):

- Organize a press or familiarization (FAM) trip;
- Promote the destinations to domestic and international markets.

< Facility and infrastructure development plan >

The strategy will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Create a web site for promoting the destinations;
- Create advertisement materials for promoting the destinations.

Mid-term (2020-2025):

- Exhibit destinations' information stands in international travel forums and expositions;

< Financial and investment plan >

The strategy will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Mobilize state budget, especially for the DMO.

Mid-term (2020-2025):

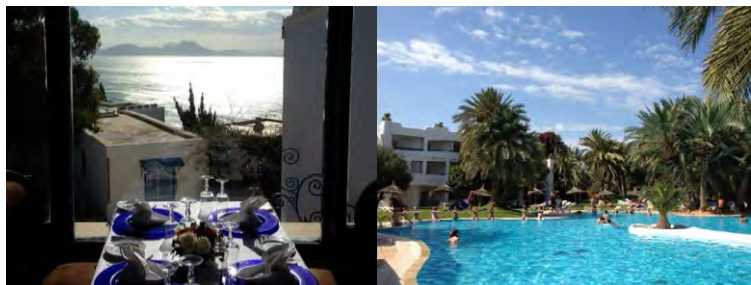
- Create a regional/local taxation system "Tourism tax", especially using for regional/local tourism development.

(b) TM-2: Development of tourism services to meet with international standards

(i) Objective of the strategy

Supporting industries, such as hotels, restaurants, public transportations, travel agencies and entertainments that ensure the requirements from tourists have been developed since 1960's in the region. According to the results of the tourism survey conducted during the diagnostic phase of the JICA survey, the main constraints in the region are mostly related to the quality of services or diversity of services. Therefore, improvement of the quality of services meeting with the high-end tourists or personalization of the services to specific segmentations will be the key interventions in order to develop the tourism sector in Tunisia.

On the other hand, regarding the quality of accommodation or restaurants, some standards are already established in Tunisia; however, quality of services or facilities is sometimes quite different from each establishment with same ranking. Therefore, revision of the standards to meet with international



Tourist Restaurant
(Sidi bousaid)

Hotel in tourist zone (4stars)
(Zarzis)

standards will also be required. Diversification of accommodation and restaurants are also required according to the new trends of tourism, such as ecotourism, agro-tourism and medical tourism.

In addition to the above, when we improve the quality of services, human resource development is also required. In particular, to meet with new tourism services, park rangers for ecotourism, therapists for thalassotherapy, interpretation services for international conferences and sommeliers for high-end restaurants are required and provision of official training and a licensing system are necessary for ensuring the quality of services.

Regarding transportation services in the region, there are limited public transportation services for individual tourists and their quality is not suitable for tourists in terms of comfort and frequency.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and for social and environmental sustainability:

- 1) Improvement of revenue from tourism by inviting various types of tourists in different segmentations including high-end tourists;
- 2) Improvement of the employment situation by creating of new jobs, especially for highly educated people; for example, medical therapists, skilled sommeliers and professional interpreter;
- 3) Improvement of basic infrastructure.

(iii) Indicators

In order to measure the effect and impact of the strategy, following indicators are proposed:

- 1) Number of professional workers who will obtain official licenses;
- 2) Establishment of new hotel standards;
- 3) Number of hotels which satisfy new hotel standards;
- 4) Accessibility to basic infrastructure in rural area.

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

- Establish laws, standards or “Cahier des charge” for alternative tourisms, such as ecotourism, medical tourism and thermal tourism, in terms of hygiene and protection of natural environment;
- Re-establish hotel and restaurant classification system and re-classify existing facilities to meet with international standards;
- Establish an official license system for new tourism services, such as for park rangers for

ecotourism, therapists for thalassotherapy, interpretation services for international conference, and sommeliers for high-end restaurants.

Mid-term (2020-2025):

- Create professional training schools (public or private);
- Recruit teachers to provide professional training for new tourism services;
- Provide professional training courses for new tourism services.

< Facility and infrastructure development plan >

The strategy will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Improve public transportation and infrastructure and rehabilitate aging facilities

Mid-term (2020-2025):

- Provide adequate facilities in order for tourists to enjoy the destinations, such as accommodation and restaurants to meet with international standards;
- Construct public facilities for alternative tourisms, such as international medical centre for medical tourism and international convention centre for MICE tourism.

< Financial and investment plan >

The strategy will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Mobilize the state budget, particularly for rehabilitation of public transport and construction of public facilities.

Mid-term (2020-2025):

- Provide subsidies for encouraging entrepreneurs who respects laws, standards or “Cahier des charge” regarding quality of services
- Modify the tariff system for public transportation.

(c) TM-3: Rehabilitation and conservation of material and immaterial heritages in the Southern region

(i) Objective of the strategy

As is mentioned above, while cultural and natural heritage located in inland areas have great potential for tourism, these types of heritage have not been well managed or promoted. Once the value of local cultural and natural heritage has disappeared, the region will lose not only their tourism resources, but

also lose the tourists that the regional economy depends on.

In addition, while Tunisia is trying to register some tourist sites on the UNESCO's world heritage list, such as Ksour in Tataouine, Oasis in Gabès and the Djerba Island, some serious problems may occur.



Ksour restored by inappropriate materials (Tataouine)

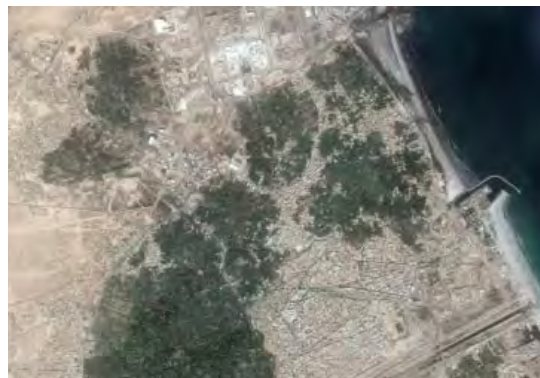
Abandoned Oasis (Gabès)

Traditional costume (Djerba)

For example, while the INP is restoring several Ksour in accordance with some technical standards, many Ksour were already transformed for commercial purpose in an inappropriate manner without having any consideration for historical heritage. Oases are also under threat from significant urbanization and desolation due to lack of appropriate management. Lack of water resources also has negative impacts on the productivity of crops from the oases and consequently farmers have already abandoned large parts of oases.

Therefore, rehabilitation and conservation of cultural and natural heritage is a critical issue in order to ensure sustainable tourism development in the region.

Immaterial heritage, such as traditional handicraft techniques and folklore, are also valuable tourism resources and thus should be conserved, protected, and passed on to the next generation. However, according to the lessons learned from recent experiences for promoting mass tourism all over the world, an increase in tourists sometimes causes negative impacts on the local traditions.



Significant urban sprawl to the Oasis (Gabès)

In this context, some management plans will be required for conservation of material and immaterial heritages in the region in order to maintain their value.

At the same time, from the viewpoint of environmental and social considerations, some measures to control the number of tourists have also to be taken to prevent negative impacts from the tourism, such as destruction of traditional culture, ethics and natural environments.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and for social and environmental sustainability:

- 1) Improvement of revenue from tourism by promoting new tourist sites and new products through developing local heritages;
- 2) Improvement of the employment situation by creating new types of jobs, especially for highly educated people; for example, professional tour guides and mediators;
- 3) Conservation of local heritages and natural resources.

(iii) Indicators

In order to measure the effect and impact of the strategy, following indicators are proposed:

- 1) Establishment of the site management plan;
- 2) Number of sites registered on the national and/or UNESCO's world heritage list;
- 3) Establishment of an official license system for artisans by the ONAT.

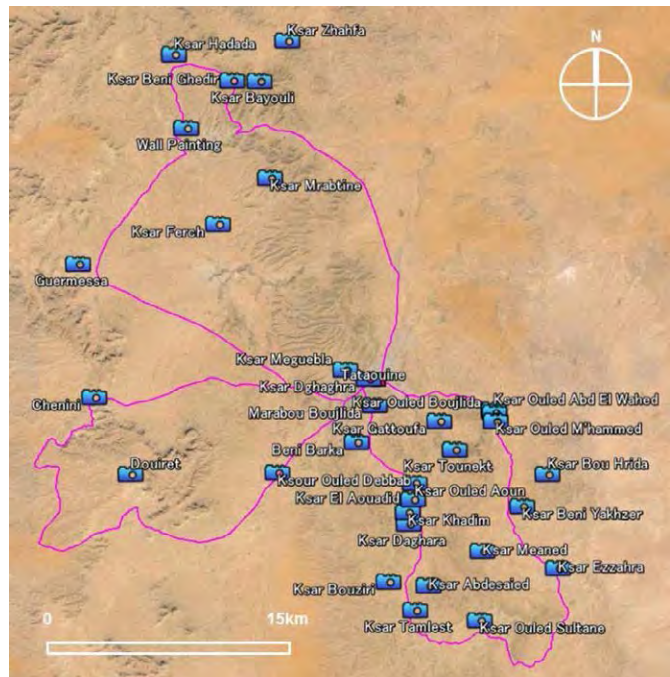
(iv) Development Plan

< Institutional and human capacity development plan >

The strategy will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

- Conduct an inventory survey of natural, archaeological and historical sites;
- Select priority sites to be protected and define the limit and zone for conservation on those sites;
- Establish management plan for natural, archaeological and historical site;
- Conserve immaterial heritage, such as artisans, music and dance.



Tourist circulation for the destination "Terre-Berber"
(Tataouine)

Mid-term (2020-2025):

- Register local heritages on the national and/or UNESCO's world heritage list.

< Facility and infrastructure development plan >

The strategy will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Create tourist circulation;
- Provide necessary transportation services for tourists to travel within the region;
- Furnish sign boards for tourists on the roads;
- Create access roads to sites and trail routes on the sites.

Mid-term (2020-2025):

- Develop tourist sites;
- Develop public facilities to facilitate or control tourists, such as public parking, toilets and trail route, in order to protect the sites;
- Develop public museums and archaeological sites.

< Financial and investment plan >

The strategy will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Provide subsidies to encourage local people who construct or rehabilitate private properties in protected areas in compliance with site management plan.

Mid-term (2020-2025):

- Revise entrance tariffs and ticketing systems for each site.

(d) TM-4: Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society

(i) Objective of the strategy

Tourism in Tunisia has been initiated and monopolized by major tour operators or foreign investors outside of the region and local people are not well involved. Consequently, the majority of revenue from tourism flows out of the region. Furthermore, tourism consumes local materials that local people also rely on, such as limited groundwater, natural environment and infrastructure.

As an antithesis of this conventional tourism in Tunisia, Community Based Tourism (CBT) is recommended. CBT is a form of tourism that aims to include and benefit local communities. Local people are able to host tourists in their village, manage the scheme communally and share the profits. The CBT intends to:



Maison d'hôte project by the TRANSAT (Canada)
(Beni khadache, Medenine)

- Promote tourism initiated by local people;
- Develop tourism with the involvement and consent of local communities (local people should participate in planning and managing);
- Share the profits from tourism with the local community;
- Respect traditional culture, ethics and natural environments;
- Have mechanisms to protect communities against negative impacts from tourists;
- Ensure that local people have the right to say “No” to tourism if they do not want it.

At the same time, the community will be aware of the value of their cultural and natural heritage and this will foster communal responsibility for conservation of these resources.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and for social and environmental sustainability:

- 1) Improvement of how local people benefit from tourism;
- 2) Improvement of the employment situation of local people by creating new jobs in local tourism services;
- 3) Rehabilitation and conservation of local environments by raising public awareness of local culture and responsible for local tourism.

(iii) Indicators

In order to measure the effect and impact of the strategy, following indicators are proposed:

- 1) Number of local people who will obtain official licenses;
- 2) Accessibility to basic infrastructure in rural area.

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

- Establish the “Community Based Tourism Organization (CBTO)” by collaborating with local people;
- Establish “Eco-museum” by collaborating with local people;
- Establish “Cahier des charge” for developing “Community Based Tourism (CBT)” in order that local people can invite tourists to the local community and to prevent negative impacts from

tourism to the local people and culture;

- To train local curators, mediators, official tour guides and park rangers for guiding around tourist sites;
- Provide seminars to the owners of local accommodations (Gite rural, Maison d’hote, etc.) and restaurants in order to promote the CBT with high quality services;
- Conduct awareness raising campaign to primary and secondary school students in order to raise their awareness and responsibility for local culture and environment;
- Conduct clean-up campaigns in order to prevent pollution and to control solid waste on tourist sites supported by local people, such as civil societies, NGOs and students.

Mid-term (2020-2025):

- Limit “All inclusive services” provided by large scale hotels that prevents local economy from tourism development;
- Reconsider urban design dividing tourists from local markets.

< Facility and infrastructure development plan >

The strategy will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Develop infrastructure that allow tourists to access rural areas, such as rural roads, transportation, telecommunication and the Internet;
- Improve basic infrastructure and facilities to ensure the safety of tourists who travel in rural areas, such as water supply, wastewater treatment, hospitals and police stations.

< Financial and investment plan >

The strategy will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Mobilize financial resources for small-scale projects provided by international cooperation agencies.

Mid-term (2020-2025):

- Provide a lending facility for small and medium sized entrepreneurs, such as owners of local accommodation and restaurants, in order to develop their businesses through providing preferable conditions; for example, grace period of more than two or three years, group lending and appropriate guarantee.

(e) TM-5: Exploitation of agro-tourism by collaboration with agriculture sector

(i) Objective of the strategy

Promoting some tourism products in collaboration with the agriculture sector also has great potential for new types of tourism. Agro-tourism is now widely known as a type of ecotourism where tourists can enjoy a wide range of agricultural activities that include harvesting fruits and vegetables; riding animals; tasting local agricultural products; learning about making wine, olive oil or cheese; or shopping for local products by staying on local farm land or in a farmer's house. The agricultural landscapes, such as oases, olive groves and "Jessour", also have a potential to be tourism resources, as a part of the cultural heritage salient to the region.

The handicraft sector is also closely associated with the tourism and agriculture sector and the region has many handicraft products made of local agricultural materials.

In this context, in order to make the most of regional resources, the agriculture sector has to be well integrated with tourism development in close collaboration with different ministries and organizations.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and for social and environmental sustainability:

- 1) Improvement of revenue from tourism by promoting sales of local products;
- 2) Improvement of the employment situation by creating more jobs for artisans and farmers;
- 3) Improvement of social stability by providing permanent jobs.

(iii) Indicators

In order to measure the effect and impact of the strategy, following indicators are proposed:

- 1) Number of local people who will obtain official licenses;
- 2) Sales of local products (agricultural and artisanal products).

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

- Establish an agricultural cooperative as a coordinating body for agro-tourism;
- Marketing and auditing appropriately in order to identify the tourists' demands;
- Exhibit local artisanal and agricultural products at international travel forums or expositions;

- Provide local specialties to tourists in collaboration with local farmers, hotels and restaurants;
- Modify the laws that prevent farmers having tourism on agricultural land;
- Provide necessary training for farmers to develop the agro-tourism.

Mid-term (2020-2025):

- Introduce traditional agricultural technique.

< Facility and infrastructure development plan >

The strategy will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Introduce a weekly farmers market inside “Tourist zone” for selling local agricultural and artisanal products to tourists;
- Rehabilitate agricultural landscapes to develop agro-tourism, such as oases, “Jessour” and olive groves.

Mid-term (2020-2025):

- Create a roadside commercial station or a regional shop stand (in hotels, airports, Tunis, foreign countries, etc.) for selling local agricultural and artisanal products.



Farmer's market
(Honolulu, Hawaii, USA)

Agro-tourism (Olive)
(Shodo-shima, Kagawa, Japan)

Roadside commercial station
(Fujioka-shi, Gunma, Japan)

< Financial and investment plan >

The strategy will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Mobilize financial resources for small-scale projects provided by international cooperation agencies.

Mid-term (2020-2025):

- Provide a lending facility for farmers by providing preferable conditions; for example, group lending and appropriate guarantee.

(3) Operation and effect indicators

Overall operation and effect indicators and target values expected to be achieved could be set for 2025 and 2035 by implementing five strategies and related action plans in the tourism sector as per Table 3.2-16.

The methodologies for estimating the target values are as follows:

- 1) The number of nights spent is proportionally related to tourists' expenditure and, thus, the natural annual growth rate of visitor export (expenditure) of 2.9 % estimated by the WTTC⁴ is applied as the growth rate of the number of nights spent for the future (baseline scenario);
- 2) In addition, the target increase in the number of nights spent in inland areas for the whole year is 15 % by 2025 and 30 % by 2035 more than the above baseline scenario by implementing the strategies;
- 3) The target increase in hotel occupancy rate is 3 % by 2025 and 5 % by 2035;
- 4) The number of beds exploited by 2025 and 2035 can be estimated based on 1) , 2) and 3) , above;
- 5) The number of direct and indirect employments can be approximated with the following formula⁵:

$$E_d = 0.39 b$$

$$E_i = 1.2 b$$

Where: E_d = Direct employments

E_i = Indirect employments

b = Number of beds exploited

Target values detailed for each governorate are indicated in Table 3.2-17.

⁴ WTTC: WORLD TRAVEL & TOURISM COUNCIL "Travel & Tourism ECONOMIC IMPACT TUNISIA 2014"

⁵ The direct and indirect employments: World Bank Report 2002

Table 3.2-16 Target indicators in Tourism development in 2025 and 2035 (Southern region)

1. Total number of nights spent / Year

Regions \ Year	2014 (Baseline)	2025	2035
Djerba-Zarzis-Médenine	7,186,590	9,842,200	13,099,230
Gabès	86,250	135,840	204,370
Tataouine	21,900	34,500	51,900
Gafsa-Tozeur	280,140	441,200	663,800
Kébili	198,600	312,780	470,590
Total	7,773,480	10,766,520	14,489,890
Increase of number of nights spent / Year		2,993,040	6,716,410

2. Number of beds exploited (annual average)

Regions \ Year	2014 (Baseline)	2025	2035
Djerba-Zarzis-Médenine	37,310	48,000	61,430
Gabès	1,710	2,210	2,980
Tataouine	500	630	840
Gafsa-Tozeur	4,900	6,480	8,800
Kébili	3,390	4,480	6,090
Total	47,810	61,800	80,140
Increase of number of beds exploited		13,990	32,330

3. Occupancy rate (annual average)

Regions \ Year	2014 (Baseline)	2025	2035
Djerba-Zarzis-Médenine	51.4%	54.4%	56.4%
Gabès	14.0%	17.0%	19.0%
Tataouine	12.2%	15.2%	17.2%
Gafsa-Tozeur	15.9%	18.9%	20.9%
Kébili	16.3%	19.3%	21.3%
Total	44.5%	47.5%	49.5%
Increase of occupancy rate		3.00%	5.00%

4. Number of direct employments (annual average)

Regions \ Year	2014 (Baseline)	2025	2035
Djerba-Zarzis-Médenine	14,549	18,719	23,958
Gabès	667	863	1,162
Tataouine	195	246	327
Gafsa-Tozeur	1,912	2,526	3,433
Kébili	1,324	1,746	2,373
Total	18,646	24,100	31,253
Increase of number of direct employments		5,454	12,607

5. Number of indirect employments (annual average)

Regions \ Year	2014 (Baseline)	2025	2035
Djerba-Zarzis-Médenine	44,767	57,596	73,717
Gabès	2,051	2,657	3,575
Tataouine	599	757	1,006
Gafsa-Tozeur	5,882	7,771	10,562
Kébili	4,073	5,373	7,302
Total	57,371	74,154	96,163
Increase of number of indirect employments		16,783	38,792

Source: JET

Table 3.2-17 Target indicators in Tourism development in 2025 and 2035 (by Gpvernorate)

(a) Djerba-Zarzis-Médenine

	2014 (Baseline)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (a)	9,431	21,268	35,439	13,714
Number of beds exploited (b)	32,214	39,797	42,464	34,748
Occupancy rate % (c = a/b)	29.3%	53.4%	83.5%	39.5%
Number of direct employments (b x 0.39)	12,564	15,521	16,561	13,552
Number of indirect employments (b x 1.2)	38,657	47,756	50,957	41,697

Source: ONTT

Total number of nights spent / Year	7,186,590
Average number of beds exploited	37,310
Average occupancy rate / Year	51.4%
Average number of direct employments	14,549
Average number indirect employments	44,767

Annual visitor exports (expenditure) growth rate 2014-2024 (r) 0.029

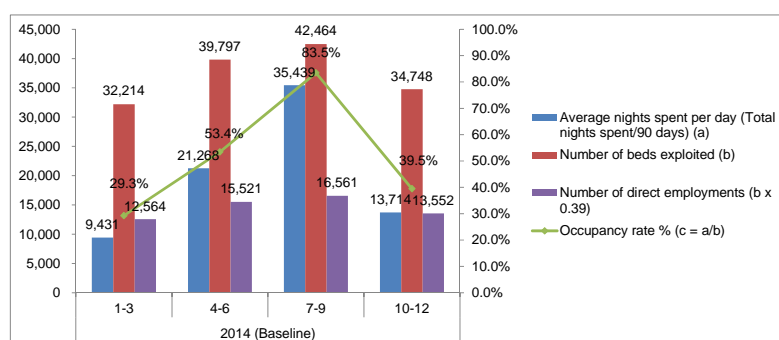
Source: WWTC Travel & Tourism Economic Impact 2014 TUNISIA

	2025 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (d = a x (r+1) ¹¹)	12,915	29,127	48,535	18,781
Number of beds to be required (e)	40,017	51,605	56,138	44,226
Occupancy rate % (c + 3%)	32.3%	56.4%	86.5%	42.5%
Number of direct employments (b x 0.39)	15,607	20,126	21,894	17,248
Number of indirect employments (b x 1.2)	48,021	61,926	67,365	53,071

Total number of nights spent / Year	9,842,200
Average number of beds exploited	48,000
Average occupancy rate / Year	54.4%
Average number of direct employments	18,719
Average number indirect employments	57,596

	2035 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (f = a x (r+1) ²¹)	17,189	38,766	64,596	24,996
Number of beds to be required (g)	50,152	66,332	73,026	56,214
Occupancy rate % (c + 5%)	34.3%	58.4%	88.5%	44.5%
Number of direct employments (b x 0.39)	19,559	25,870	28,480	21,923
Number of indirect employments (b x 1.2)	60,183	79,599	87,631	67,457

Total number of nights spent / Year	13,099,230
Average number of beds exploited	61,430
Average occupancy rate / Year	56.4%
Average number of direct employments	23,958
Average number indirect employments	73,717



(b) Gabès

	2014 (Baseline)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (a)	256	253	201	248
Number of beds exploited (b)	1,709	1,709	1,709	1,709
Occupancy rate % (c = a/b)	15.0%	14.8%	11.8%	14.5%
Number of direct employments (b x 0.39)	667	667	667	667
Number of indirect employments (b x 1.2)	2,051	2,051	2,051	2,051

Source: ONTT

Total number of nights spent / Year	86,250
Average number of beds exploited	1,710
Average occupancy rate / Year	14.0%
Average number of direct employments	667
Average number indirect employments	2,051

Annual visitor exports (expenditure) growth rate 2014-2024 (r) 0.029

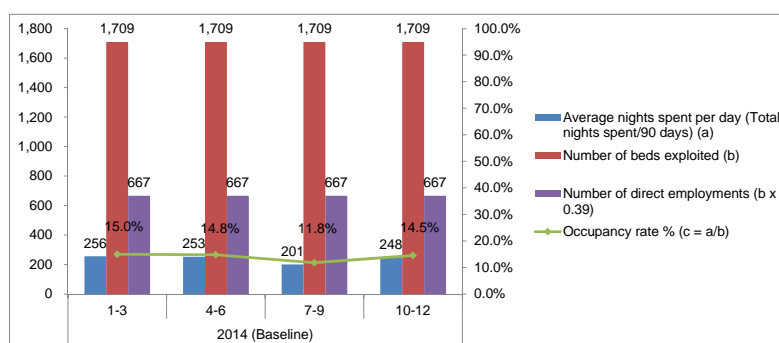
Source: WWTC Travel & Tourism Economic Impact 2014 TUNISIA

	2025 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (d = a x (r+1) ¹¹) (*1)	403	398	317	391
Number of beds to be required (e)	2,243	2,238	2,145	2,231
Occupancy rate % (c + 3%)	18.0%	17.8%	14.8%	17.5%
Number of direct employments (b x 0.39)	875	873	836	870
Number of indirect employments (b x 1.2)	2,691	2,685	2,574	2,677

Total number of nights spent / Year	135,840
Average number of beds exploited	2,210
Average occupancy rate / Year	17.0%
Average number of direct employments	863
Average number indirect employments	2,657

	2035 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (f = a x (r+1) ²¹) (*2)	607	599	477	589
Number of beds to be required (g)	3,036	3,026	2,842	3,013
Occupancy rate % (c + 5%)	20.0%	19.8%	16.8%	19.5%
Number of direct employments (b x 0.39)	1,184	1,180	1,108	1,175
Number of indirect employments (b x 1.2)	3,643	3,632	3,410	3,616

Total number of nights spent / Year	204,370
Average number of beds exploited	2,980
Average occupancy rate / Year	19.0%
Average number of direct employments	1,162
Average number indirect employments	3,575



(*1) The average nights spent per day in 2025 by implementing the strategy is targeted 15% more than those estimated with annual growth rate applied.
(*2) The average nights spent per day in 2035 by implementing the strategy is targeted 30% more than those estimated with annual growth rate applied.

(c) Tataouine

	2014 (Baseline)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (a)	61	61	61	61
Number of beds exploited (b)	499	499	499	499
Occupancy rate % (c = a/b)	12.2%	12.2%	12.2%	12.2%
Number of direct employments (b x 0.39)	195	195	195	195
Number of indirect employments (b x 1.2)	599	599	599	599

Source: ONTT

Total number of nights spent / Year	21,900
Average number of beds exploited	500
Average occupancy rate / Year	12.2%
Average number of direct employments	195
Average number indirect employments	599

Annual visitor exports (expenditure) growth rate 2014-2024 (r)	0.029
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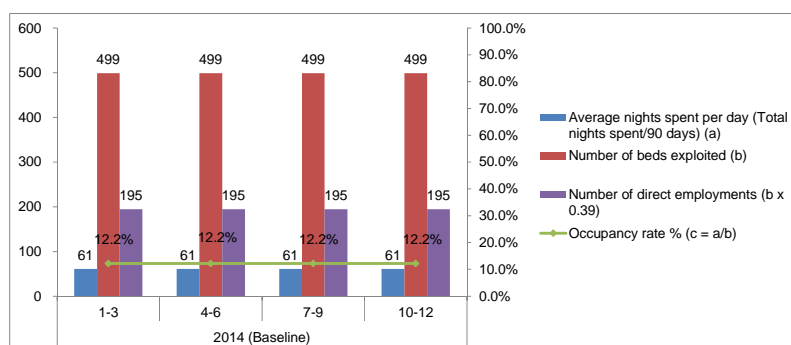
Source: WWTC Travel & Tourism Economic Impact 2014 TUNISIA

	2025 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (d = a x (r+1) ^{*11}) (*1)	96	96	96	96
Number of beds to be required (e)	631	631	631	631
Occupancy rate % (c + 3%)	15.2%	15.2%	15.2%	15.2%
Number of direct employments (b x 0.39)	246	246	246	246
Number of indirect employments (b x 1.2)	757	757	757	757

Total number of nights spent / Year	34,500
Average number of beds exploited	630
Average occupancy rate / Year	15.2%
Average number of direct employments	246
Average number indirect employments	757

	2035 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (f = a x (r+1) ^{*21}) (*2)	144	144	144	144
Number of beds to be required (g)	839	839	839	839
Occupancy rate % (c + 5%)	17.2%	17.2%	17.2%	17.2%
Number of direct employments (b x 0.39)	327	327	327	327
Number of indirect employments (b x 1.2)	1,006	1,006	1,006	1,006

Total number of nights spent / Year	51,900
Average number of beds exploited	840
Average occupancy rate / Year	17.2%
Average number of direct employments	327
Average number indirect employments	1,006



(*1)The average nights spent per day in 2025 by implementing the strategy is targeted 15% more than those estimated with annual growth rate applied.
(*2)The average nights spent per day in 2035 by implementing the strategy is targeted 30% more than those estimated with annual growth rate applied.

(d) Gafsa-Tozeur

	2014 (Baseline)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (a)	952	749	651	760
Number of beds exploited (b)	4,879	4,890	4,919	4,919
Occupancy rate % (c = a/b)	19.5%	15.3%	13.2%	15.5%
Number of direct employments (b x 0.39)	1,903	1,907	1,918	1,918
Number of indirect employments (b x 1.2)	5,855	5,868	5,903	5,903

Source: ONTT

Total number of nights spent / Year	280,140
Average number of beds exploited	4,900
Average occupancy rate / Year	15.9%
Average number of direct employments	1,912
Average number indirect employments	5,882

Annual visitor exports (expenditure) growth rate 2014-2024 (r)	0.029
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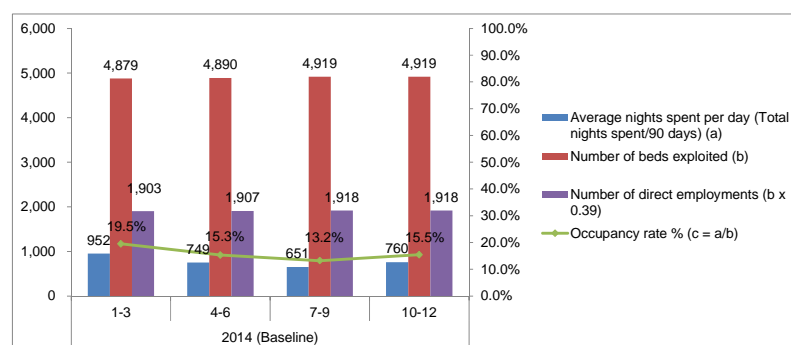
Source: WWTC Travel & Tourism Economic Impact 2014 TUNISIA

	2025 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (d = a x (r+1) ^{*11}) (*1)	1,499	1,180	1,026	1,197
Number of beds to be required (e)	6,660	6,440	6,316	6,488
Occupancy rate % (c + 3%)	22.5%	18.3%	16.2%	18.5%
Number of direct employments (b x 0.39)	2,597	2,512	2,463	2,530
Number of indirect employments (b x 1.2)	7,992	7,729	7,580	7,785

Total number of nights spent / Year	441,200
Average number of beds exploited	6,480
Average occupancy rate / Year	18.9%
Average number of direct employments	2,526
Average number indirect employments	7,771

	2035 (Target)			
	1-3	4-6	7-9	10-12
Average nights spent per day (Total nights spent/90 days) (f = a x (r+1) ^{*21}) (*2)	2,256	1,775	1,544	1,801
Number of beds to be required (g)	9,203	8,736	8,461	8,806
Occupancy rate % (c + 5%)	24.5%	20.3%	18.2%	20.5%
Number of direct employments (b x 0.39)	3,589	3,407	3,300	3,434
Number of indirect employments (b x 1.2)	11,043	10,483	10,154	10,567

Total number of nights spent / Year	663,800
Average number of beds exploited	8,800
Average occupancy rate / Year	20.9%
Average number of direct employments	3,433
Average number indirect employments	10,562



(*1)The average nights spent per day in 2025 by implementing the strategy is targeted 15% more than those estimated with annual growth rate applied.
(*2)The average nights spent per day in 2035 by implementing the strategy is targeted 30% more than those estimated with annual growth rate applied.

(e) **Kébili**

	2014 (Baseline)					
	1-3	4-6	7-9	10-12		
Average nights spent per day (Total nights spent/90 days) (a)	392	546	768	501	Total number of nights spent / Year	198,600
Number of beds exploited (b)	3,394	3,394	3,394	3,394	Average number of beds exploited	3,390
Occupancy rate % (c = a/b)	11.6%	16.1%	22.6%	14.7%	Average occupancy rate / Year	16.3%
Number of direct employments (b x 0.39)	1,324	1,324	1,324	1,324	Average number of direct employments	1,324
Number of indirect employments (b x 1.2)	4,073	4,073	4,073	4,073	Average number indirect employments	4,073

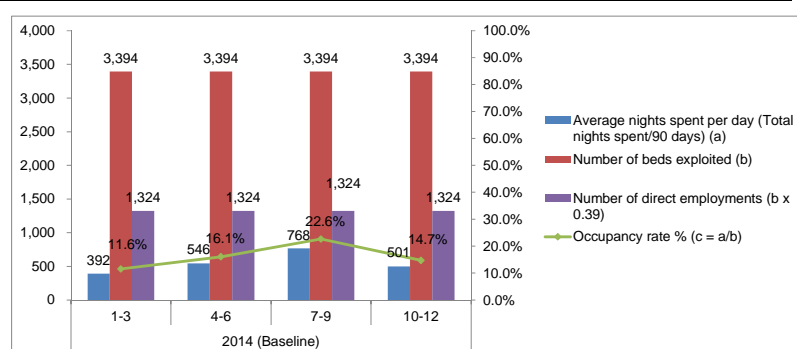
Source: ONTT

Annual visitor exports (expenditure) growth rate 2014-2024 (r)	0.029
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Source: WWTC Travel & Tourism Economic Impact 2014 TUNISIA

	2025 (Target)					
	1-3	4-6	7-9	10-12		
Average nights spent per day (Total nights spent/90 days) (d = a x (r+1)^11) (*1)	618	859	1,210	788	Total number of nights spent / Year	312,780
Number of beds to be required (e)	4,244	4,505	4,720	4,442	Average number of beds exploited	4,480
Occupancy rate % (c + 3%)	14.6%	19.1%	25.6%	17.7%	Average occupancy rate / Year	19.3%
Number of direct employments (b x 0.39)	1,655	1,757	1,841	1,732	Average number of direct employments	1,746
Number of indirect employments (b x 1.2)	5,092	5,406	5,664	5,330	Average number indirect employments	5,373

	2035 (Target)					
	1-3	4-6	7-9	10-12		
Average nights spent per day (Total nights spent/90 days) (f = a x (r+1)^21) (*2)	929	1,293	1,820	1,186	Total number of nights spent / Year	470,590
Number of beds to be required (g)	5,613	6,134	6,587	6,006	Average number of beds exploited	6,090
Occupancy rate % (c + 5%)	16.6%	21.1%	27.6%	19.7%	Average occupancy rate / Year	21.3%
Number of direct employments (b x 0.39)	2,189	2,392	2,569	2,342	Average number of direct employments	2,373
Number of indirect employments (b x 1.2)	6,736	7,361	7,905	7,207	Average number indirect employments	7,302



(*1)The average nights spent per day in 2025 by implementing the strategy is targeted 15% more than those estimated with annual growth rate applied.
(*2)The average nights spent per day in 2035 by implementing the strategy is targeted 30% more than those estimated with annual growth rate applied.

Source: JET

(4) **Approximate cost**

Necessary cost will be approximated by soft components, such as consultant services required for technical assistances (T/As) corresponding to the institutional and human capacity development plan, and hard components, such as construction costs required for the facilities and infrastructure development plan, each other.

(a) **Soft component**

The costs necessary for realizing soft components are mainly composed of the actions for establishing institutional framework, providing trainings to local people and promoting the proposed three destinations under the T/As provided by international and local consultants.

In order to approximate the cost for the soft components, following unit price for manning costs are set according to the recent JICA projects. It should be noted that direct costs, such as travel expenses, accommodations, transportation and equipment, are not included in the price.

Unit price: International consultant = 48,000 TND/men month

Local consultant = 16,000 TND/men month

Based on the unit price, approximate costs for soft components are detailed in Table 3.2-18:

Table 3.2-18 Approximate cost (Soft components)

Strategy	Plan	Unit price (TND/Men, Month)		Quantity (M/M)		Total (M TND)	Remarks
		International consultant	Local consultant	International consultant	Local consultant		
TM-1: Creation and promotion of destinations for all seasons in the southern region	TM-1-1: Establish the DMO	48,000	16,000	162	324	13.0	International consultant: 3 pers x 18 month x 3 Destinations
	TM-1-2: Establish destination contracts						Local consultant: 6 pers x 18 month x 3 Destinations
	TM-1-3: Promote the destinations to domestic and international markets	48,000	16,000	216	432	17.3	International consultant: 2 pers x 36 month x 3 Destinations Local consultant: 4 pers x 36 month x 3 Destinations
TM-2: Development of tourism services to meet with international standards	TM-2-2: Provide professional training courses for new tourism services	48,000	16,000	144	144	9.2	International consultant: 3 pers x 24 month x 2 Hotel schools (Djerba, Tozeur) Local consultant: 3 pers x 24 month x 2 Hotel schools
TM-3: Rehabilitation and conservation of material and immaterial heritages in the Southern region	TM-3-1: Conserve material heritages	48,000	16,000	324	648	25.9	International consultant: 3 pers x 36 month x 3 Destinations Local consultant: 6 pers x 36 month x 3 Destinations
	TM-3-2: Conserve immaterial heritages, such as artisans, music and dance	48,000	16,000	108	216	8.6	International consultant: 2 pers x 18 month x 3 Destinations Local consultant: 4 pers x 18 month x 3 Destinations
	TM-3-3: Register local heritages on the national and/or UNESCO's world heritage list	48,000	16,000	72	144	5.8	International consultant: 2 pers x 36 month x 1 site Local consultant: 4 pers x 36 month x 1 site
TM-4: Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society	TM-4-1: Establish the CBTO	48,000	16,000	324	648	25.9	International consultant: 3 pers x 36 month x 3 Destinations Local consultant: 6 pers x 36 month x 3 Destinations
	TM-4-2: Develop "Eco-museum"						
	TM-4-3: Provide necessary training for local people						
TM-5: Exploitation of agro-tourism by collaboration with agriculture sector	TM-5-1: Promote agro-tourism	48,000	16,000	216	432	17.3	International consultant: 2 pers x 36 month x 3 Destinations Local consultant: 4 pers x 36 month x 3 Destinations
	TM-5-2: Provide necessary training for the agro-tourism	48,000	16,000	144	144	9.2	International consultant: 3 pers x 24 month x 2 Hotel schools (Djerba, Tozeur) Local consultant: 3 pers x 24 month x 2 Hotel schools

Source: JET

(b) Hard component

Regarding the costs for hard components, the items are limited only the facilities related to the tourism sector, especially focused on the necessary public facilities for tourist sites, such as signboards, access road from rural road to the sites, public parking, public toilet, explanation panels and trail routes.

Approximate costs, including necessary materials and works, are detailed in Table 3.2-19:

Construction cost of rural road, sanitation services, electricity, etc. are not included in this chapter (see the chapter 3.5 hereinafter).

Table 3.2-19 Approximate cost (Hard components)

Strategy	Plan	Facility	Item	Unit	Unit price (TND)	Quantity	Sub-total (M TND)	Total (M TND)	Remarks
TM-3: Rehabilitation and conservation of material and immaterial heritages in the Southern region	TM-3-4: Create tourist circulation	Road side sign board	Sign board	No.	400	300	0.12	105.12	300 sign boards
		Access road	Asphalt pavement	km	700,000	150	105.00		1.0 km x 150 sites
	TM-3-5: Develop tourist sites	Public Parking	Asphalt pavement	m ²	60	90,000	5.40	139.36	600 m ² x 150 sites
		Public toilet	Building works	m ²	950	6,480	6.16		4.8 m x 9.0 m x H 4.5 m 150 sites
		Explanation panel	Panel	No.	400	4,500	1.80		30 panels x 150 sites
		Trail route	Stone pavement	m ²	120	1,050,000	126.00		3.5 m x 2,000 m x 150 sites

Source: JET

(5) Action plans

According to the tourism development strategies, necessary actions are detailed in the project sheets attached to the end of this chapter. Each project sheet defines the necessary actions, implementing (responsible) agency, relevant organizations and their roles. Target indicators for measuring expected impacts and risks (external conditions that the project cannot control) that may be constraints for implementation of actions are also identified in the sheet.

(6) Implementation schedule

Based on the Scenario 3, following figure indicates the road map during four phases, (i) Preparation, (ii) Formation, (iii) Execution and (iv) Expansion, by short-term (by the year 2020) and mid-term (by the year 2025), to develop the destinations as an effective cluster on the tourism sector in the region.

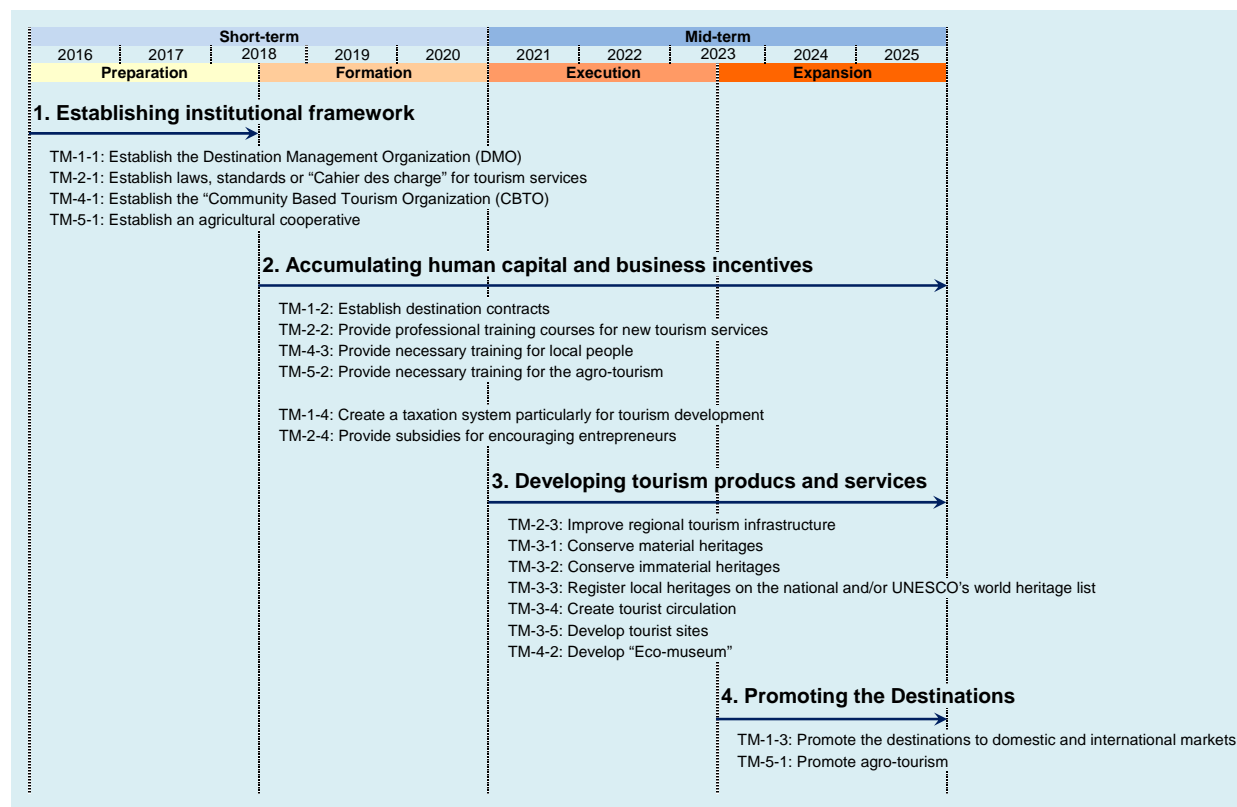


Figure 3.2-3 Road map for formulating the cluster on the Tourism sector

According to the road map, following table indicates implementation schedule of the action plans.

Table 3.2-20 Implementation Schedule of the Tourism Strategy and Action Plan

Code	Strategy	Implementation schedule			
		Short term		Mid term	
		Preparation	Formation	Execution	Expansion
		2015~	~2020	2021~	~2025
TM-1	Creation and promotion of destinations for all seasons in the Southern Region.	TM-1-1: Establish the DMO <ul style="list-style-type: none"> Establish the Destination Management Organization (DMO) in collaboration with relevant organization Define destinations in order to invite the tourist throughout the year 	TM-1-2: Establish destination contracts <ul style="list-style-type: none"> Establish destination contracts for five years (2020-2025) between relevant agencies TM-1-4: Create a taxation system particularly for tourism development <ul style="list-style-type: none"> Mobilize the state budget, particularly for the DMO Create a taxation system particularly 	TM-1-3: Promote the destinations to domestic and international markets <ul style="list-style-type: none"> Marketing in order to identify the tourists' demands and segmentations to be prioritized 	TM-1-3: Promote the destinations to domestic and international markets <ul style="list-style-type: none"> Create a web site for promoting the destinations Create advertisement materials for promoting the destinations Organize familiarization (FAM) tours in order to promote the destinations to

Code	Strategy	Implementation schedule			
		Short term		Mid term	
		Preparation	Formation	Execution	Expansion
		2015~	~2020	2021~	~2025
			for tourism development “Tourism Tax”		domestic and foreign travel agencies - Exhibit destinations’ information stands in international travel forums and expositions
TM-2	Development of tourism services to meet with international standards.	<p>TM-2-1: Establish laws, standards or “Cahier des charge” for tourism services</p> <ul style="list-style-type: none"> - Establish laws, standards or “Cahier des charge” for alternative tourisms, such as ecotourism, medical tourism and thermal tourism, in terms of hygiene and protection of natural environment - Re-establish hotel and restaurant classification system and re-classify them to meet with international standards - Establish an official license system for new tourism services 	<p>TM-2-2: Provide professional training courses for new tourism services</p> <ul style="list-style-type: none"> - Create professional training schools (public or private) - Recruit teachers to provide professional training for new tourism services - Provide professional training courses for new tourism services <p>TM-2-4: Mobilize the budget for improvement of tourism services</p> <ul style="list-style-type: none"> - Provide subsidies for encouraging entrepreneurs who respects laws, standards or “Cahier des charge” regarding quality of services - Mobilize the state budget, particularly for rehabilitation of public transport and construction of public facilities - Modify the tariff system for public transportation 	<p>TM-2-3: Improve regional tourism infrastructure</p> <ul style="list-style-type: none"> - Improve public transportation and infrastructure, and rehabilitate aging facilities - Provide adequate facilities in order for tourists to enjoy the destinations, such as accommodation and restaurants to meet with international standards - Construct public facilities for alternative tourisms, such as international medical centre for medical tourism and international convention centre for MICE tourism 	
TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern Region.		<p>TM-3-1: Conserve material heritages</p> <ul style="list-style-type: none"> - Select priority sites to be protected - Conduct an inventory survey of natural, archaeological and historical sites <p>TM-3-2: Conserve immaterial heritages, such as artisans, music and dance</p> <ul style="list-style-type: none"> - Conduct an inventory survey of immaterial heritages <p>TM-3-6: Mobilize budget for conservation of material and immaterial heritages</p> <ul style="list-style-type: none"> - Mobilize necessary budget for 	<p>TM-3-1: Conserve material heritages</p> <ul style="list-style-type: none"> - Establish management plan for natural, archaeological and historical site <p>TM-3-2: Conserve immaterial heritages, such as artisans, music and dance</p> <ul style="list-style-type: none"> - Assist professional training course and official certification to artisans <p>TM-3-3: Register local heritages on the national and/or UNESCO’s world heritage list</p> <ul style="list-style-type: none"> - Select candidate sites for registration of UNESCO’s world heritage and conduct an inventory survey - Define the limit and zone for conservation - Establish management plan - Prepare the application documents for registration <p>TM-3-4: Create tourist circulation</p> <ul style="list-style-type: none"> - Provide necessary transportation services for 	

Code	Strategy	Implementation schedule			
		Short term		Mid term	
		Preparation	Formation	Execution	Expansion
		2015~	~2020	2021~	~2025
			<p>conservation of material and immaterial heritages</p> <ul style="list-style-type: none"> - Revise entrance tariffs and ticketing systems for each site 	<p>tourists to travel within the region</p> <ul style="list-style-type: none"> - Furnish sign boards for tourists on the route - Improve access roads to sites <p>TM-3-5: Develop tourist sites</p> <ul style="list-style-type: none"> - Develop public facilities to facilitate or to control tourists - Develop public museums and archaeological sites <p>TM-3-6: Mobilize budget for conservation of material and immaterial heritages</p> <ul style="list-style-type: none"> - Provide subsidies to encourage local people who construct or rehabilitate private properties in protected areas in compliance with site management plan 	
TM-4	<p>Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society.</p>	<p>TM-4-1: Establish the CBTO</p> <ul style="list-style-type: none"> - Establish the "Community Based Tourism Organization (CBTO)" by collaborating with local people <p>TM-4-4: Establish laws, standards or "Cahier des charge" for tourism services</p> <ul style="list-style-type: none"> - Establish "Cahier des charge" for "Community Based Tourism (CBT)" - Limit "All inclusive" services provided by large scale hotels that prevents local economy from tourism development - Reconsider urban design dividing tourists from local markets 	<p>TM-4-3: Provide necessary training for local people</p> <ul style="list-style-type: none"> - To train local curators, mediators, official tour guides and park rangers for guiding around tourist sites - Provide seminars to the owners of local accommodations (Gite rural, Maison d'hote, etc.) and restaurants in order to promote the CBT with high quality services - Conduct awareness raising campaign to primary and secondary school students - Conduct clean-up campaigns in order to prevent pollution and to control solid waste on tourist sites supported by local people, such as civil societies, NGOs and students <p>TM-4-6: Mobilize the budget for the CBT</p> <ul style="list-style-type: none"> - Mobilize financial resources for small-scale projects provided by international cooperation agencies 	<p>TM-4-2: Develop "Eco-museum"</p> <ul style="list-style-type: none"> - Develop "Eco-museum" collaborating with local people <p>TM-4-5: Improve local tourism infrastructure</p> <ul style="list-style-type: none"> - Develop infrastructure that allow tourists to access rural areas, such as rural roads and transportation - Improve basic infrastructure and facilities to ensure the safety of tourists who travel in rural areas, such as water supply, wastewater treatment, telecommunication, internet <p>TM-4-6: Mobilize the budget for the CBT</p> <ul style="list-style-type: none"> - Provide a lending facility for small and medium sized entrepreneur 	
TM-5	<p>Exploitation of agro-tourism by collaboration with agriculture sector.</p>	<p>TM-5-1: Promote agro-tourism</p> <ul style="list-style-type: none"> - Establish an agricultural cooperative as a coordinating body for agro-tourism 	<p>TM-5-1: Promote agro-tourism</p> <ul style="list-style-type: none"> - Marketing appropriately in order to identify the tourists' demands 	<p>TM-5-1: Promote agro-tourism</p> <ul style="list-style-type: none"> - Exhibit local agricultural and artisanal products at international travel forums or exhibitions - Provide local specialties to tourists in collaboration with local farmers, hotels and 	

Code	Strategy	Implementation schedule			
		Short term		Mid term	
		Preparation	Formation	Execution	Expansion
		2015~	~2020	2021~	~2025
		<p>TM-5-3: Establish laws, standards or “Cahier des charge” for agro-tourism</p> <ul style="list-style-type: none"> - Modify the laws that prevent farmers having tourism on agricultural land 	<p>TM-5-2: Provide necessary training for the agro-tourism</p> <ul style="list-style-type: none"> - Provide necessary training to farmers to develop the agro-tourism - Introduce traditional agricultural technique to young farmers 	<p>restaurants</p> <p>TM-5-4: Develop facilities to improve access to the market</p> <ul style="list-style-type: none"> - Introduce a weekly farmers market inside “Tourist zone” for selling local products to tourists - Create a roadside commercial station or a regional antenna shop for selling local products <p>TM-5-5: Mobilize the budget for agro-tourism</p> <ul style="list-style-type: none"> - Mobilize financial resources for small scale projects provided by international cooperation agencies - Provide a lending facility for farmers 	

Source: JET

Sector	Strategy	TM-1	Creation and promotion of destinations for all seasons in the Southern Region		
	Plan		Actions	Term	Cost
Tourism	(a) Institutional and human capacity development plan	TM-1-1: Establish the DMO	<ul style="list-style-type: none"> - Establish the “Destination Management Organization (DMO)” in collaboration with relevant organization - Define destinations in order to invite the tourist throughout the year 	Short	13.0 M TND
		TM-1-2: Establish destination contracts	<ul style="list-style-type: none"> - Establish destination contracts for five years (2020-2025) between relevant agencies 		
		TM-1-3: Promote the destinations to domestic and international markets	<ul style="list-style-type: none"> - Marketing in order to identify the tourists’ demands and segmentations to be prioritized - Create a web site for promoting the destinations - Create advertisement materials for promoting the destinations - Organize familiarization (FAM) tours in order to promote the destinations to domestic and foreign travel agencies - Exhibit destinations’ information stands in international travel forums and expositions 	Mid	17.3 M TND
	(b) Facility and infrastructure development plan	—	—	—	—
	(c) Financial and investment plan	TM-1-4: Create a taxation system particularly for tourism development	<ul style="list-style-type: none"> - Mobilize the state budget, particularly for the DMO - Create a taxation system particularly for tourism development “Tourism Tax” 	Short - Mid	—

Strategy	TM-1	Creation and promotion of destinations for all seasons in the Southern Region			
Project	TM-1-1	Establish the DMO			
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	ODS, Ministry of Tourism and Handicrafts (MTA)		
Description					
To identify destinations is a critical issue for resolving problems of seasonality.					
Considering characteristic and potential of the tourism resources in the region, the below three destinations will be proposed.					
	Destination	Target Governorate	Orientation of Development	Main Product	Sub-products (Example)
1	Bleu - Méditerranée	Médenine, Gabès	“Relaxation” “Health” “Organic”	Vacation in the beautiful Mediterranean Sea	Sport tourism, Medical tourism, MISE tourism (*), Agro-tourism, Culture tourism
2	Terre - Berber	Gabès, Tataouine, Médenine	“Originality” “Tradition” “Authenticity”	Berber culture tourism	Thermal tourism, Agro-tourism
3	Rose - Sahara	Gafsa, Tozeur, Kébili, Tataouine	“Nature” “Peace” “Eternity”	Ecotourism in the Sahara and oases	Sport tourism, Mechanical tourism, Thermal tourism MISE tourism Culture tourism

Following figure shows proposed organization chart of the DMO. Direction of tourism is expected to be created in the ODS as the coordination body for three destinations.

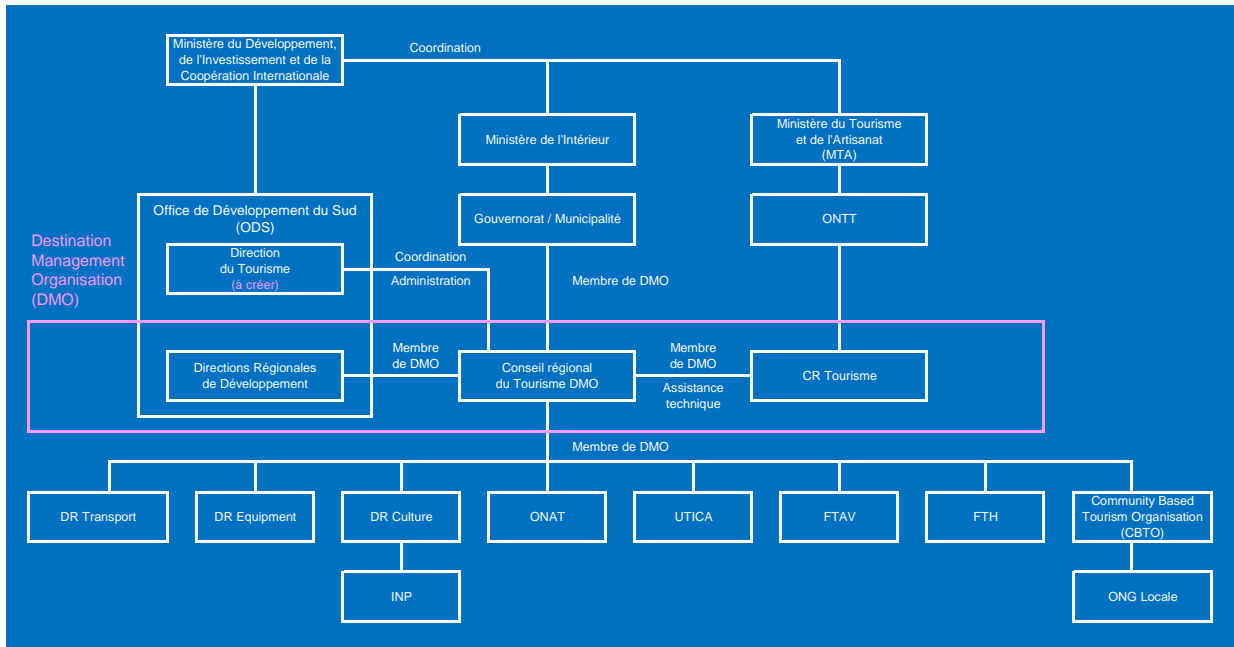


Figure: Organization chart of the DMO (Proposal)

Action Plan		
Actions	Relevant organizations	Role
- Establish the DMO	- ODS	- The ODS and the MTA initiate to establish a “Destination Management Organization (DMO)” for each destination in

	<ul style="list-style-type: none"> - Municipalities - Ministry of Tourism and Handicrafts (MTA) - ONTT and CR Tourism, - DR Transport - DR Equipment 	<p>collaboration with relevant organization.</p> <ul style="list-style-type: none"> - The DR Transport, DR Equipment, DR Culture, ONAT and INP have to be involved as a member of the DMOs who represents public sector. - The UTICA, FTAV, FTH and local NGOs also must be involved as a member of the DMOs who represents private sector related to the tourism development.
- Define destinations in order to invite the tourist throughout the year	<ul style="list-style-type: none"> - DR Culture - ONAT - INP (Institut National du Patrimoine) - UTICA - FTAV - FTH - Local NGOs < not limited > 	<ul style="list-style-type: none"> - The DMO has to <ul style="list-style-type: none"> · Complete a tourism inventory of a destination's tourism services including but not limited to accommodations, tour operators, attractions, and relevant logistics; · Set a "single" and "clear" vision for the destination; · Articulate long-term goals for sustainable tourism development.
Indicator	Risk	
<ul style="list-style-type: none"> - DMO for each destination will be established by the year 2020. - Destination contract for each destination will be established by the year 2020. 	Not identified	

Strategy	TM-1	Creation and promotion of destinations for all seasons in the Southern Region	
Project	TM-1-2	Establish destination contracts	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	ODS, Ministry of Tourism and Handicrafts (MTA)
Description			
<p>As an implementation framework to realize the strategy for “Destination”, the destination contract shall be set up with technical and financial support from the state, such as the ODS and the Ministry of Tourism and Handicrafts (MTA).</p> <p>The destination contract constitute innovative and highly operational tools to accelerate the international development of tourist destinations, to enhance the attractiveness of regions and to establish a framework for multi-year collaboration between public and private sector according to the common objectives in terms of tourism development and promotion.</p> <p>Identity, reputation and branding, geographical boundaries, administrative and collective organization, etc., can be considered to set a destination.</p> <p>A destination contract is a concrete response to the need to act together, to achieve a common goal of tourism development by sharing common visions, international brand and action plans for the relevant organizations.</p> <p>It unites actors to collaborate same orientation by using their own budget: notably those related to transport, accommodation, leisure and cultural activities, promotion, information, etc.</p> <p>The contract covers three or five years and it deals simultaneously with the structuring and development of the offer, the quality of services, promotion toward international markets, as well as business intelligence approaches.</p> <p>The signatories are members of the DMO, generally regional authorities, directly in charge of regional economic development, including private sector, such as tourist agencies (FTAV, FTH), Local NGOs and the actors of accommodation and transportation.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Establish destination contracts for five years (2020-2025) between relevant agencies	<ul style="list-style-type: none"> - ODS - Municipalities - MTA - ONTT and CR Tourism, - DR Transport - DR Equipment - DR Culture - ONAT - INP (Institut National du Patrimoine) - UTICA - FTAV - FTH - Local NGOs < not limited > 	<ul style="list-style-type: none"> - The ODS and the MTA will develop the condition and/or terms of references of the destination contract. - Every member of the DMO establishes an agreement, destination contract, under which each member will contribute, collaborate and implement projects to promote the destination by sharing same vision and goals. 	
Indicator		Risk	
- Each destination will establish a destination contract by the year 2020.		Not identified	

Strategy	TM-1	Creation and promotion of destinations for all seasons in the Southern Region	
Project	TM-1-3	Promote the destinations to domestic and international markets	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	DMOs

Description

The strategy aims to have the following direct and/or indirect effect on the local economy and for social and environmental sustainability:

- 1) Improvement of revenue from tourism, especially in the low season;
- 2) Improvement of the situation of seasonal employment;
- 3) Improvement of social stability by providing permanent jobs.

In order to achieve above objectives, promotion of the destinations to invite more tourist from domestic and international markets to the region is essential.

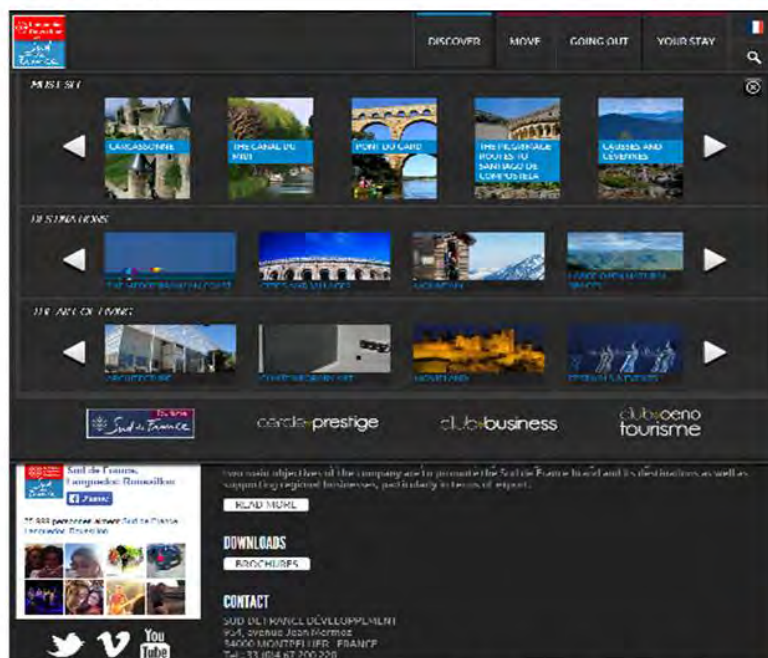
The strategy especially focused on promotion through 1) Marketing, 2) Multimedia advertisement, and 3) Exhibitions toward international tourism market.

Following example represents multimedia advertisement for promoting a destination in France:



Logo Design

Brochure



Web site, linked to "Twitter", "You Tube" and "Face Book"



Tourist Map

Source: Destination Sud de France (<http://www.destinationsuddefrance.com/>)

Action Plan		
Actions	Relevant organizations	Role
- Marketing and auditing in order to identify the tourists' demands and segmentations	- DMO - MTA - ONTT and CR Tourism - FTAV - FTH	- The DMO, in collaboration with the MTA, has to conduct baseline marketing survey and audit the trends of tourist/visitor, for example: <ul style="list-style-type: none"> • Which types of people visit the destination? • How long they stay? • What they do? • How much they spend? • How they found out about the destination? , etc.
- Create a web site for promoting the destinations		- The DMO, in collaboration with the MTA, creates a web site as a Destination Management System (DMS) for providing entire information of destination.
- Create advertisement materials for promoting the destinations		- The DMO, in collaboration with ONTT and CR Tourism, creates advertisement materials for promoting the destinations, with attractive logos, catch-phrases, etc.
- Organize a press or familiarization (FAM) trip		- The DMO, in collaboration with ONTT, CR Tourism, FTAV and FTH, organizes a press/FAM trip in order to promote the destinations to domestic and foreign travel agencies.
- Exhibit destinations' information stands in international travel forums and expositions		- The DMO, in collaboration with ONTT, CR Tourism, FTAV and FTH, exhibits destinations' information stands in international travel forums and expositions.
Indicator		Risk
<ul style="list-style-type: none"> - Total number of nights spent in the region will increase from 7.8 million nights in 2014 to 10.8 million in 2025 and 14.5 million in 2035. - Total number of beds exploited (annual average) in the region will increase from 47,810 in 2014 to 61,800 in 2025 and 80,140 in 2035. - Hotel occupancy rate (annual average) in the region will increase from 44.5 % in 2014 to 47.5 % in 2025 and 49.5 % in 2035. - The number of direct employments in the region will increase from 18,640 in 2014 to 24,100 in 2025 and 31,250 in 2035. (See Table 3.2-16)		<ul style="list-style-type: none"> - Future inbound tourism will be mostly influenced by the political stability and security condition in Tunisia. - Currency rate will also affect future inbound tourism deeply.

Strategy	TM-1	Creation and promotion of destinations for all seasons in the Southern Region	
Project	TM-1-4	Create a taxation system particularly for tourism development	
Intervention Area	—	Implementing agency	ONTT
Description			
<p>The concept of the DMO is non-profit organization that each DMO member will take responsibility to realize the task by his own budget under the destination contract. However, to mobilize state budget for common activities under the DMO, such as administration cost and meeting cost, is also required to strengthen the organization.</p> <p>New taxation system “Tourism tax”, especially using for regional/local tourism development is also proposed as a financial resource for the activities by the DMO. Normally, the tourism tax will be applicable to both national and international visitors corresponding to one’s number of nights spent in the region per room or per person. Applying the tourism tax is widely understood all over the world that tourists have to pay the cost to consume or use regional resources by taking his responsibility. The tourism tax will also be used to maintain and enhance the touristic infrastructure.</p> <p>On the other hand, considering current situation that there are large differences of number of hotels and number of visitors between coastal areas and inland areas, collection and application system of the “Tourism tax” must be well examined. Following figure presents an example of taxation system applied in Paris (Year 2015) :</p>			
TARIFS PAR PERSONNE ET PAR NUITEE			
MEUBLES DE TOURISME			TARIFS 2015
Hôtels ****			1,20 €
Hôtels ***			1,00 €
Hôtels **			0,90 €
Hôtels *			0,75 €
Hôtels NC	+10 % conseil général		0,44 €
Résidences de Tourisme ****			1,20 €
Résidences de Tourisme ***			1,00 €
CCAS, Résidence, Village de vacances	Equivalence 2*		0,90 €
Meublés classés 4 *			1,20 €
Meublés classés 3 *			1,00 €
Meublés classés 2*			0,90 €
Meublés classés 1*			0,75 €
Meublés NC Catégorie Luxe	Equivalence 4*		1,20 €
Meublés NC Catégorie Confortable	Equivalence 3*		1,00 €
Chambres d’Hôtes	Equivalence 1*		0,75 €
Camping ****	+10 % conseil général		0,60 €


Figure: Tourist tax in Paris

Action Plan		
Actions	Relevant organizations	Role
– Mobilize state budget, especially for the DMO	– DMO – ODS – MTA – ONTT and CR Tourism	– The DMO, in collaboration with the ODS, has to find some partners/donors who assist the DMOs technically and financially. – The DMO, in collaboration with the ODS and the MTA, has to manage the budget required for the common activities under the DMOs: <ul style="list-style-type: none"> • Prepare annual budget plan; • Mobilize state budget; • Manage the annual budget; • Audit the annual budget.
– Create a taxation system “Tourism tax”, especially for regional/local tourism development	– MTA – Ministry of Finance	– The MTA, in collaboration with the Ministry of Finance, creates a taxation system “Tourism tax”, especially using for regional/local tourism development.
Indicator		Risk
– A system of the “Tourism tax” will be established by the year 2020.		Not identified

Sector	Strategy	TM-2	Development of tourism services to meet with international standards		
			Plan	Actions	Term
Tourism	(a) Institutional and human capacity development plan	TM-2-1: Establish laws, standards or “Cahier des charge” for tourism services	<ul style="list-style-type: none"> - Establish laws, standards or “Cahier des charge” for alternative tourisms, such as ecotourism, medical tourism and thermal tourism, in terms of hygiene and protection of natural environment - Re-establish hotel and restaurant classification system and re-classify them to meet with international standards - Establish an official license system for new tourism services 	Short	—
			<ul style="list-style-type: none"> - Create professional training schools (public or private) - Recruit teachers to provide professional training for new tourism services - Provide professional training courses for new tourism services 	Mid	9.2 M TND
	(b) Facility and infrastructure development plan	TM-2-3: Improve regional tourism infrastructure	<ul style="list-style-type: none"> - Improve public transportation and infrastructure, and rehabilitate aging facilities - Provide adequate facilities in order for tourists to enjoy the destinations, such as accommodation and restaurants to meet with international standards - Construct public facilities for alternative tourisms, such as international medical centre for medical tourism and international convention centre for MICE tourism 	Short - Mid	—
(c) Financial and investment plan	TM-2-4: Mobilize the budget for improvement of tourism services	<ul style="list-style-type: none"> - Provide subsidies for encouraging entrepreneurs who respects laws, standards or “Cahier des charge” regarding quality of services - Mobilize the state budget, particularly for rehabilitation of public transport and construction of public facilities - Modify the tariff system for public transportation 	Short - Mid	—	

Strategy	TM-2	Development of tourism services to meet with international standards	
Project	TM-2-1	Establish laws, standards or “Cahier des charge” for tourism services	
Intervention Area	—	Implementing agency	MTA
Description			
<p>According to the results of the tourism survey conducted during the diagnostic phase of the JICA survey, the main constraints in the region are mostly related to the quality of services or diversity of services.</p> <p>On the other hand, regarding the quality of accommodation and restaurants, some standards are already established in Tunisia; however, quality of services is sometimes quite different from each establishment with same ranking.</p> <p>Therefore, improvement of the quality of services meeting with the higher-end tourists or personalization of the services to specific segmentations will be the key interventions in order to develop the tourism sector in Tunisia.</p> <p>In addition, protect the natural environment from an increase of tourists is an essential issue to ensure the sustainability of tourism development.</p> <p>Particularly, waste management and water resource management are necessary to protect the environment.</p>			
Action Plan			
Actions	Relevant organizations	Role	
– Re-establish hotel and restaurant classification system and re-classify facilities to meet with international standards	– MTA – ONTT, CR Tourism	<p>– The MTA re-establishes hotel and restaurant classification system and re-classifies existing facilities to meet with new standards.</p> <p>– The ONTT and CR Tourism will enforce the laws and control the quality by regular inspection.</p> <p>– The FTH will respect new standards and enforce it to the membership hotels.</p>	
– Establish an official license system for new tourism services	– MTA – ONTT, CR Tourism – FTAV – FTH	<p>– The MTA establishes an official license system for new tourism services, such as park rangers for ecotourism, therapists for thalassotherapy, interpretation services for international conference, and sommeliers for high-end restaurants.</p> <p>– The ONTT and CR Tourism will enforce the laws and control the quality by regular inspection.</p> <p>– The FTH and FTAV will respect new standards and enforce it to the members.</p>	
– Establish laws, standards or “Cahier des charge” for alternative tourisms, such as ecotourism, medical tourism and thermal tourism, in terms of hygiene and protection of natural environment	– MTA – Ministry of Health – Agence nationale de gestion des déchets (ANGed) – SONEDE – ONTT, CR Tourism	<p>– The MTA establishes laws, standards or “Cahier des charge” for alternative tourisms, such as ecotourism and mechanical tourism, in terms of protection of natural environment.</p> <p>– The Ministry of Health establishes laws, standards or “Cahier des charge” for alternative tourisms, such as medical tourism and thermal tourism, in terms of hygiene.</p> <p>– The MTA, SONEDE, ONAS and ANGed establish a “Cahier des charge” for specific activities by private sector that may produce significant impacts on the natural environment, such as hotels and golfs, in order to manage the waste (solid/liquid) and water resources, in terms of protection of natural environment.</p>	

		- The ONTT and CR Tourism will enforce the laws by regular inspection.
Indicator		Risk
- New hotel standards will be established by the year 2020.		- The rank of hotel and restaurant classification directly influence on their sales. Thus, when establish new standards and apply it to existing hotels and restaurants, it is necessary to conduct a public consultation including owners prior to re-classification. - Improvement of accommodation and restaurants depends on the private investment.

Strategy	TM-2	Development of tourism services to meet with international standards		
Project	TM-2-2	Provide professional training courses for new tourism services		
Intervention Area	—	Implementing agency	ONTT	
Description				
<p>When we improve the quality of services, human resource development is also required.</p> <p>In particular, to meet with new tourism services, park rangers for ecotourism, therapists for thalassotherapy, interpretation services for international conferences and sommeliers for high-end restaurants are required and provision of official training and a licensing system are necessary for ensuring the quality of services.</p>		 <p style="text-align: center;">ONTT hotel school (Djerba)</p>		
Action Plan				
Actions	Relevant organizations		Role	
– Create professional training schools (public or private)	<ul style="list-style-type: none"> – ONTT – Ministry of Culture – Ministry of Agriculture – Ministry of Public Health 		<ul style="list-style-type: none"> – The ONTT, collaborating with the Ministry of Culture, Ministry of Agriculture and Ministry of Health initiates to establish professional training schools for alternative tourisms, such as ecotourism, culture tourism, medical tourism or thermal tourism. 	
– Recruit teachers to provide professional training for new tourism services	<ul style="list-style-type: none"> – ONTT – Ministry of Culture – Ministry of Agriculture – Ministry of Public Health 		<ul style="list-style-type: none"> – The ONTT, collaborating with the Ministry of Culture, Ministry of Agriculture and Ministry of Health initiates to recruit teachers to provide professional training for new tourism services, park rangers for ecotourism, therapists for thalassotherapy of medical tourism. 	
– Provide professional training courses for new tourism services	<ul style="list-style-type: none"> – ONTT – Ministry of Culture – Ministry of Agriculture – Ministry of Public Health 		<ul style="list-style-type: none"> – The ONTT, collaborating with the Ministry of Culture, Ministry of Agriculture and Ministry of Health initiates to establish professional training courses for new tourism services. 	
Indicator			Risk	
– All of the professional workers will obtain official licenses by the year 2025.			– Coordination and cooperation with different ministries are required.	

Strategy	TM-2	Development of tourism services to meet with international standards	
Project	TM-2-3	Improve tourism infrastructure	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Relevant Ministries
Description			
<p>Though many important Berber villages and Ksour are located in the area, many sections are still non-paved road and it is difficult to access sites. There are limited public transportation services for individual tourists and their quality is not suitable for tourists in terms of comfort and frequency.</p> <p>Sanitation, electricity and telecommunication networks are essential infrastructure for ensuring tourism development. Solid waste management is also important for sustainable tourism development from the viewpoint of environment.</p> <p>In terms of the tourism development at inland areas, following infrastructures are most likely to promote positive impact to the region.</p>			
Table: Infrastructure for tourism development			
NO.	Project	Governorate	Description
A. Highway			
1	Extension of highway, Médenine – Djerba international airport	Médenine	Improve connection between Tunisia's best tourist site Djerba and other regions.
2	Extension of highway, Sfax – Gafsa – Tozeur	Gafsa	Highway between Sfax and Tozeur can promote positive impact to the economy in Southwest by promoting dynamic economic activities in terms of logistic and tourism.
B. Bridge			
3	Construction of new bridge, Bac Ajim – Jorf	Médenine	Highway bridge between Bac Ajim and Jorf can promote positive impact to the economy in inland area, for example Sidi Makhlouf, by promoting dynamic economic activities in terms of logistic and tourism.
C. Rural road			
4	Béni Khédache – Tataouine	Médenine	Improve connection to inland tourist zone.
5	Zarzis – Tataouine	Médenine	Improve connection to inland tourist zone.
6	Médenine – Ksar Hallouf – Ksar Ghilane	Médenine	Improve connection to inland tourist zone.
7	Médenine – Béni Khédache – Ksar Ghilane	Médenine	Improve connection to inland tourist zone.
8	Béni Khédache	Médenine	Improve tourist circulation around Béni Khédache to visit Ksar Hallouf, Ksar Khrachfa, Ksar Ouled Mehdi, etc.
9	Médenine – Mareth – Matmata	Gabès	Improve connection to inland tourist zone.
10	Médenine – Toujane – Matmata	Gabès	Improve connection to inland tourist zone.
11	Matmata	Gabès	Improve tourist circulation around Matmata to visit Beni Zelten, Tamezlet, Zeraoua, etc.
12	Tataouine – Ksar Ghilane	Tataouine	Improve connection to inland tourist zone.
13	Tataouine	Tataouine	Improve tourist circulation around Tataouine to visit Ksar Ouled Sultane, Ksar Hadada, Guermezza, Chenini, Douiret, etc.
14	Tozeur	Tozeur	Improve tourist circulation around Tozeur to visit Ong el Jemel, Chebika, Tamerza, etc.
D. Public Utilities			
15	Construction of exposition park and international convention centre	Médenine, Tozeur	Create International convention centre at Sidi Makhlouf and Nefta.
16	Construction of international medical centre	Médenine, Gabès	Create International medical centre associated with Geo-thermal or Thalassotherapy at El hamma and Djerba.
17	Development of ONTT training centre	Médenine, Tozeur	Upgrade ONTT's professional training centres.

Source: JICA study team





Figure: Initial tourist circulations

Action Plan		
Actions	Relevant organizations	Role
<ul style="list-style-type: none"> – Improve public transportation and infrastructure, and rehabilitate aging facilities 	<ul style="list-style-type: none"> – Municipalities – Ministry of Equipment – Ministry of Transport – SONEDE – ONAS < Not limited > 	<ul style="list-style-type: none"> – Municipalities, in collaboration with the Ministry of Equipment, Ministry of Transport SONEDE, ONAS and relevant agencies improve basic infrastructure, such as telecommunication and sanitation networks, especially in the rural area. – The Ministry of Equipment and Ministry of Transport rehabilitate aging facilities, especially public transportation and infrastructure provided for tourist.
<ul style="list-style-type: none"> – Provide adequate facilities in order for tourists to enjoy the destinations, such as accommodation and restaurants to meet with international standards 	<ul style="list-style-type: none"> – MTA – ONTT, CR Tourism – FTH 	<ul style="list-style-type: none"> – The MTA re-establishes hotel and restaurant classification system and re-classifies existing facilities to meet with new standards. – The ONTT and CR Tourism will enforce the laws and control the quality by regular inspection.
<ul style="list-style-type: none"> – Construct public facilities for alternative tourisms 	<ul style="list-style-type: none"> – Municipalities – MTA – AFT (Agence Foncière Touristique) – Ministry of Equipment – Ministry of Industry – Ministry of Health 	<ul style="list-style-type: none"> – Municipalities, in collaboration with the MTA, Ministry of Equipment, Ministry of Industry and Ministry of Health has to develop necessary public facilities for alternative tourisms, such as international medical centre for medical tourism and international convention centre for MICE tourism. – The AFT manages and develops necessary land acquisition and installation of infrastructures.
Indicator		Risk
<ul style="list-style-type: none"> – All of the accommodations in rural area can access basic infrastructure by the year 2025. 		<ul style="list-style-type: none"> – Improvement of accommodation and restaurants depends on the private investment.

Strategy	TM-2	Development of tourism services to meet with international standards		
Project	TM-2-4	Mobilize the budget for improvement of tourism services		
Intervention Area	—	Implementing agency	Relevant Ministries	
Description				
<p>Improvement of accommodation and restaurants are initiated by private sector.</p> <p>However, existing financial incentives provided for the tourism sector are not fully appropriate. Development of new types of tourism (ecotourism, cultural tourism, etc.) initiated by local populations will be subject to financial and banking scheme created especially for small and medium-sized enterprises (SMEs).</p> <p>For example, the STB-SICAR provides credit for SMEs, however, the maximum amount of investment by the STB-SICAR cannot exceed 10 % of the total project cost or 49 % of the company's capital, and the average investment period shall not exceed seven years, despite tourism projects taking more time to appear profitable.</p> <p>Providing subsidies for encouraging entrepreneurs who respect law, standards or "Cahier des charge" is one of incentives to improve the quality of services provided by private sector.</p> <p>On the other hand, upgrading basic infrastructure almost depends on mobilization of the state budget handled by relevant ministries.</p> <p>In order to improve public transportation services, modification of existing tariff system has also to be considered in terms of sales generation.</p>				
Action Plan				
Actions	Relevant organizations		Role	
– Provide subsidies for encouraging entrepreneurs who respects laws, standards or "Cahier des charge" regarding quality of services	– MTA		– The MTA create and manage a subsidy system for encouraging entrepreneurs who respects laws, standards or "Cahier des charge" regarding quality of services by using revenue from "Tourism tax".	
– Mobilize the state budget, particularly for rehabilitation of public transport and construction of public facilities	– Ministry of Equipment – Ministry of Transport – SONEDE – ONAS < Not limited >		– The Ministry of Equipment and Ministry of Transport and relevant agencies mobilize the state budget, particularly for rehabilitation of public transport and construction of public facilities.	
– Modify existing tariff system for public transportation	– Ministry of Transport		– The Ministry of Transport modify existing tariff system for public transportation in order to mobilize necessary budget for improving the quality of services, for example replacement of aged public transportation vehicles, etc.	
Indicator			Risk	
– A subsidy system for encouraging entrepreneurs who provide tourist services will be created by the year 2020.			Not identified	

Sector	Strategy	TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern region			
			Plan	Actions	Term	Cost
Tourism	(a) Institutional and human capacity development plan	TM-3-1: Conserve material heritages	<ul style="list-style-type: none"> - Select priority sites to be protected - Conduct an inventory survey of natural, archaeological and historical sites - Establish management plan for natural, archaeological and historical site 	Short	25.9 M TND	
		TM-3-2: Conserve immaterial heritages, such as artisans, music and dance	<ul style="list-style-type: none"> - Conduct an inventory survey of immaterial heritages - Assist professional training course and official certification to artisans 	Short	8.6 M TND	
		TM-3-3: Register local heritages on the national and/or UNESCO's world heritage list	<ul style="list-style-type: none"> - Select candidate sites for registration of UNESCO's world heritage and conduct an inventory survey - Define the limit and zone for conservation - Establish management plan - Prepare the application documents for registration 	Mid	5.8 M TND	
	(b) Facility and infrastructure development plan	TM-3-4: Create tourist circulation	<ul style="list-style-type: none"> - Provide necessary transportation services for tourists to travel within the region - Furnish sign boards for tourists on the route - Improve access roads to sites 	Short	105.12 M TND	
		TM-3-5: Develop tourist sites	<ul style="list-style-type: none"> - Develop public facilities to facilitate or to control tourists - Develop public museums and archaeological sites 	Short - Mid	139.36 M TND	
	(c) Financial and investment plan	TM-3-6: Mobilize budget for conservation of material and immaterial heritages	<ul style="list-style-type: none"> - Mobilize necessary budget for conservation of material and immaterial heritages - Provide subsidies to encourage local people who construct or rehabilitate private properties in protected areas in compliance with site management plan - Revise entrance tariffs and ticketing systems for each site 	Short - Mid	—	

Strategy	TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern region	
Project	TM-3-1	Conserve material heritages	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Ministry of Culture and INP
Description			
<p>Unfortunately, while cultural and natural heritages located in inland areas have a great potential of tourism, such as Ksour and mountain villages in Tataouine, cave dwelling in Matmata, roman ruins in Medenine and the Sahara, that has not been well managed and exploited until today.</p> <p>However, tourism for visiting these prominent cultural and natural resources will be a motif of destination that can be a solution against the problems of seasonality and unemployment. Because this type of tourism is possible through the year and more preferable during autumn and winter season in order to avoid high temperatures during summer.</p> <p>On the other hand, once the value of local cultural and natural heritage has disappeared, the region will lose not only their tourism resources, but also lose the tourists that the regional economy depends on.</p> <p>Thus, how to conserve the heritages is an urgent issue, in terms of sustainable tourism development.</p>			
			
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Cave dwelling (Haddej)</p> </div> <div style="text-align: center;"> <p>Meninx (Djerba)</p> </div> <div style="text-align: center;"> <p>Traditional house (Tozeur Médina)</p> </div> </div>			
Action Plan			
Actions	Relevant organizations		Role
- Select priority sites to be protected	- Ministry of Culture - INP - DMO		- The Ministry of Culture, in collaboration with the INP and the DMO, identifies the priority sites to be protected.
- Conduct an inventory survey of natural, archaeological and historical sites			- The Ministry of Culture, in collaboration with the INP, conducts scientific research to identify the sites including information of overview of its history and development.
- Establish management plan for natural, archaeological and historical site			- The Ministry of Culture, in collaboration with the INP, establishes a site management plan for each priority site to ensure the effective protection of the sites and monitoring plan.
Indicator			Risk
- Priority sites will be selected and a management plan for each site will be established by the year 2020.			- Without control the number of tourists, mass tourism sometimes destroy not only local tourism resources but also local traditions and way of life.

Strategy	TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern region	
Project	TM-3-2	Conserve immaterial heritages, such as artisans, music and dance	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Ministry of Culture
Description			
<p>Cultural heritage does not end at monuments and collections of objects. It also includes traditions or living expressions inherited from our ancestors and passed on to our descendants, such as oral traditions, performing arts, social practices, rituals, festive events, knowledge and practices concerning nature and the universe or the knowledge and skills to produce traditional handicrafts. UNESCO has also established intangible cultural heritage list since 2003.</p> <p>For example, in the case of Morocco, Argan, practices and know-how concerning the argan tree (2014), Cherry festival in Sefrou (2012), Cultural space of Jemaa el-Fna Square (2008), and Moussem of Tan-Tan (2008) are listed on UNESCO's intangible cultural heritage list.</p> <p>(a) Music and dance</p> <p>The region has rich tribal and traditional music and dances associated with the Saharan culture.</p> <p>(b) Handicrafts</p> <p>Handicraft sector is in close association with tourism sector. The region has many handicraft products with rich historical and tribal backgrounds.</p> <p>(c) Gastronomy</p> <p>Local cuisine must be taken in account as one of local heritages.</p>			
			
Action Plan			
Actions	Relevant organizations	Role	
- Conduct an inventory survey of immaterial heritages.	- Ministry of Culture - ONTT - ONAT - DMO	- The Ministry of Culture, collaborating with the ONTT, ONAT and DMO, conduct an inventory survey of immaterial heritages.	
- Assist professional training course and official certification to artisans.	- ONTT	- The ONAT has to provide professional training course and official certification to artisans.	
Indicator		Risk	
- ONAT will establish official license system for artisans by the year 2025.		Not identified	

Strategy	TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern region	
Project	TM-3-3	Register local heritages on the national and/or UNESCO's world heritage list	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Ministry of Culture and INP

Description

Now, the UNESCO's world heritage is well known as one of the engine to promote the sites toward the worldwide tourism market, particularly in terms of development of culture tourism. On the other hand, in order to register on the heritage list, a site management system will be required for conserving the value of the site, including how to control the number of tourists.

According to the definition of the UNESCO's world heritage and considering its criteria, following sites could be registered on the world heritage list considering its universal value.

NO.	Candidate site	Governorate	Description
E. Cultural heritage			
1	Gightis	Médenine	Roman ruin of the 1 st century, the site represents typical roman town associated with the Mediterranean sea.
2	Cave dwelling in Matmata	Gabès	Traditional Berber village in the mountain area characterized its underground cave dwelling.
3	Phosphate Railway	Gafsa	Railway between Métaoui – Selja valley that exports phosphate represents outstanding industrial heritage of French colonial age since early 20 th century. Now, the train "Léopard rouge" takes the tourist to the historical and scenic valley of ancient phosphate mine.
F. Cultural landscape			
4	Cultural land scape of Berber village	Tataouine, Médenine	The grand canyon, mountain villages, traditional irrigation system "Jessour" and collective granary "Ksar" compose outstanding landscape that represents universal value of the Berber culture.
5	Oasis of Tozeur and old Médina of Ouled el HadeF	Tozeur	Historical oasis of 1,400 ha still conserves traditional irrigation system developed in Arabic countries. The old médina of Tozeur also exposes outstanding architecture characterized by brick decorated building with geometric pattern.
6	Oasis of Gabès	Gabès	World unique coastal oasis. The oasis is in danger due to reinforced concrete facilities, unlimited urbanization and loss of farmers.

Source: JICA study team



1. Gightis



2. Cave dwelling in Matmata



3. Phosphate Railway







4. Ksar Ouled Sultane



5. Old Médina of Ouled el HadeF



6. Oasis of Gabès

Action Plan		
Actions	Relevant organizations	Role
- Select candidate sites for registration of UNESCO's world heritage and conduct an inventory survey	- Ministry of Culture - INP - DMO	- The Ministry of Culture, in collaboration with the INP, conducts scientific research to identify the sites including information of overview of its history and development.
- Define the limit and zone for conservation	- Ministry of Culture - INP - Ministry of Equipment - Ministry of Agriculture	- The INP defines boundaries of the site and buffer zone for conservation. - The INP, in collaboration with the Ministry of Equipment and Ministry of Agriculture, defines legal condition of the buffer zone, such as land use and new construction.
- Establish management plan	- Ministry of Culture - INP - DMO	- The Ministry of Culture, in collaboration with the INP, establishes management system to ensure the effective protection of the sites, including site management plan and monitoring plan.
- Prepare the application documents for registration	- Ministry of Culture - INP	- The Ministry of Culture, in collaboration with the INP, prepares an application documents for registration on the UNESCO's world heritage list.
Indicator	Risk	
- Minimally, one site will be registered on the UNESCO's world heritage list by the year 2025.	<p>- Many sites, such as Ksar and traditional irrigation system in the oasis, are suffering inappropriate restauration/transformation that prevents the possibility of registration on the heritage list, in terms of the loss of authenticity.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Traditional canal before renovation (1990's) (Oasis of Tozeur)</p> </div> <div style="text-align: center;">  <p>After renovation at same place (Oasis of Tozeur)</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Ksar restored of concrete (Tataouine)</p> </div> <div style="text-align: center;">  <p>Concrete irrigation system (Oasis of Gabès)</p> </div> </div>	

Strategy	TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern region		
Project	TM-3-4	Create tourist circulation		
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	DMOs	

Description

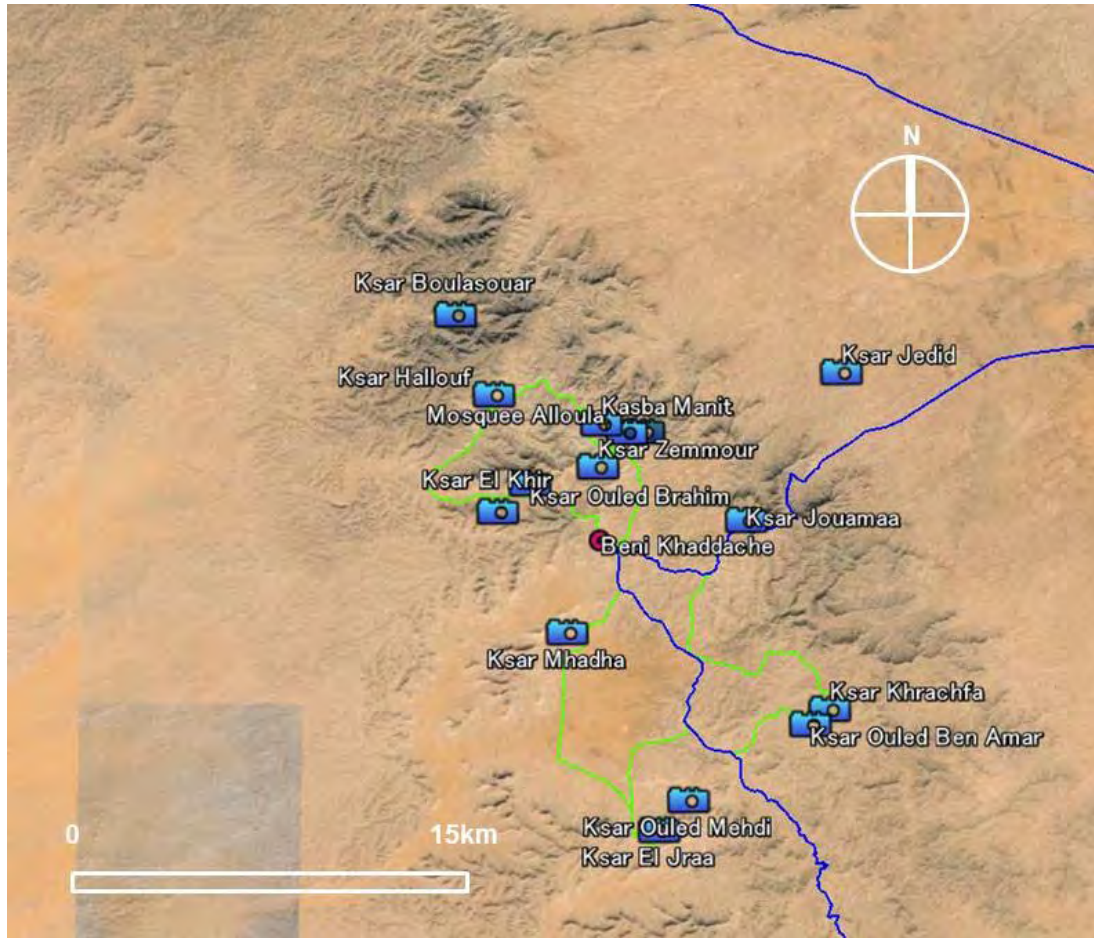
Most of the towns located in inland area, in spite of having rich tourism resources, are recognized only as one of the city along the passage route. Moreover, tourists stay few hours or only take lunch there, and consequently tourism does not benefit local economy enough.

As a measure to improve above situation, providing various tourist circulations could increase number of nights spent in same area. A tourist circulation consist of 1) Theme, 2) Core city, 3) Discover route, and 4) Sites.

Following examples show tourism circulations where tourists can discover traditional Berber culture in the region of Tataouine, Beni Khédach and Matmata:



1) Theme		Berber Culture		
2) Core City		Tataouine		
3) Discover route		Distance (km)	Time required	4) Sites
1	North route	66 km	1/2 – 1 day	Ksar Mrabtine → Ksar Bayouli → Ksar Hadada → Ghomrassen → GuerMESSA
2	West route	55 km	1/2 day	Chenini → Douiret
3	South route	53 km	1/2 – 1 day	Beni Barka → Ksar Tounekt → Ksar Khadim → Ksar Ouled Sultane → Ksar Ezzahra → Ksar Gattoufa





1) Theme	Berber Culture		
2) Core City	Beni Khédach		
3) Discover route	Distance (km)	Time required	4) Sites
1 North route	25 km	1/2 day	Ksar Zemmour → Mosquee Alloula → Kasba Manit → Ksar Hallouf → Oasis Hallouf → Ksar El Khir
2 South route	42 km	1/2 day	Ksar Mhadha → Ksar Ouled Mehdi → Ksar Khrachfa → Ksar Jouamaa



1) Theme	Berber Culture		
2) Core City	Matmata		
3) Discover route	Distance (km)	Time required	4) Sites
1 West-East route	48 km	1 day	Matmata → Tamezret → Zeraoua → Haddej → Beni Zelten → Toujane

Source: JICA study team

Action Plan		
Actions	Relevant organizations	Role
- Define tourist circulation	- DMO - ONTT, CR Tourism	- The DMO define a 1) Theme for tourist circulation. - The DMO identify 2) Core city, 3) Discover route, and 4) Visiting sites considering the capacity to accept the number of tourists. - ONTT and CR Tourism provide information of tourist circulation to the tourists, such as 3) Discover route, 4) Visiting sites, accommodations and transportations.
- Provide necessary transportation services for tourists to travel within the region	- DMO - ONTT, CR Tourism	- The FTAV assist to provide necessary transportation for tourist circulation. - The DR transport facilitates to provide public transportations.
- Furnish sign boards for tourists on the route	- DR Equipment	- The DR Equipment furnishes sign boards for tourists on the discover route which indicate the tourist to the sites.
- Improve access roads to sites	- DR Equipment	- The DR Equipment improves access roads to each site.
Indicator		Risk
- Tourist circulations will be created in each destination by the year 2020.		Not identified

Strategy	TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern region	
Project	TM-3-5	Develop tourist sites	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Ministry of Culture
Description			
<p>Considering the current situation of the tourist sites in the Southern Region, lack of public facilities, such as public parking and public toilets, is one of the issues to be improved urgently.</p> <p>Those public facilities contribute not only to improve convenience of the tourists, but also to protect tourism resources and environment.</p> <p>In addition to above, many tourist sites have no explanation maps and signboards that provide the information of sites to the tourists and facilitate the tourists walking around the sites.</p> <p>Existing museums are also required to develop its exhibitions more attractive.</p>			
			
Public parking (Ksar Jouamaa, Beni Khédache)		Explanation panel (Kébili Médina)	
Photos : Examples of public facilities for tourists			
Action Plan			
Actions	Relevant organizations	Role	
- Develop public facilities to facilitate or to control tourists	- Ministry of Culture - Municipalities - INP - Ministry of Equipment - Ministry of Agriculture	- The Ministry of Culture and Municipalities, under the authorization of the INP, develop public facilities to facilitate or to control tourists, such as public parking, toilets, and explanation panels. - The Ministry of Equipment and Ministry of Agriculture develops trail route in national park and natural sites, such as the Oases.	
- Develop public museums and archaeological sites	- Ministry of Culture - Agence de Mise en Valeur du Patrimoine et de la Promotion Culturelle (AMVPPC)	- Ministry of Culture develops public museums, in terms of interpretation of local culture. - The AMVPPC develops and manages archaeological sites.	
Indicator		Risk	
- Necessary public facilities will be installed in selected priority site (see TM-3-1) by the year 2020.		- Many sites, such as Ksar and traditional irrigation system in the oasis, are suffering inappropriate restauration/transformation.	

Strategy	TM-3	Rehabilitation and conservation of material and immaterial heritages in the Southern region	
Project	TM-3-6	Mobilize the budget for conservation of material and immaterial heritages	
Intervention Area	—	Implementing agency	Relevant Ministries
Description			
<p>To realize actions for conservation of material and immaterial heritages almost depends on mobilization of the state budget handled by relevant ministries.</p> <p>Providing subsidies for local people who construct or rehabilitate private properties in protected areas in compliance with site management plan is one of incentives to protect the value of the site, because heritages sometimes belongs to private property, for example cave dwelling in Matmata.</p> <p>Using revenue from the “Tourism tax” is one of solutions to mobilize necessary budget.</p> <p>In order to improve quality of exhibition, modification of existing tariff system for the museums, archaeological sites, etc., has also to be considered in terms of financial sustainability.</p>			
Action Plan			
Actions	Relevant organizations		Role
– Mobilize necessary budget for conservation of material and immaterial heritages	– Ministry of Culture – INP		– The Ministry of Culture and the INP mobilize necessary budget for conservation of material and immaterial heritages by using state budget, and revenue from entrance tariffs and the “Tourism tax”.
– Provide subsidies to encourage local people who construct or rehabilitate private properties in protected areas in compliance with site management plan	– MTA – Ministry of Culture – INP		– The MTA, in collaboration with the Ministry of Culture and the INP, provides subsidies to encourage local people who construct or rehabilitate private properties in protected areas in compliance with site management plan by using revenue from the “Tourism tax”.
– Revise entrance tariffs and ticketing systems for each site	– Ministry of Culture – Agence de Mise en Valeur du Patrimoine et de la Promotion Culturelle (AMVPPC)		– The Ministry of Culture and the AMVPPC modify existing tariff system for museums, archaeological sites, etc., in order to mobilize necessary budget for conservation of material and immaterial heritages and improving the quality of exhibition.
Indicator			Risk
– A subsidy system for encouraging local people who provide tourist services will be created by the year 2020.			Not identified

Sector	Strategy	TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society		
			Plan	Actions	Term
Tourism	(a) Institutional and human capacity development plan	TM-4-1: Establish the CBTO	– Establish the “Community Based Tourism Organization (CBTO)” by collaborating with local people	Short	25.9 M TND
		TM-4-2: Develop “Eco-museum”	– Develop “Eco-museum” collaborating with local people	Short	
		TM-4-3: Provide necessary training for local people	– To train local curators, mediators, official tour guides and park rangers for guiding around tourist sites – Provide seminars to the owners of local accommodations (Gite rural, Maison d’hote, etc.) and restaurants in order to promote the CBT with high quality services – Conduct awareness raising campaign to primary and secondary school students – Conduct clean-up campaigns in order to prevent pollution and to control solid waste on tourist sites supported by local people, such as civil societies, NGOs and students	Short	
		TM-4-4: Establish laws, standards or “Cahier des charge” for tourism services	– Establish “Cahier des charge” for “Community Based Tourism (CBT)” – Limit “All inclusive” services provided by large scale hotels that prevents local economy from tourism development – Reconsider urban design dividing tourists from local markets	Short - Mid	
	(b) Facility and infrastructure development plan	TM-4-5: Improve local tourism infrastructure	– Develop infrastructure that allow tourists to access rural areas, such as rural roads and transportation – Improve basic infrastructure and facilities to ensure the safety of tourists who travel in rural areas, such as water supply, wastewater treatment, telecommunication, internet	Short - Mid	—
	(c) Financial and investment plan	TM-4-6: Mobilize the budget for the CBT	– Mobilize financial resources for small-scale projects provided by international cooperation agencies – Provide a lending facility for small and medium sized entrepreneur	Mid	—

Strategy	TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society		
Project	TM-4-1	Establish the CBTO		
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	CBTOs	
Description				
<p>Tourism in Tunisia has been initiated and monopolized by major tour operators or foreign investors outside of the region and local people have not been well involved. Consequently, the majority of revenue from tourism flows out of the region. Furthermore, tourism consumes local materials that local people also rely on, such as limited groundwater, natural environment and infrastructure.</p> <p>As an antithesis of this conventional tourism in Tunisia, Community Based Tourism (CBT) will be recommended. CBT is a form of tourism that aims to include and benefit local communities. Local people are able to host tourists in their village, manage the scheme communally and share the profits. CBT basically intends to:</p> <ol style="list-style-type: none"> 1) Promote tourism initiated by local people; 2) Develop tourism with the involvement and consent of local communities (local people should participate in planning and managing); 3) Share the profits from tourism with the local community; 4) Respect traditional culture, ethics and natural environments; 5) Have mechanisms to protect communities against negative impacts from tourists; 6) Ensure that local people have the right to say “No” to tourism if they don't want it. <p>At the same time, the community will be aware of the value of their cultural and natural heritage and this will foster communal responsibility for conservation of these resources.</p>				
Action Plan				
Actions	Relevant organizations		Role	
- Establish the “Community Based Tourism Organization (CBTO)” by collaborating with local people	<ul style="list-style-type: none"> - ODS - Municipalities - Local NGOs - Local associations - CR Tourism <Not limited> 		<ul style="list-style-type: none"> - ODS, municipalities and CR Tourism establish a “Community Based Tourism Organization (CBTO)” in collaboration with local people, including local NGOs, local associations, etc. - CR Tourism facilitates local people to participate the CBTO. 	
Indicator			Risk	
- A CBTO will be established by the year 2020.			- People have the right to say “No” to tourism development if they don't want to accept the tourists in their community.	

Strategy	TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society		
Project	TM-4-2	Develop “Eco-museum”		
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	CBTOs	

Description

An Eco-museum is a museum largely based on local participation and aiming to enhance the welfare and development of local communities. The term “Eco-museum” established in France in 1971.

Eco-museum provides entire experiences of a culture and heritage related to local community and sphere of activity. This heritage can be material (handicrafts, buildings) or immaterial (personal accounts, knowledge).

The general concepts of the Eco-museum are:

- 1) Conventional museum buildings are not necessary;
- 2) Exhibit local way of life, social surroundings and environment as they are;
- 3) Eco-museum provides, as same as conventional museums, the functions of conserving, researching, exhibiting, educating, to which a distinctly social and community role is added.

As a result, it requires public participation in its activities; it will contribute to community development.



Following example is an Eco-museum in Japan established in small mountain village where local people exhibit their traditional culture in their own houses or farmlands. Local people assist tourists to experience local traditional handicrafts, foods and their culture.



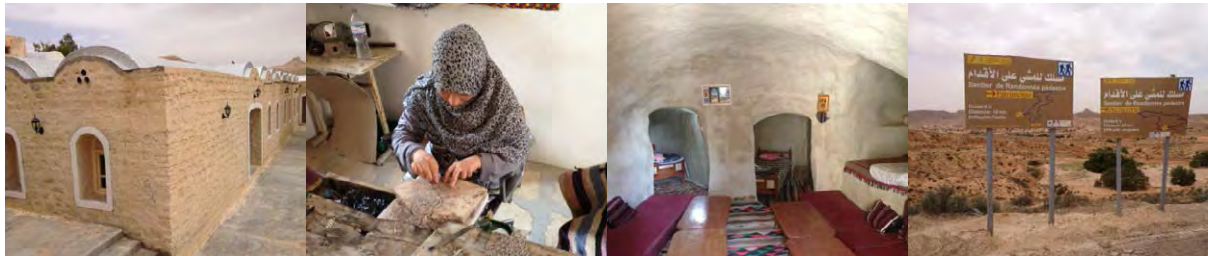
Source: <http://takuminosato.o-oku.jp/>

Action Plan		
Actions	Relevant organizations	Role
- Develop “Eco-museum”	- CBTO	- A CBTO develops an “Eco-museum” collaborating with local people.
Indicator		Risk
- An eco-museum will be established by the year 2020.		Not identified





Strategy	TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society	
Project	TM-4-3	Provide necessary training for local people	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	CBTOs
Description			
<p>In order to develop the CBT, participation and support by local people are necessary, because, without their understanding, if they do not want to accept the tourists in their community, tourism may affect negative impact to the local community and tourism only destroys local traditional culture.</p> <p>Therefore, awareness raising campaigns for local people are required in order that local people aware the profit and risk of tourism, value of their culture and environment, and their roles for enhancement of the CBT.</p> <p>In addition, capacity development of local people is also required in order that local people can provide proper services to the tourists.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- To train local curators, mediators, official tour guides and park rangers for guiding around tourist sites	- Ministry of Culture - DR Culture	- The Ministry of culture and DR Culture provide training course to train local people to be a local curators, mediators, official tour guides and park rangers for guiding around tourist sites.	
- Provide seminars to the owners of local accommodations (Gite rural, Maison d’hote, etc.) and restaurants in order to promote the CBT with high quality services	- ONTT, CR Tourism	- The ONTT and CR Tourism provide seminars to the owners of local accommodations (Gite rural, Maison d’hote, etc.) and restaurants in order to promote high quality services.	
- Conduct awareness raising campaign to primary and secondary school students	- CBTOs	- The CBTO conducts awareness raising campaign to primary and secondary school students in order to raise their awareness and responsibility for local culture and environment.	
- Conduct clean-up campaigns in order to prevent pollution and to control solid waste on tourist sites supported by local people, such as civil societies, NGOs and students	- CBTOs	- The CBTOs conducts clean-up campaigns in order to prevent pollution and to control solid waste on tourist sites supported by local people, such as civil societies, NGOs and students.	
Indicator		Risk	
- All of the professional workers will obtain official licenses by the year 2025.		- People have the right to say “No” to tourism development if they do not want to accept the tourists in their community.	

Strategy	TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society	
Project	TM-4-4	Establish laws, standards or “Cahier des charge” for developing “Community Based Tourism (CBT)”	
Intervention Area	—	Implementing agency	MTA
Description			
<p>In order to ensure sustainable development of the CBT, a “Cahier des charge” for the CBT which allows local people to invite tourists to the local community and prevents negative impacts from tourism to the local people and culture has to be established.</p> <p>In terms of development of the CBT, it should be also noted that conventional urban planning concept in Tunisia is one of the serious physical constraints which prevents tourism development from integrating with local economy development. That is because many tourists spend their stay only inside the hotel without going out from the tourist zone and consequently tourists do not spend any money at local restaurants or markets, because conventional urban planning did not consider or encourage any local restaurants or shops into the tourist zones.</p>			
			
Example: Tourist zone close to local market (Sousse)		Example: Tourist zone far from local market (Djerba, Zarzis)	
Action Plan			
Actions	Relevant organizations	Role	
– Establish “Cahier des charge” for developing “Community Based Tourism (CBT)”	– MTA	– The MTA establishes “Cahier des charge” for the CBT in order that local people can invite tourists to the local community and prevent negative impacts from tourism to the local people and culture.	
– Limit “All inclusive” services provided by large scale hotels that prevents local economy from tourism development	– MTA – FTH	– The MTA, collaborating with the FTH, limits “All inclusive” services provided by large-scale hotels that prevent local economy from tourism development.	
– Reconsider urban design dividing tourists from local markets	– MTA – AFT – Ministry of Equipment	– The MTA, AFT and Ministry of equipment reconsider the concepts of urban design for the “Tourist Zone” that divides tourists from local markets.	
Indicator		Risk	
– The ONTT and CR Tourism establish “Cahier des charge” for the CBT by the year 2020.		– The FTH does not accept any restrictions to limit “All inclusive” services.	

Strategy	TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society	
Project	TM-4-5	Improve local tourism infrastructure	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Relevant agencies
Description			
<p>Following infrastructure will be required to ensure sustainable development of the CBT:</p> <ol style="list-style-type: none"> 1) Accommodation facilities harmonized with local environments and traditions; 2) Sanitation (safe drinking water and sewerage system) and waste management facilities, which does not produce negative impacts on local resources and environment; 3) Medical services for the tourists; 4) Security services (local stations of police or national guards, etc.) to prevent the crime; 5) Telecommunication networks for linking potential customers with local operators, and for emergency calls in case of accidents; 6) Safe and efficient road networks, proper and convenient transport for the access to tourist sites that does not produce a negative impact on local resources or environment. 			
Action Plan			
Actions	Relevant organizations	Role	
- Develop infrastructure that allow tourists to access rural areas, such as rural roads, transportations	- Municipalities - Ministry of Equipment - Ministry of Transport - SONEDE	- Municipalities, the Ministry of Equipment and Ministry of Transport develop infrastructure that allow tourists to access rural areas, such as rural roads, transportations.	
- Improve basic infrastructure and facilities to ensure the safety of tourists who travel in rural areas, such as water supply, wastewater treatment, telecommunication and internet	- ONAS < Not limited >	- The SONEDE, ONAS and relevant agencies improve basic infrastructure and facilities to ensure the safety of tourists who travel in rural areas, such as water supply, wastewater treatment, telecommunication and internet.	
Indicator		Risk	
- All of the accommodations in rural area access basic infrastructure service by the year 2025.		Not identified	

Strategy	TM-4	Development of the Community Based Tourism (CBT) for raising participation, awareness and responsibility of civil society	
Project	TM-4-6	Mobilize the budget for the CBT	
Intervention Area	—	Implementing agency	ODS
Description			
<p>Existing financial incentives provided for the tourism sector are not fully appropriate. Development of new types of tourism (ecotourism, cultural tourism, etc.) initiated by local populations will be subject to financial and banking scheme created especially for small and medium-sized enterprises (SMEs).</p> <p>For example, the STB-SICAR provides credit for SMEs, however, the maximum amount of investment by the STB-SICAR cannot exceed 10 % of the total project cost or 49 % of the company's capital, and the average investment period shall not exceed seven years, despite tourism projects taking more time to appear profitable.</p> <p>Mobilize financial resources for small-scale projects provided by international cooperation agencies are one of options to realize the CBT project.</p>			
			
Artisan centre		Guest house	
		Sign boards	
Photos: Small scale project financed by the international cooperation agency (Béni Khédach)			
Action Plan			
Actions	Relevant organizations	Role	
- Mobilize financial resources for small-scale projects provided by international cooperation agencies	- ODS	- The ODS has to find, mobilize and manage financial resources for small-scale projects provided by international cooperation agencies.	
- Provide a lending facility for small and medium sized entrepreneur	- ODS	- The ODS has to assist entrepreneurs to access lending facilities for small and medium sized enterprises.	
Indicator		Risk	
- A small-scale project of the CBT will be realized by the year 2020, supported by an international donor.		Not identified	



Sector	Strategy	TM-5	Exploitation of agro-tourism by collaboration with agriculture sector		
	Plan		Actions	Term	Cost
Tourism	(a) Institutional and human capacity development plan	TM-5-1: Promote agro-tourism	<ul style="list-style-type: none"> - Establish an agricultural cooperative as a coordinating body for agro-tourism - Marketing appropriately in order to identify the tourists' demands - Exhibit local agricultural and artisanal products at international travel forums or expositions - Provide local specialties to tourists in collaboration with local farmers, hotels and restaurants 	Short	17.3 M TND
		TM-5-2: Provide necessary training for the agro-tourism	<ul style="list-style-type: none"> - Provide necessary training to farmers to develop the agro-tourism - Introduce traditional agricultural technique to young farmers 	Short - Mid	9.2 M TND
		TM-5-3: Establish laws, standards or "Cahier des charge" for agro-tourism	<ul style="list-style-type: none"> - Modify the laws that prevent farmers having tourism on agricultural land 	Short	—
	(b) Facility and infrastructure development plan	TM-5-4: Develop facilities to improve access to the market	<ul style="list-style-type: none"> - Introduce a weekly farmers market inside "Tourist zone" for selling local products to tourists - Create a roadside commercial station or a regional antenna shop for selling local products 	Short	—
	(c) Financial and investment plan	TM-5-5: Mobilize the budget for agro-tourism	<ul style="list-style-type: none"> - Mobilize financial resources for small scale projects provided by international cooperation agencies - Provide a lending facility for farmers 	Mid	—


Strategy	TM-5	Exploitation of agro-tourism by collaboration with agriculture sector	
Project	TM-5-1	Promote agro-tourism	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Agricultural cooperative
Description			
<p>Promoting some tourism products in collaboration with the agriculture sector also has great potential for new types of tourism.</p> <p>Agro-tourism is now widely known as a type of ecotourism where tourists can enjoy a wide range of agricultural activities that include harvesting fruits and vegetables; riding animals; tasting local agricultural products; learning about making wine, olive oil or cheese; or shopping for local products by staying on local farm land or in a farmer's house.</p> <p>In case of the Southern Region, an agro-tourism could be possible in the farmland of olive, dates, fig and pomegranate that correspond to Zarzis and Tataouine (olive), Gabès, Kébili and Tozeur (dates), BéniKhédach (fig) and Gabès (pomegranate) respectively.</p> <p>The agricultural landscapes, such as oases, olive orchards and "Jessour", also have a potential to be a tourism resources of the agro-tourism, as a part of the cultural heritage salient to the region.</p>		 <p style="text-align: center;">Agro-tourism (Olive) (Shodoshima Kagawa, Japan)</p>	
 <p style="text-align: center;">Olive orchard (Zarzis)</p>		 <p style="text-align: center;">Jessour (Tataouine)</p>	
 <p style="text-align: center;">Palmeraie (Tozeur)</p>		Photos: Traditional agricultural landscapes in the Southern Region	
Action Plan			
Actions	Relevant organizations	Role	
- Establish an agricultural cooperative as a coordinating body for agro-tourism	- Ministry of Agriculture - CRDA - DGA - DMO - Municipalities - MTA <Not Limited>	- The Ministry of Agriculture has to assist local farmers to create an agricultural cooperative as a coordinating body for agro-tourism. - Agricultural cooperative will be an organization not only for developing agro-tourism but also for developing productivity of agricultural products, improving financial access of farmers, etc.	
- Marketing appropriately in order to identify the tourists' demands	- MTA	- The MTA conducts marketing researches in order to identify the tourists' demands to agro-tourism.	
- Exhibit local agricultural and artisanal products at international travel forums or expositions	- MTA - ONTT	- The MTA and ONTT exhibit local agricultural and artisanal products at international travel forums or expositions.	
- Provide local specialties to tourists in collaboration with local farmers, hotels and restaurants	- ONTT, CR Tourism - FTH	- The ONTT, CR Tourism and FTH encourage local hotels and restaurants to provide local specialties to tourists in collaboration with local farmers.	

Indicator	Risk
- Sales of and agricultural and artisanal products will increase 20.0% by the year 2025 compared with 2014.	- People have the right to say “No” to agro-tourism if they do not want to accept the tourists in their farmlands. - An installation of modern farming leads to the gradual abandonment of traditional farming systems, and creates discrepancies in the transmission of traditional practices and techniques to younger generations. - Over exploitation of ground water. - Climate change results in negative impacts on agricultural production.

Strategy	TM-5	Exploitation of agro-tourism by collaboration with agriculture sector		
Project	TM-5-2	Provide necessary training for the agro-tourism		
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	ONTT	
Description				
<p>In order to develop an agro-tourism, participation and support by local farmers are necessary, because, without their understanding, if they don't want to accept the tourists in their farmlands, agro-tourism will only affect negative impact to the local community.</p> <p>Therefore, awareness raising campaigns for farmers are required in order that local farmer aware the profit and risk of agro-tourism.</p> <p>In addition, capacity development of farmers is also required in order that local farmer can provide proper services to the tourists.</p>				
Action Plan				
Actions		Relevant organizations		Role
- Provide necessary training to farmers to develop the agro-tourism		- Provide necessary training to farmers to develop the agro-tourism		- ONTT, CR Tourism
- Provide seminars to the local farmers in order to promote agro-tourism with high quality services		- Introduce traditional agricultural technique to young farmers		- CRDA
- Introduce traditional agricultural technique to young farmers		- Provide necessary training to farmers to develop the agro-tourism		- ONTT, CR Tourism
Indicator			Risk	
- All of the professional workers will obtain official licenses by the year 2025.			- People have the right to say "No" to agro-tourism if they don't want to accept the tourists in their farmlands.	

Strategy	TM-5	Exploitation of agro-tourism by collaboration with agriculture sector		
Project	TM-5-3	Establish laws, standards or “Cahier des charge” for agro-tourism		
Intervention Area	—		Implementing agency	MTA
Description				
<p>In order to ensure sustainable development of the agro-tourism, some laws, standards or “Cahier des charge” for agro-tourism that allows local farmers to do tourism business in farmland and invite tourists to their house will be required.</p> <p>When establish some laws, how to prevent negative impacts from tourism to the agriculture has to be taken into consideration.</p>				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Modify the laws that prevent farmers doing tourism business in agricultural land 		<ul style="list-style-type: none"> - MTA - Ministry of Land affairs - Ministry of Agriculture - Ministry of Environment 		<ul style="list-style-type: none"> - The MTA, in collaboration with the Ministry of Land affairs, Ministry of Agriculture and Ministry of Environment, modifies the laws that prevent farmers doing tourism business in agricultural land and inviting the tourists to their house.
<ul style="list-style-type: none"> - Reform existing institutional framework and create a responsible agency for agro-tourism 				<ul style="list-style-type: none"> - The MTA, in collaboration with the Ministry of Land affairs, Ministry of Agriculture and Ministry of Environment, modifies the laws that prevent farmers doing tourism business in agricultural land and inviting the tourists to their house.
Indicator				Risk
<ul style="list-style-type: none"> - A “Cahier des charge” for agro-tourism will be established by the year 2020. 				Not identified

Strategy	TM-5	Exploitation of agro-tourism by collaboration with agriculture sector		
Project	TM-5-4	Develop facilities to improve access to the market		
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	Ministry of Equipment	
Description				
<p>In order to promote local agricultural and artisanal products to the tourists, a weekly farmers market and roadside commercial stations could be proposed.</p> <p>For example, in Hawaii, USA, a temporary weekly market opens every Saturday at the parking space of an University close to the world famous tourist site “Diamond Head” and tourist who visit the Diamond Head also can enjoy local foods and products at the market only five minutes by walk. Thus, if a weekly market will be introduced, inside the existing tourist zones, e.g. Djerba, Zarzis, Douz and Tozeur, are ideal location in order to invite the tourists who would like to buy local souvenirs.</p> <p>Roadside commercial station that has been developed in Japan since 1990’s called “Michi-no-Eki” or a regional shop stand are also one of the options to be proposed. In Japan, roadside commercial station is located in the service area along the highway or beside an intersection of main national roads.</p>				
Action Plan				
Actions	Relevant organizations	Role		
<ul style="list-style-type: none"> – Introduce a weekly farmers market inside “Tourist zone” for selling local agricultural and artisanal products to tourists 	<ul style="list-style-type: none"> – Agricultural cooperative – ONTT, CR Tourism – FTH 	<ul style="list-style-type: none"> – The Agricultural cooperative, in collaboration with the ONTT, CR Tourism and FTH, introduces a weekly farmers market inside “Tourist zone” for selling local agricultural and artisanal products to tourists. <div style="text-align: center;">  <p>Farmer's market (Honolulu Hawaii, USA)</p> </div>		
<ul style="list-style-type: none"> – Create a roadside commercial station or a regional antenna shop 	<ul style="list-style-type: none"> – Municipalities – Ministry of Equipment 	<ul style="list-style-type: none"> – Municipalities and the Ministry of Equipment create a roadside commercial station and regional antenna shop (in hotels, airports, Tunis, foreign countries, etc.) for selling local artisanal and agricultural products. <div style="text-align: center;">  <p>Roadside commercial station (Fujioka Gunma, Japan)</p> </div>		
Indicator		Risk		
<ul style="list-style-type: none"> – A weekly farmers market will be organized by the year 2020. 		Not identified		

Strategy	TM-5	Exploitation of agro-tourism by collaboration with agriculture sector	
Project	TM-5-5	Mobilize the budget for agro-tourism	
Intervention Area	3 Destinations proposed in 6 governorates	Implementing agency	ODS and ONTT
Description			
<p>Existing financial incentives provided for the tourism sector are not fully appropriate. Development of new types of tourism (ecotourism, cultural tourism, etc.) initiated by local populations will be subject to financial and banking scheme created especially for small and medium-sized enterprises (SMEs).</p> <p>For example, the STB-SICAR provides credit for SMEs, however, the maximum amount of investment by the STB-SICAR cannot exceed 10 % of the total project cost or 49 % of the company's capital, and the average investment period shall not exceed seven years, despite tourism projects taking more time to appear profitable.</p> <p>Mobilize financial resources for small-scale projects provided by international cooperation agencies are one of options to realize the agro-tourism project.</p>			
			
<p>Guest house in an Oasis</p> <p>Photos: Small scale project financed by the international cooperation agency (Ksar Hallouf, Béni Khédach)</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Mobilize financial resources for small scale projects provided by international cooperation agencies	- ODS	- The ODS has to find, mobilize and manage financial resources for small-scale agro-tourism projects provided by international cooperation agencies.	
- Provide a lending facility for farmers	- ODS	- The ODS has to assist farmers to access lending facilities for small and medium sized enterprises, in order to start agro-tourism business.	
Indicator		Risk	
- A small-scale agro-tourism project will be realized by the year 2020, supported by an international donor.		Not identified	

3.2.4 Handicrafts

(1) Background

(a) General contexts

According to the official registry, there are over 100 varieties of handicrafts produced in Tunisia. Some of them carry particular cultural meanings and values that have been inherited from previous generations. Economically speaking, handicrafts as a sector plays an important role, contributing to about 4% of the GDP (2013) and absorbing nearly 11% of the total workforce (approximately 350,000 jobs) in the country. About 85% of the workers engaged in the sector are women. It is estimated that continuous investment in the handicrafts sector can lead to approximately 8,000 new jobs annually at a cost of 1,500 USD per job, which is lower compared to other productive sectors.⁶ The annual export value of the sector has reached 380 million dinars, representing nearly 3% of Tunisia's total exports (2013). Important exports⁷ include tapestries and other weaving products (e.g., “malgoum,” “tapis,” “tissage”), palm tree and olive tree wood-based articles, jewelry, metal and leather articles, clay and ceramics, and perfume.

The national strategy for 2000–2016 envisages solid sector growth, which entails the following: (i) an elevated share of GDP from 3.8% to 8%, (ii) an increase in the average value added/produced per artisan from 3,400 dinars to 11,000 dinars, (iii) an income increase from 2,000 dinars to 9,000 dinars per artisan, (iv) an increase in export share from 2.2% to 8.9%, (v) an increase of the average purchase per tourist from 42 dinars to 120 dinars, and (vi) the creation of 112,000 new jobs.

The National Handicraft Office (Office National de l'Artisanat [ONA]) plans and executes activities in alignment with the national strategy. In addition, four other public agencies—the National Council for Handicrafts, National Federation of Handicrafts, Trade and Investment Council, and Technical Centre for Creation, Innovation and Control of Rugs and Weavings—complement the implementation of the national strategy and promote sector competitiveness. In 2015, the ONA merged (reintegrated) to become the Ministry of Tourism. Though no change is foreseen in terms of its functions and work domains, this institutional rearrangement will lead to better alignment between tourism and handicrafts. Additionally, it will define mutually reinforcing value propositions based on the opportunities that each sector offers.

The ONA has elaborated two major public sector-led programs. The National Program of Handicraft Development (Le Programme National de Développement de l'Artisanat [PNDA]) is a flagship national program that supports companies (about 3,500 firms), small enterprises (about 30,000 firms), independent family artisans, and domestic workers in the areas of organizational development, knowledge building and technical skills upgrading, research and innovation, development of craft business incubators, training of trainers and curriculum development and training standards, evaluation of vocational training and education, access to financial resources, quality promotions and marketing, and information dissemination. The Vocational Training Program has commenced through inter-institutional cooperation between the ONA and the Ministry of Professional Training and Employment (National Agency for Employment and Self-Employment), providing support to

⁶ Interview with ONAT official in Tunis. According to the World Bank report (“The Unfinished Revolution: Bringing Opportunity, Good Jobs, and Greater Wealth to All Tunisians,” 2014), the indicative price of job creation is 20,000 USD/job.

⁷ Here, exports include direct exports abroad and indirect exports, which entail purchases by tourists.

incentivize young people to pursue careers in the handicrafts domain. The program also assists new start-ups. In practice, those who aspire to work in the sector are granted six-month internships to acquire hands-on experiences at existing workshops (microenterprises). Meanwhile, these microenterprises benefit from hiring extra employees because of the subsidies provided by the program. However, the post-internship transition to launch start-ups or keep a formal post seems to be challenging, implying the need for additional interventions. One such approach is to establish validated “graduation model(s)” as practical guides for those interested in working in the sector.

Public support also extends to financial assistance. Many individuals and businesses in the sector operate with limited working capital, and they tend to face financial constraints toward purchasing desired raw materials or covering expenses for marketing and promotion. Considering the absence of tangible assets for many businesses, access to financing tailored to the sector’s needs will play an important role for both existing businesses and start-ups.

Table 3.2-21 Financing scheme available for the handicrafts sector

Financier	Beneficiary	Amount (dinars)	Interest rate	Repayment Period	Conditions
Revolving Fund of ONA and Banque Tunisienne de Solidarite (BTS) [1]	Individual artisan (Tunisian nationality)	4,000	5%	4 years	Registered in the ONA system.
	Handicraft enterprises/Supply and trading service providers	10,000			
BTS grants	Artisan with high education diploma, or artisans with professional qualification base	100,000	5%	7 years for repayment	Self-financing of 5% of the project cost is required.
Revolving fund of Development Associations (Associations de Developpement)	Members	5,000	Maximum 5%	3 years	To cover the cost of raw materials or any other article necessary for production.
Fonds National de Promotion de l'Artisanat et des Petits Metiers (FONAPRAM)	Individual artisan Handicraft enterprises	50,000	0% for the FONAPRAM contribution, 10% for bank loan	11 years for FONAPRAM 7 years for bank loan	Use in combination with commercial bank loans. Self-finance between 4%~16% of the total project costs, depending on the total project costs.
Fonds de Promotion et de Décentralisation Industrielle (FOPRODI)	Industry sector of handicraft Benefits for the investor: -70% premium for technical assistance study (capped at 20 million dinars) -10% premium for investments in equipment (capped at 100 million dinars) -50% premium for intangible investments -50% premium for investments in technology (capped 100 million dinars)	5 million dinars	3% (public contribution part)	12 years (public contribution part)	70% commercial loan and 30% self-financing, which can be distributed as 10% of own fund, 60% FOPRODI, 10% venture capital, 20% other associations.
Banque de Financement des Petites et Moyennes Entreprises (BFPME)	New SME set up investments (costs between 0.1-5.0 million dinars) -Expansion of existing SME (costs between 0.08-4 million dinars) -Acquisition of equipment, civil engineering, intangible investments	Maximum 1 million dinars / project	3% (public contribution part)	12 years (public contribution part)	Co-financing only. Direct financing by BFPME, and/or indirect financing using SICAR[2] (Societe d'Investissement a capital risqué du Group STB – venture capital)

[1] BTS finances micro-projects for people who do not normally qualify for commercial bank loans due to lack of assets.

[2] The southern region of Tunisia hosts SODIS-SICAR (Société de Développement et d'Investissement du Sud) as semi-public venture capital.

Source: Elaboration based on ONA data

(b) Context of the South region

The handicrafts sector of the six governorates in the south, when combined, represents 22.5% of the total number of sector workers and 29.0% of the existing enterprises in the country.⁸ Exporting businesses are found largely in the governorate of Médenine. Weaving products made from sheep and camel wool are most commonly produced across the southern region, though differences in local attributes and techniques have been noted. In Gabès, articles made from palm tree leaves and other kinds of vegetable fibres are abundant (e.g., bags, baskets, fans, furniture, etc.), though in Médenine (Gelala), clay-based potteries are important family businesses spanning generations. In fact, they represent the major source of pottery products at the national level, along with potteries in Nabeul (in the northern region). In Tozeur, traditional brick production is a fundamental part of local industry. The brick industry of Tozeur is backed legislatively because 20% of the outer layer of any building (i.e., residence, shop, office) in the governorate must be composed of Tozeurian bricks, thus ensuring a constant demand.

Table 3.2-22 Major handicraft works and raw materials in southern Tunisia

<i>Governorate</i>	<i>Major activities</i>	<i>Materials</i>
Gabes	Weaving, traditional dress, embroidery, vegetable fibre rugs and products, jewelry, leather, painting	Rose stone, sand, wood, stone, grass, palm tree based materials
Medenine	Weaving, embroidery	Clay, vegetable fibre, wool
Tataouine	Weaving, “grara”, tapestry, silverware, “beskri”, textile (coverage), pottery, goldsmith, leather	Clay, wool, skin/leather
Kebili	Bedouin weaving, “fileli”, silverware, “belgha”, traditional shoes, vegetable fiber weaving, wrought iron, leathers, mats	Clay, wool, skin, olive tree, marble, stone, gypsum
Tozeur	Traditional brick, embroidery, weaving	Vegetable fiber, wool
Gafsa	Traditional leather work, vegetable fiber, embroidery, weaving, traditional dress	Vegetable fiber, wool

Source: Elaboration based on ONA data

(2) Summary of Current Conditions Analysis

(a) Potential

The authenticity of handicrafts made with traditional techniques and according to the cultural essence suggests that this sector has significant growth potential. Equally important is the geographic proximity to two major tourism zones in the country—Djerba/Zarzis on the coast and Tozeur/Nafta in the western inland area. More than two million tourists visit annually between these two touristic poles, ensuring business opportunities for souvenir shops, restaurants, hotels, and other venues. Tourism takes different

⁸ These statistics represent only those workers and enterprises registered in the ONAT system, and it is estimated that actual numbers would double these.

forms (e.g., tours). Indeed, the handicrafts and tourism sectors embrace mutually reinforcing growth opportunities. Likewise, foreign markets remain important segments.

The Regional Development Program for Handicraft (Le Programme Regional de Developpement de l'Artisanat [PRDA]),⁹ a regional pilot of the PNDA covering the governorates of Gabès, Kébili, Médenine, and Tataouine, was expanded to capitalize on favourable conditions; however, actual implementation of the program has been halted in the absence of a budget.

(b) Major issues

The central issues that hinder sound growth of the sector include the following: (i) deteriorating linkages along the value chain of raw materials; (ii) weak marketing strategies, particularly in terms of product designs, presentations, and promotions; and (iii) limited access to financial resources for upgrading handicraft businesses (e.g., purchases of better raw materials, usage of e-commerce, transportation and fees to participate in trade fairs, etc.).

Interviews with stakeholders have revealed that obtaining necessary raw materials is becoming a pressing issue for artisans.¹⁰ For example, artisans working in Kébili, Tozeur, and Tataouine may have to travel as far as Gabès or Monastir to buy wool yarn or treated animal skins (leather) of appropriate quality to match their needs. Travel expenses and time weigh heavily on their core activities. This situation, combined with low cash flow during the production period, leaves many artisans with limited options regarding material quality and design variation.

Another fundamental constraint is the lack of marketing by stakeholders, including both public entities (principally the ONA) and the majority of individual artisans or artisan groups. Linkages among the different components for strategic marketing undertaken by public entities (ONA, IRA, ONTT, and CEPEX) and the private sectors remain loose, which inhibits efficient capitalization of existing resources and inputs. For example, the official quality certification system applied to “tissage” under the control of ONA should be more effectively used as a part of the marketing strategy, as it is instrumental for increasing the awareness of a product’s attributes and quality. It should be exploited to demonstrate the value added of the product and promote Tunisian brands in the competitive international market.

At large, the sector is less organized and each production unit is small. Many artisans and enterprises run businesses with tight cash flow. Although different financial schemes and grants are available, eligible activities tend to be limited in terms of flexibility and amount for meeting the needs of stakeholders to upgrade their operations, and most notably, for carrying out market research and promotions.

⁹ PRDA identifies and locates the existing materials and skills that are locally available, carries out training of artisans, enhances logistical support for exports, incorporates modern marketing strategies (e-commerce), and forms alliances with Fair Trade and NGO groups, etc. PRDA prioritizes traditional weaving products (“malgoum” and “Klim”); articles made of wood plant fibers, leather articles, marble and stone works; and traditional metal jewelry, among others. The actual status of execution and impact of the project need to be confirmed with the authorities.

¹⁰ Interviews were conducted with ONA officials and artisans engaged in producing leather and wool-based small articles (e.g., bags, coin cases, and shoes), and weaving products (e.g., tapestries, carpets, traditional clothing)

Table 3.2-23 Summary of current condition of the handicrafts sector

Factor conditions	Demand conditions	Related and supporting industries	Firm strategy, structure, and rivalry
<ul style="list-style-type: none"> • Important source of employment and income generation • Exist broad production base of traditional products (tapestry, carpet, pottery and ceramics, accessories, traditional clothes, etc.) • Raw materials of some products are readily available. • Institutional supports, including quality certification (tapestry and carpets), different funding mechanisms, and construction of Handicrafts Villages in place/underway. 	<ul style="list-style-type: none"> • Local and external markets exist though export is limited. • South regions have two major touristic circuits around Djerba and Tozeur. Tourism development should enhance the business opportunities of handicrafts sector. 	<ul style="list-style-type: none"> • Manufacturing of raw materials (treated leather, sheep and camel wool yarn, in particular) is close to none in the south regions. This incurs additional efforts/expenses for small scale handicrafts workers to obtain necessary raw materials. • (Although limited) Microfinance is accessible to handicrafts workers. 	<ul style="list-style-type: none"> • Production unit is largely very small. Scalable but financing is limited partly due to the decline in the domestic markets after 2009. • Limited operational cash- flow and marketing/ promotional capacities. • Substantial competition expected against similar products made in other countries which are highly competitive and are already internationally recognized in the external markets. • Moderate to strong rivalry with cheaper import products in the domestic market. • Strong rivalry with Moroccan handicrafts in foreign markets.

Source: JET

(3) Sector Strategy and Plans

The strategy for developing the handicrafts sector embodies recommendations for raising its competitiveness by focusing primarily on products that are scalable and that offer greater export value. This approach is based on the premise that the positive effects to be generated will gradually influence larger segments of the sector's actors ("spillover effect").

Table 3.2-24 Effects and indicators of the handicrafts sector strategy

Code	Strategy	Effects and Impacts			Indicator
		Value-added	Job creation	Sustainability	
HC-1	Enhancing competitiveness of handicrafts made in the South Region.	<ul style="list-style-type: none"> • Increase of production and sales of higher value added handicrafts • Improved supply chain. 	<ul style="list-style-type: none"> • Increase of economically viable self-employment and microenterprises. 	<ul style="list-style-type: none"> • Sustainable employment opportunities. • Conservation of traditional knowledge and technique and authentic crafts. • Improved institutional capacity of ONA. • Higher awareness of the handicrafts and their cultural values. 	<ul style="list-style-type: none"> • Number of new businesses (manufacturer, retailers) • Number of new job • Income increase of the sector workers / higher turnover of the firms • Number of sales outlets • Sales volume and values at Handicrafts villages • Export values • Number of functional cultural/learning facilities

Source: JICA Study Team

(a) HC-1: Enhancing competitiveness of handicrafts produced in the southern region

(i) Description of the Strategy

This strategy will respond to the pressing issue as well as the fundamental aspects that need to be addressed for sustainability. Enhancing competitiveness shall be achieved by: (i) focusing on specific value chains of strategic importance, such as materials used in a wide range of products; (ii) introducing a more comprehensive marketing approach encompassing market research, product development, sales promotion, and branding; and (iii) improving managerial knowledge and skills of the actors and their access to financial resources. Three specific plans, with the first employing a priority cluster approach and the other two considering actors across the sector, constitute the strategy as described in the following table.

Strategy	HC-1	Enhancing competitiveness of handicrafts produced in the southern region		
	Plan	Actions	Term	Costs
HC-1-1:	Development and strengthening of value chain of wool and leather handicrafts	<ul style="list-style-type: none"> - Detailed needs assessment - Assessment and monitoring of volume of relevant livestock - Feasibility study (supply chain improvement) - Elaboration of business plan (s) - Investment promotion (ODS) 	<p>Short (Needs assessment, F/S and post F/S discussion)</p> <p>Medium (Elaboration of business plan and investment promotion)</p>	<p>USD 54,000</p> <p>Local consultants (4), International consultant (1)</p>
HC-1-2:	Reinforcement of marketing and commercialization of "Made in South of Tunisia" products (traditional and modern design)	<ul style="list-style-type: none"> - Stocktaking and conservation of traditional knowledge and techniques (registration of master artisans) - Establishment and application of quality standards - Building of brand equity and promotion - Strengthening of linkages with tourism - Improvement of management and usage of existing facilities, including the governorate artisanal villages and other sales and promotional outlets 	Short to Medium	<p>USD 234,000</p> <p>Local consultants (5)</p> <p>International consultants (4)</p> <p>(excluding cost of international training)</p>

<p>HC-1-3 Strengthening of micro- and small-scale handicrafts enterprises</p>	<p>– Technical assistance with production, marketing, and business management – Support for access to financing</p>	<p>Short to Medium</p>	<p>USD 220,000 Local consultants (4), International consultants (4), grants/revolving</p>
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(ii) Direct/Indirect Effects

The strategy will aim for the following direct and/or indirect effects:

- Increase in production and sales of handicrafts of greater value
- Improved value chain for wool and leather
- Increase in economically viable self-employment and number of microenterprises
- Conservation of traditional knowledge and techniques
- Improved institutional capacity of ONA
- Greater awareness of handicrafts and cultural values

(iii) Indicators

The effects or impacts of the strategy will be measured by the following indicators:

- Increase in number of new businesses (manufacturers, retailers)
- Increase in number of new jobs
- Income increase for sector workers/less turnover in enterprises Increase in number of sales outlets
- Greater sales volume and values at handicraft villages
- Greater export values
- Increase in number of functional cultural/learning facilities

(iv) Development Plan

Institutional and Human Development Plan

Short-term (2016–2020)

- Capacity building needs assessment and training of sector workers
- Capacity building of ONA

Mid-term (2021–2025)

- Skill training
- Building of public awareness for the cultural value of handicrafts

Facility and Infrastructure Development Plan

Short-term (2016–2020)

- Evaluation of existing artisanal villages and revision of future plans
- Market study: Assessment of other local markets, national markets, and sales outlets, including linkages with the tourism sector

Mid-term (2021–2025)

- Improvement of sales outlets (local, national)
- Building of public awareness for the cultural value of handicrafts

Financial and Investment Plan

Short-term (2016–2020)

- Evaluation of existing financial schemes available to sector workers
- Investment promotion in collaboration with the tourism sector

Mid-term (2021–2025)

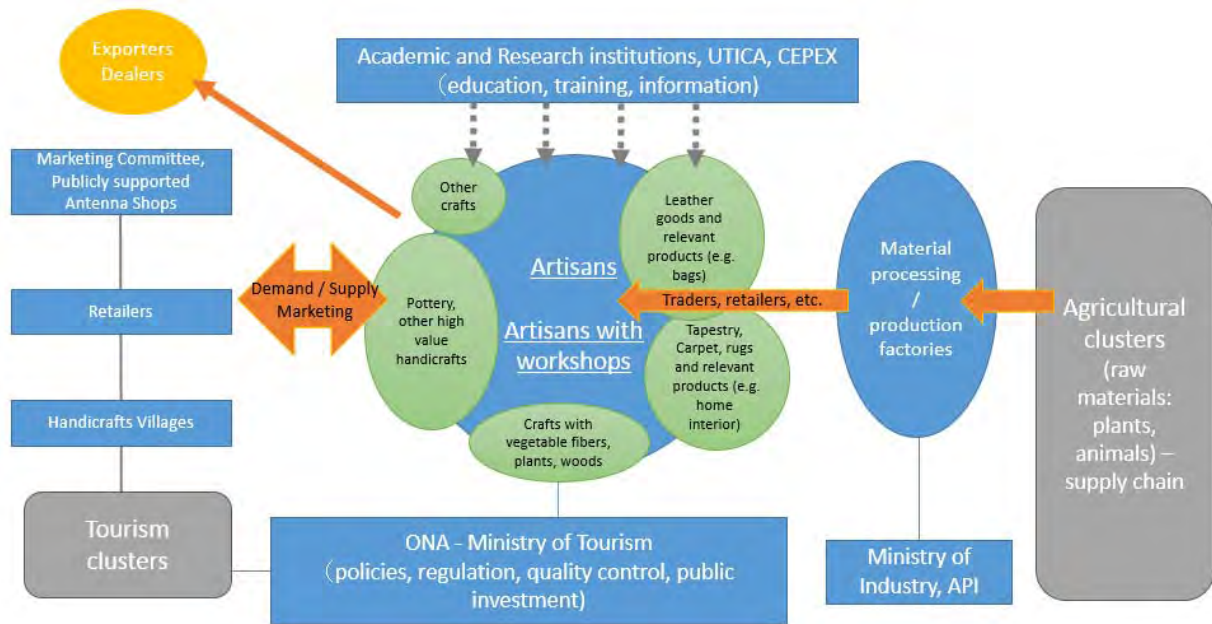
- Operation of (potential) grants and/or revolving fund to support microenterprises
- Investment promotion in collaboration with the tourism sector

Strategy	HC-1	Enhancing competitiveness of handicrafts produced in the southern region		
Plan	HC-1-1	Development and strengthening of the value chain for wool and leather handicrafts		
Intervention Area	Médenine, Tataouine, Tozeur, Kébili, Gafsa	Implementing agency	ODS, in coordination with ONA and APII	
Description				
<p>Wool (sheep and camel) and leather are essential primary materials for many handicraft products widely produced in the southern region, such as tapestries, carpets, bags, and other accessories. Hence, access to quality wool yarn and leather at reasonable prices has a significant implication for the production cost and quality competitiveness of handicrafts made from these materials.</p> <p>On the supply side, today, there is neither a local manufacturer to prepare these raw materials nor an established stable supply chain in the southern governorates. The closest major manufacturers are found mainly in Monastir.</p> <p>On the demand side, though there are substantial demands for processed raw materials, the fragmented structure of the sector and weak organization among the artisans inhibit them from obtaining the materials. Many artisans reportedly purchase materials individually, either by traveling to major cities (Monastir, Gabès, Zarzis) or buying at local retail stores where the prices are higher. Supplies at local stores are limited in quantity, and quality varies in terms of colour and used raw material.</p> <p>The aim of the proposed plan is to address the needs of artisans for better access to primary materials of good quality at reasonable prices and, at the same time, create more jobs by establishing factories to collect raw materials and process them for preparation of ready-to-use materials.</p>				
Action Plan				
Action	Relevant organizations		Roles	
1. Needs assessments of primary processed raw materials in the region	OEP, ODS, ONA, API, UTICA		(OEP) Promotion of raising relevant livestock and monitoring of production volume; control of raw material (unprocessed wool and leather) imports from neighbouring countries	
2. Assessment and monitoring of volume of relevant livestock			(ODS) Investment promotion and support for potential investor(s) to access to industrial zone and finance; oversight of investment appraisal and phase thereafter to facilitate inter-institutional coordination for the investor(s) to collect necessary information and make decisions	
3. Assessment of the bases of the artisans			(ONA and UTICA) Detailed needs assessment and potential organization of the artisans (e.g., master artisans system)	
4. Introduction of system to recognize the master artisans			(APII) Provision of assistance in executing feasibility studies, including environmental assessment	
5. Feasibility studies and investment promotion				
Indicators			Risks (external conditions)	
<ul style="list-style-type: none"> - Reduced cost and improved availability of materials for the artisans - Number of new businesses established (manufacturer, retailers) - Number of new jobs generated 			<ul style="list-style-type: none"> - Insufficient number of livestock - Improved accessibility to cheap materials from outside the region 	

Strategy	HC-1	Enhancing competitiveness of handicrafts of the southern region	
Plan	HC-1-2	Reinforcement of marketing and commercialization of handicrafts	
Intervention Area	Six governorates	Implementing agency	ONA in coordination with Tourism and Regional Taskforces
Description			
<p>The Tunisian handicrafts sector is facing two major challenges: (1) an increasing entry of cheap imports from China to the local markets as substitutions for locally produced products, and (2) general sales stagnation from moderate growth in the number of tourists and the dominance of all-inclusive tourism that is loosely linked to opportunities to sell handicrafts. In international markets, Tunisian products face fierce competition with those from Morocco.</p> <p>To address these issues, the proposed plan aims to strengthen the overall quality and attractiveness of the Made-in-(South) Tunisia products and quality control of the products, as well as improve marketing and commercialization efforts. Such efforts should particularly capitalize on established signature handicrafts, including tapestries of Gafsa, pottery from Guelala, furniture and other household articles made of palm tree leaves and olive trees, weaving products made in different governorates, Kébili shoes, etc.</p> <p>The plan will elaborate and launch promotions and advertisements through different communication channels (TV commercials, travel magazines, social network tools, etc.) and effective use of existing infrastructure, including artisanal villages, museums, hotels, other sales and promotional outlets, and cultural learning facilities both in Tunis and in each governorate.</p>			
Action Plan			
Action	Relevant organizations	Roles	
1. Institutionalization of a Marketing Committee; building of brand equity and promotion of local and international markets	ONA/Ministry of Tourism, CEPEX	<ul style="list-style-type: none"> - Jointly develop brand and build image for Made in South of Tunisia products - ONA to collaborate with CEPEX to promote South of Tunisia brand for export promotion 	
2. Enforcement of product quality and issuance of certificate of origin, including the identification and protection of highly skilled master artisans	ONA/Ministry of Tourism, Ministry of Culture, professional training institutions	<ul style="list-style-type: none"> - Identify and endorse products that use traditional and authentic designs and techniques. Collect information and manage database. - Establish system to recognize the master artisans to preserve their knowledge and skills and enable capacity building of other artisans as necessary. - Manage and Control certification system 	
3. Elaboration and implementation of an aggressive sector marketing strategy targeting domestic awareness raising and foreign visitors	ONA/Ministry of Tourism, Ministry of Culture (to confirm), Ministry of Vocational Training and Employment	<p>(ONA/Ministry of Tourism)</p> <ul style="list-style-type: none"> - Coordination of promotion of cultural aspects of handicrafts products linked with tourism - Expanded sales outlets of products - Elaboration and implementation of advertisements for promotion <p>(Ministry of Education and ONA)</p> <ul style="list-style-type: none"> - Raise domestic awareness of Made in Tunisia products and cultural heritages 	

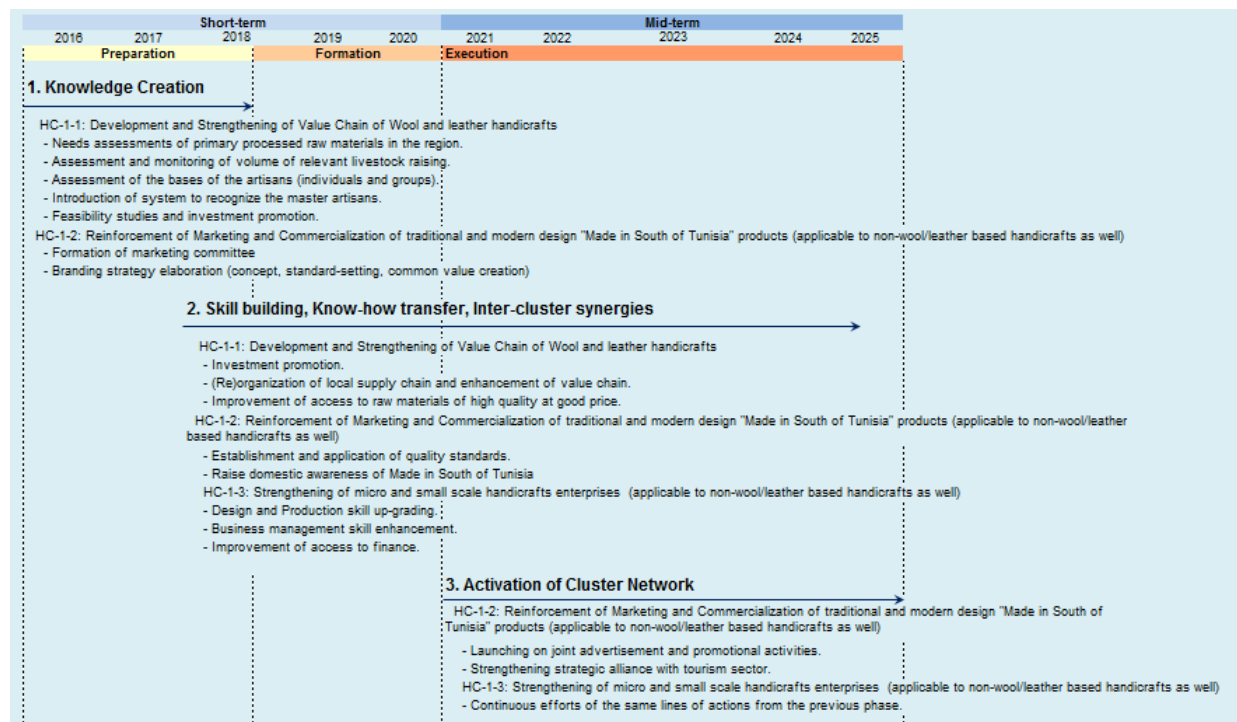
Indicators	Risks (external conditions)
<ul style="list-style-type: none">- Number of functional sales outlets and other promotional facilities- Increase in visits to artisanal villages- Growth in sales volume and values- Growth in export values and diversification	<ul style="list-style-type: none">- Imports of substitute products (cheaper, similar)- Decline in number of tourists- Unfavourable sales conditions (exchange rates, shipping costs)

Strategy	HC-1	Enhancing competitiveness of handicrafts of the southern region	
Plan	HC-1-3	Strengthening of micro- and small-scale handicraft enterprises	
Intervention Area	Six governorates	Implementing agency	ONA
Description			
<p>Individual artisans and micro- and small-scale businesses with limited financial resources and managerial knowledge constitute a large part of the sector. Many face common difficulties, such as the lack of financial resources to upgrade their product quality and take action for sales promotions (including establishing shops and participating in trade fairs, etc.), as well as insufficient marketing related knowledge and experiences.</p> <p>The proposed plan addresses the aforementioned issues and aims to improve the business managerial capacities and production skills of micro- and small-scale handicraft enterprises by improving access to technical assistance and finance. The relevant existing national organizations are likely to need external technical assistance in elaborating and implementing training modules.</p>			
Action Plan			
Action	Relevant organizations	Roles	
1. Strengthening of market-driven production and basic business management skills	ONA, professional training centres, CEPEX	<ul style="list-style-type: none"> - (ONA) Planning, organization, execution and monitoring of training programs - (Professional training centres) Provision of technical assistance in business-related knowledge and skills - (CEPEX) Facilitation to export, provision of information and opportunities for promotional activities abroad 	
2. Supporting access to financial resources	ONA, BTS, microfinance institutions	<ul style="list-style-type: none"> - (ONA) Oversight and improved access to finance. Needs assessment of access to finance and revision of existing grant/loan schemes for improvement in collaboration with BTS - (ONA) Provision of microfinance and grants. Exploration of collaboration with microfinance institutions to develop specific financial products and services for the sector 	
Indicators		Risks (external conditions)	
<ul style="list-style-type: none"> - Increase in public grants accessed and disbursed - Increased access to microcredit and other commercial loans - Sector growth (number of enterprises, sales, profits) 		<ul style="list-style-type: none"> - Timid growth of microfinance sector - Decrease in public budget allocation - Strong competition with Moroccan and other similar handicraft products - Shrinkage of tourism sector 	



Elaboration by JICA expert

Figure 3.2-4 Image of clustering of handicrafts sector



Elaboration by JICA expert

Figure 3.2-5 Implementation Plan scheduling for handicrafts sector

3.3 Development strategies, plans and action plans for infrastructure development

3.3.1 Transport

(1) General framework of the Transport Sector in Tunisia and in Southern Region

Tunisia is neither an island nor an isolated territory. The country has borders with Algeria and Libya, and Italy is 145 km away on opposite coast of Sicily Strait. In spite of this, most maps do not represent its neighbouring countries, Algeria and Libya, or the strategic position of Tunisia in the central Mediterranean Sea.

The levels of population in neighbouring areas of South Tunisia are significant:

- (1) Area Touggourt - El Oued: = circa 175,000 inhabitants (2008, Algerian census)
- (2) Area Ouargla - Hassi Messaoud: = circa 180,000 inhabitants (id.)
- (3) Area of Tripoli: = circa 1,680,000 inhabitants (Wikipedia)
- (4) South-West Libya = circa 450,000 inhabitants (Fezzan region 2006, Wikipedia)

For better and proper view of issues related to trade, mobility and transport, especially in the South part of Tunisia, the physical distances between cities in and outside of Tunisia have to be properly considered¹¹ (see map on following page).

In the case of Zarzis city for instance (see infra proposal TR-5-5 development of the port of Zarzis):

- (1) Zarzis - Libyan border (Ras Jedir): 80 km approximately
- (2) Zarzis - Tripoli: 200 km, around 3 hours by road
- (3) Zarzis - Algerian border (Hazoua, near Tozeur): 250 km (bird's-eye view)
- (4) Zarzis - Tunis: around 550 km by road, air distance 376 km
- (5) Zarzis Port - La Valette port (Malta): 410 km

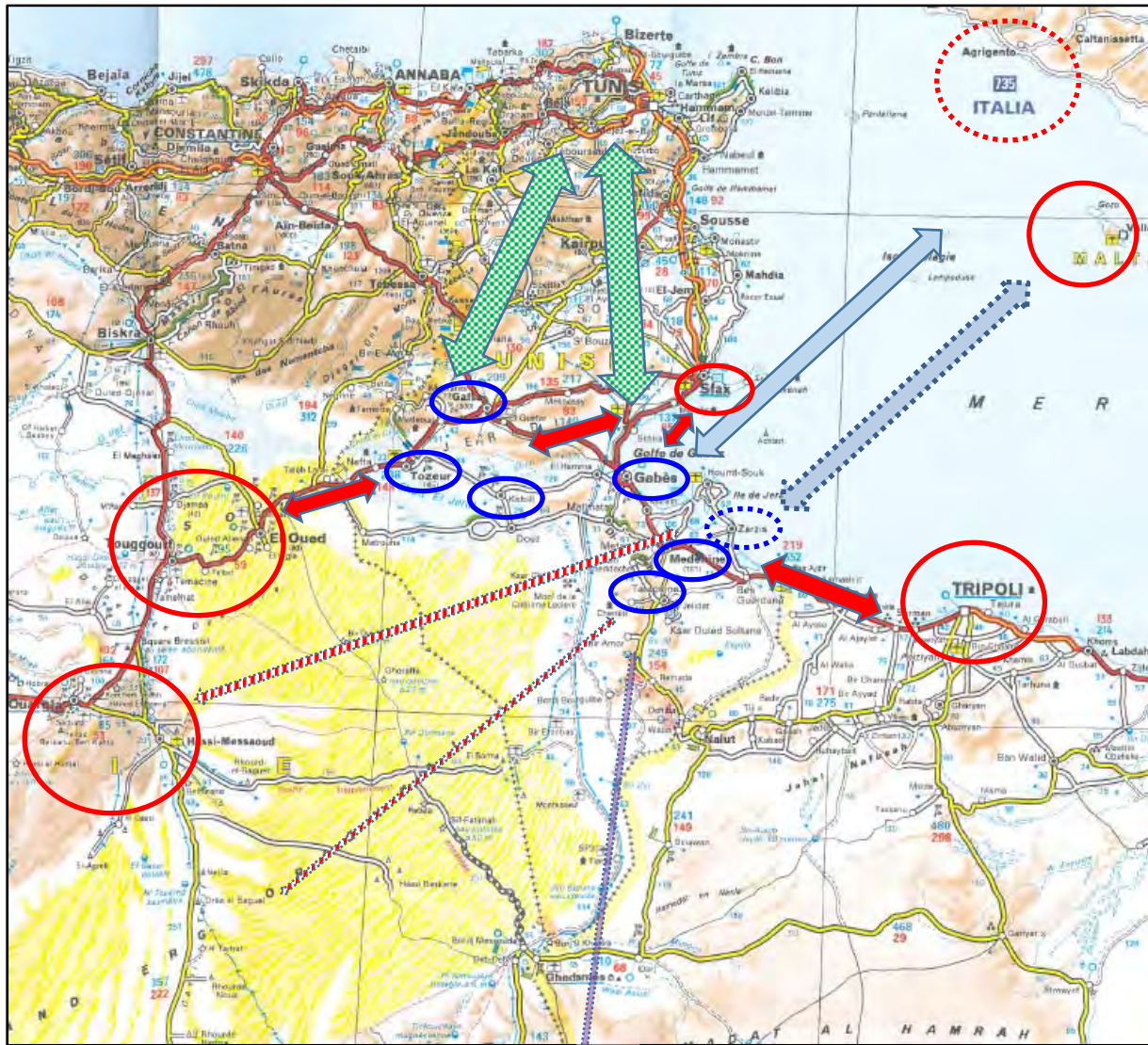
The potential *Hinterland*¹² of the Zarzis port should then be considered with due consideration to trans-border possibilities with Algeria and Libya. Increased connections with these areas will increase market opportunities.

In addition, La Valette in Malta is the third biggest port in the Mediterranean Sea in term of transshipment of freight, a hub on the Europe-Asia maritime road with an important part dedicated to transport by containers.

An important point to consider: the Zarzis port is nearer to the La Valette port in Malta than to the Radès port in Tunis.

¹¹ Note: the chart of next page was displayed on the occasion of the June 2014 steering committee of the study in Tunis.









¹² Hinterland is a German word used in Europe to describe the territory likely to use a port facility.



Source: Abstract from Michelin map n° 741 "Africa North and West"

Scale: 1: 5,200,000

Figure 3.3-1 Main transport axis and connections around the Study area

-  Main cities in the six Governorates of the Study Area ( tourist area)
-  Main areas of influence outside the South region
-  Flows towards North Tunisia (and Tunis), main axis
-  Transnational connections (by road, from interviews)
-  Transnational connections – Petroleum industry (by road)
-  Maritime connections (existing, from Gabès and Zaris) (expansion of the Zaris port see TR 5-5)
-  North-South connections (now scarce)

A complementary set of points must be considered on the map (see below) since cross-border commercial and passenger links between the region of Gabès-Gafsa and the region of Constantine in Algeria are of importance and this importance should grow in the future with the increase of trade.

This can also be the case for the connections between South Tunisia and South-West Libya.

The development of trade has to be facilitated by the development of new border posts on both borders.

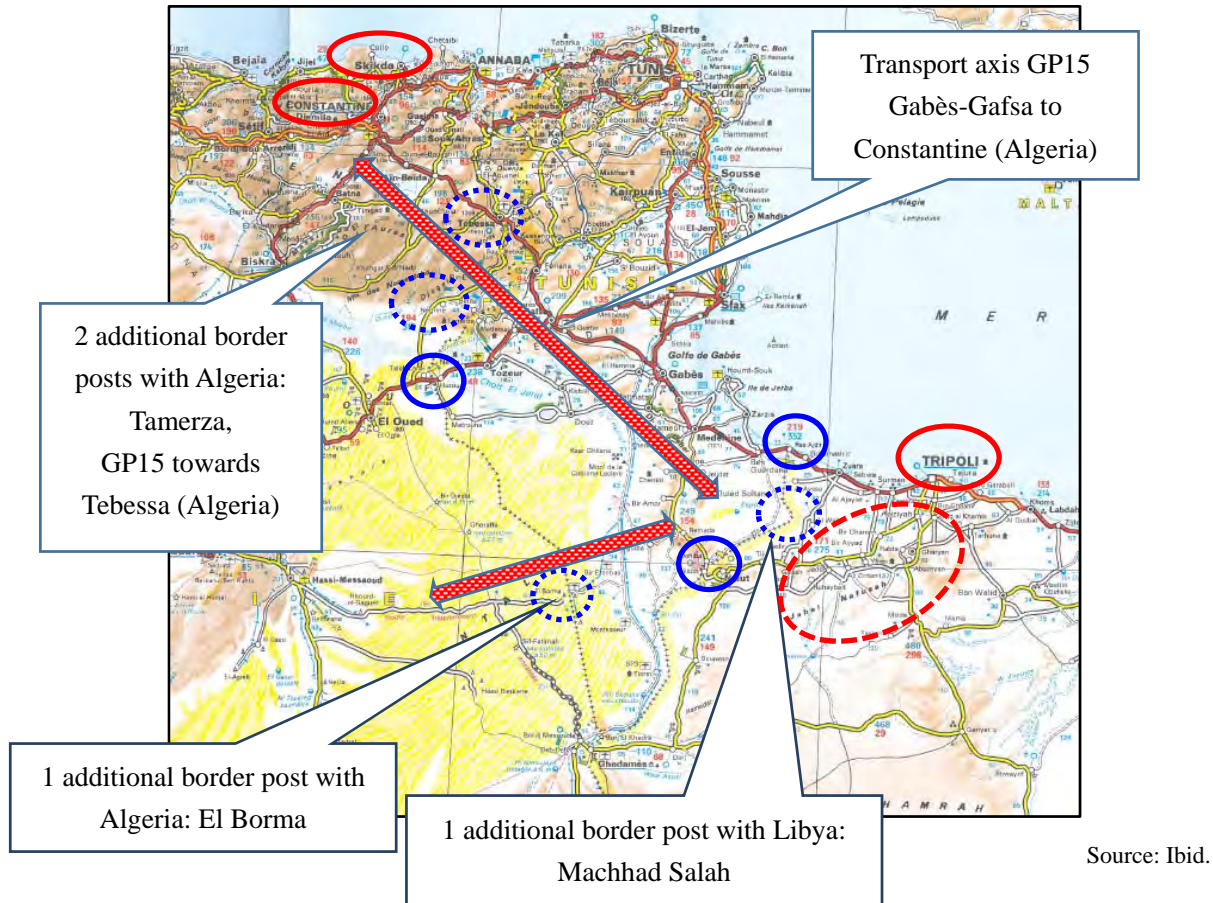




Figure 3.3-2 Connection between Algeria and Libya through South Tunisia

-  New possible border posts
-  Region of South-West Libya

(2) Summary of current condition and major development issues

The transport issues in the Southern Region have to be considered for each transport mode: road, bus, rail, ship, marine and air. Their interactions and supporting elements, such as border posts and logistics centres, must also be considered.

The general state of existing infrastructure is good, thus we will mainly focus in this chapter on the development issues for the transport network and missing links or shortcomings.

(a) Road network

The Tunisian road network in South Tunisia comprises at present 19,430 km of roads, sealed at a level of 77% approximately, 360 km of highways and 3,540 structural works.

The road network in the Southern Region is in a reasonable state, homogeneous quality throughout the region, and properly maintained under the supervision of the Regional Directorates of the Ministry of Equipment. However, there are some issues on the development of the road network, as follows;

- There is not yet any highway in operation in the area since the North-South highway Sfax-Gabès-Médenine-Ras Jedir is still under construction at present. This delay also causes the late development to other connections in the area, particularly East-West trunk roads:
 - a) Between Gabès-Gafsa and Algerian border which should be largely developed, or
 - b) Inland trunk roads between Gafsa and Sidi Bouzid Governorates ;
 in order to provide better connections among the Southern Region and other parts of Tunisia.
- RN1 between Ras Jedir and Sfax and the Chaussée Romaine to the Djerba Island suffer from the overloading of the vehicles. The axle loads of many trucks exceed the authorized 13 tons per axle.
- There is only one road to access the Djerba Island, which is one of the most important developing resources in the Southern Region for the tourism industry. Another way to access the Djerba Island from the main land is by ferry from Jorf to Ajim, which has longer travel and waiting times. The construction of a new bridge is expected to improve accessibility to the Djerba Island.
- Severe leaks of oil from old and poorly maintained vehicles cause the deterioration of the pavement and a long-term damage to local environments, such as the pollution of underground water. This must be tackled by appropriate road inspection and traffic control.

- Pavement ratio of low-volume roads should be improved based on traffic and soil conditions. The pavement ratio in whole Tunisia is 76.8%, but this ratio declines to 32.4% in Tataouine Governorate, for instance. Figure 3.3-3 shows the road length and pavement ratio in each governorate.

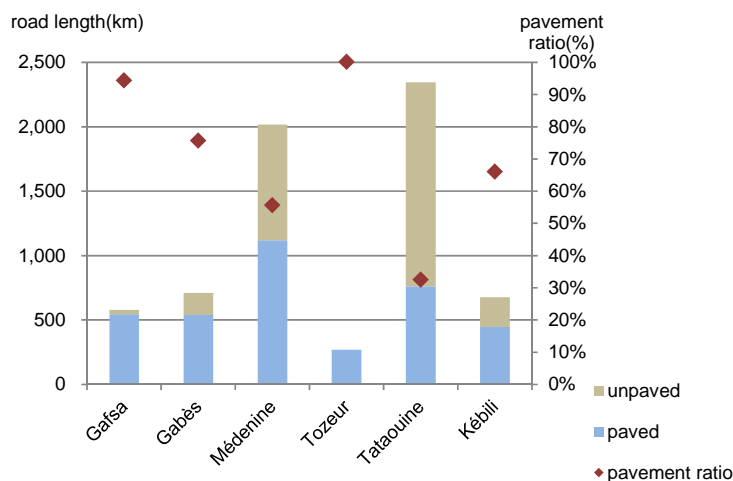
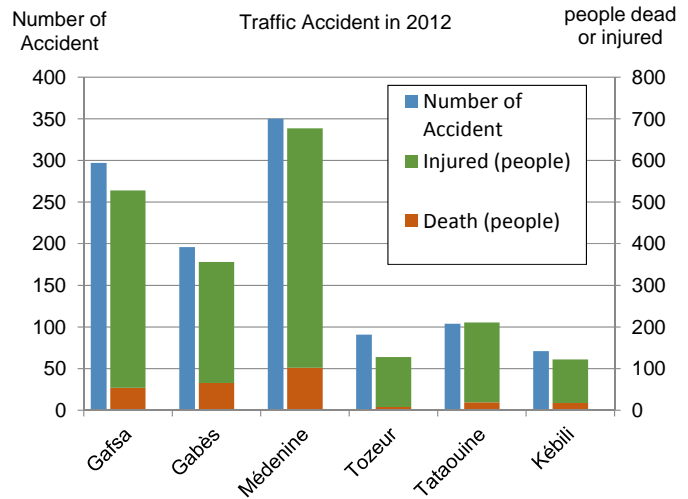


Figure 3.3-3 Road length and pavement ratio

- Road safety for all road users and roadside residents should be more thoroughly considered since an economy cannot sustainably develop with such risks. Road accidents frequently occur in the governorates of Médenine and Gafsa that have larger population. Figure 3.3-4 shows the number of traffic accidents and people dead or injured due to the traffic accidents.



Source: National Road Safety Observatory

Figure 3.3-4 Traffic accidents and casualties in 2012

(b) Railway network

The railway network in the Southern Region has been developed mainly for mining and industrial purposes, where it links the phosphate production areas and the ports. However, it is not often convenient for the needs of the passengers. In addition, the construction of the Gabès-Médenine section of the railway has not been completed despite the start of substructure works. As a result, the network (equipment, facilities, vehicles and image) is aging and losing attractiveness towards existing and potential users, whether they are individuals or companies.

The existing development plans for railway transport and railway network comprise 4 priorities as follows;

- Refurbishment of existing tracks, equipment (some transport passenger cars date back from 1982) and facilities (stations);
- Development of policy towards passenger transport by the increase of equipment quality and of transport speed; with Tunis and with Monastir (universities) as key destinations; appropriate travel time; tariff; and commercial policy;
- Additions to the existing network by connecting the missing links for passenger transport Gabès-Médenine and Médenine-Tataouine.
- Creation of additional links :
 - a) Tataouine to Zarzis, directly or via Médenine, for the transportation of the gypsum extracted north of Tataouine to the Zarzis Port;
 - b) High-speed trains and high-speed tracks for passenger transport (Tripoli-Tunis-Algiers route) with the possibility of freight transport.

(c) Ports

98% of Tunisian exports are made through ports for a total volume of an average of 30 million tons, reduced to 25 million tons during the past years. Two ports (Gabès and Zarzis) are located in the study area. Interactions with other port infrastructures have to be considered:

- Tunis/Radès, the main port of the country;
- Enfidha, the future big port facility of Tunisia (planned near Sousse);

- Sfax, the biggest port in the area at present;
- Skhira, port specialized in chemical industry and petroleum products (this port, connected with the rail network, is not managed by the Merchant Marine and Ports Authority OMMP¹³ but by a private entity, Trapsa - *Compagnie des transports par pipe-line au Sahara* (Volume of activity: 6 MT/year of petroleum and chemicals).

This fact is of importance since, due to the planned improvement of the roads in South Tunisia (see proposals for projects), the freight, either by road or by rail, will tend to reach the areas where the prices are the most competitive, the transport facilities the most performing and the delays of loading the shortest.

For instance, the distance between Tunis and Gafsa is around 350 km. By the ECOSO highway to be constructed, the corresponding travel time will be around 3:30 hours at 100 km/h speed, to be compared with the time needed to reach other facilities and to process and send freight.

In addition, freight transport by container increases sharply (+12% per year in Tunisia during these last five years). Port facilities without appropriate equipment to handle containers may face at least comparative disadvantage. On the other hand, this implies having space enough to store containers nearby the port facility and related logistics (trucks, offices, forklifts...)¹⁴.

Cruise activity is promising (already started in La Goulette), but necessitates facilities and environment fitted to tourists.

The Gabès Port and the Zarzis Port in the Southern Region face different constraints as follows:

- Gabès Port is located inside a dense urban/industrial area and can only develop inside its boundaries by making the best use of its existing land due to the difficulties and costs of extensions;
- Zarzis Port has a lot of potential for development (135 ha of land secured beside the port) but little industrial and economic potential which can promote the port business at present.

The development of the Zarzis Port is the potential key to the sustainable development, should one or more of the following favourable conditions occur;

- Railway track bringing the gypsum ore from Tataouine to the port;
- Fixed regular maritime services with one or more destinations;
- Connection with the Médenine - Ras Jedir highway;
- Logistics Park and/or Free Trade Zone near the port bringing regular freight traffic for import, export or both.

(see here after corresponding projects)

(d) Airports

The present situation of airports in the Southern Region (Djerba/Gabès/Gafsa/Tozeur) is far from ideal. As a follow-up to the crisis in 2008 and the reduction of the number of tourists after the revolution, the

¹³ OMMP stands for *Office de la Marine Marchande et des Ports* www.ommp.nat.tn, entity supervised by the ministry of Transport and in charge to ensure proper and quick treatment of ships and goods mooring in Tunisia's commercial harbours and ensure administration of 3 maritime issues: staff, ships and maritime safety. A comprehensive development plan for horizon 2020 is under preparation (not available by the time of the study).

¹⁴ Total containers in Tunisia 2011: 444,972 units (TEU's / EVP) (OMMP annual report 2011 p. 53, for the seven commercial ports). Gabès: 58 Zarzis: 71. No appropriate facilities.

number of flights decreased sharply.

At least 20 to 25% of the traffic is missing since 2008, peak year, as shown in Table 3.3-1 below.

Table 3.3-1 Capacities and levels of traffic of the airports from South Tunisia

Airport	Capacity (thousands)	Results 2010	Results 2014	passengers 2014/ passengers 2010	passengers 2014/ max. capacity
Djerba Zarzis	4,000,000	2,433,662	1,952,176	-19,8%	48,8%
Tozeur Nafta	400,000	93,741	34,278	-63,4%	8,6%
Gabès Matmata	200,000	10,293	20,438	198,6%	10,2%
Gafsa Ksar	200,000	6,625	3,200	-51,7%	1,6%

Source: Ministry of Transport

For the Djerba airport, the decrease is both in number of passengers and in number of planes: 25,281 in 2008, 18,519 in 2013 (-26.7%). The level of service is also clearly diminishing.

In addition, the existing airports located in the Southern Region, are far from Tataouine, Médenine and the touristic areas of the South (*ksour*, Sahara region, etc.). In addition, the Gabès and Gafsa Airports only provide at present an infrequent service (2 flights a week to/from Tunis) with only one carrier (Tunisair Express) and a service day that has been modified.

However, the situation might change if:

- the overall situation regarding economic and tourist activities in South Tunisia improves ;
- the “Open Skies” negotiations with the European Union come to a favourable conclusion (the open skies agreement led to a significant development of air transport in Morocco thanks to an increased supply of air flight connections and subsequent decrease in prices due to competition¹⁵).

Transaction volume could increase back to the 2008 levels or more, give a new impetus to the 4 existing airports and fill up the terminals with induced job creations.

If this condition is fulfilled (Note: this is a necessary prerequisite, since otherwise the whole air transport sector in the region could become unsettled), a new airport in the South of South Tunisia area (Tataouine Governorate) could be considered, based on this increase of the number of users.

(e) Urban public transport and bus network

Bus transport in Tunisia is organized at present at the national level. The inter-city bus network is operated by SNTRI and regional companies, which the Tunisian State owns. This has caused difficulties to the development of the network (new lines, bus stops alterations, etc.) and also to the tariff structure due to the administration system.

Table 3.3-2 showing the estimate of population in the delegations of South Tunisia by 2035 permits to consider several cities or group of cities where the creation or development of public urban transport

¹⁵ This agreement would necessitate the implementation of various measures, including a restructuring of the national company Tunisair, development and upgrade of infrastructures and modification of related legislative framework.

network can be foreseen by 2035 or before, if by that time the size of the cities / group of cities and delegations is over 30,000 inhabitants:

Table 3.3-2 Urban transport areas in South Tunisia by 2035

Governorate	Cities/group of cities and delegations		Population (thousands) (2035 estimate)
Gabès	1	Gabès (Gabès - Medina, West, South -, Ghannouch, El Metouia)	175.1
	2	El Hama	84.5
	3	Mareth	71.7
Gafsa	4	Gafsa (Gafsa - North, South -, El Ksar, Sidi Aich)	177.1
	5	Metlaoui	42,8
	6	Sned	41,0
Kébili	7	Kébili (North and South)	71.2
	8	Douz	54.0
	9	Souk El Ahed	31,7
Médenine	10	Médenine (North and South)	126.0
	11	Ben Guerdane	92,0
	12	Djerba (Houmet Souk, Midoun)	161.6
	13	Zarzis	85,9
Tataouine	14	Tataouine (North and South)	107.0
Tozeur	15	Tozeur (Tozeur, Degache)	86.2

Source: JET

Apart from the size, the public transport mode (bus, BRT, metro, subway) most fitted to a city / group of cities or delegations will depend from the general shape of the city: dense, urban sprawl slopes, etc.

For public transport networks, the usual path to growth is as follows: existing bus network >> more buses and more new buses >> more clients >> necessity for additional buses and bigger buses (articulated-type in cities) >> dedicated bus lanes >> *BHNS/BRT* or *LRT* >> tramways (called “*métro*” in Tunisia) >> subway, tram-train and/or regional train (e.g. *RER* in France).

A better and more efficient public transport supply, helped by integrated management of the system with ITS (Intelligent Transport System) and financial incentives/facilities, will increase the number of users.

Several public transport companies operate under the umbrella of the ministry of Transport. Each one covers one or more governorates of South Tunisia:

Table 3.3-3 Bus companies in South Tunisia

Name	Governorates and cities
SNTRI <i>Société Nationale de Transport Interurbain</i>	All South Region (national level company) Continuity with SNCFT in Gabès rail station
SRT Gabès (Sotreg Ames)	Gabès, Kébili
SRT Gafsa (El Kawafel)	Gafsa, Tozeur
SRT Médenine.	Médenine, Tataouine

SRT : *Société régionale de transport*

This has to be considered in connection with the planned urban transport networks on the 2035 horizon:

Table 3.3-4 Urban transport networks in South Tunisia planned by 2035

Population in urban area (2035 horizon)	Cities / group of cities with planned transport networks
30,000 -50,000 inhabitants	Metlaoui, Sned, Souk El Ahed
50,000 -100,000 inhab.	Ben Guerdane, Douz, El Hamma, Kébili, Mareth, Tozeur, Zarzis
100,000 – 150,000 inhab.	Médenine, Tataouine
Over 150,000 inhab.	Gabès, Gafsa, Djerba

In order to maximize efficiency of the existing network and service quality to attract clientele, an operating structure at a regional, *délégation* or city level (*Autorité organisatrice des transports en commun*) should be created. It would be the driving force and support development of bus transport based on the demand of users, citizens and companies.

(3) Demand Forecast

(a) Roads: traffic volume and movement

The future road network of South Tunisia has been planned taking into consideration various hypotheses, including a hypothesis of evolution of traffic in the area which has been established thanks to a survey of the road network realized in February and September 2014 in various points of South Tunisia (8, including the entries of the ports of Gabès and Zarzis).

Annual average daily traffic (AADT) and traffic in 2014, 2025 and 2035 are forecast based on the present OD tables and future socio-economic conditions as shown in Figure 3.3-5, Figure 3.3-6 and Figure 3.3-7 on the next pages. The future traffic volume generated by /attracted to each governorate is estimated based on:

- Future population and economically active persons in the study area for passenger vehicles;
- Future production volume by type of goods and economically active persons in the study area for commercial vehicles.

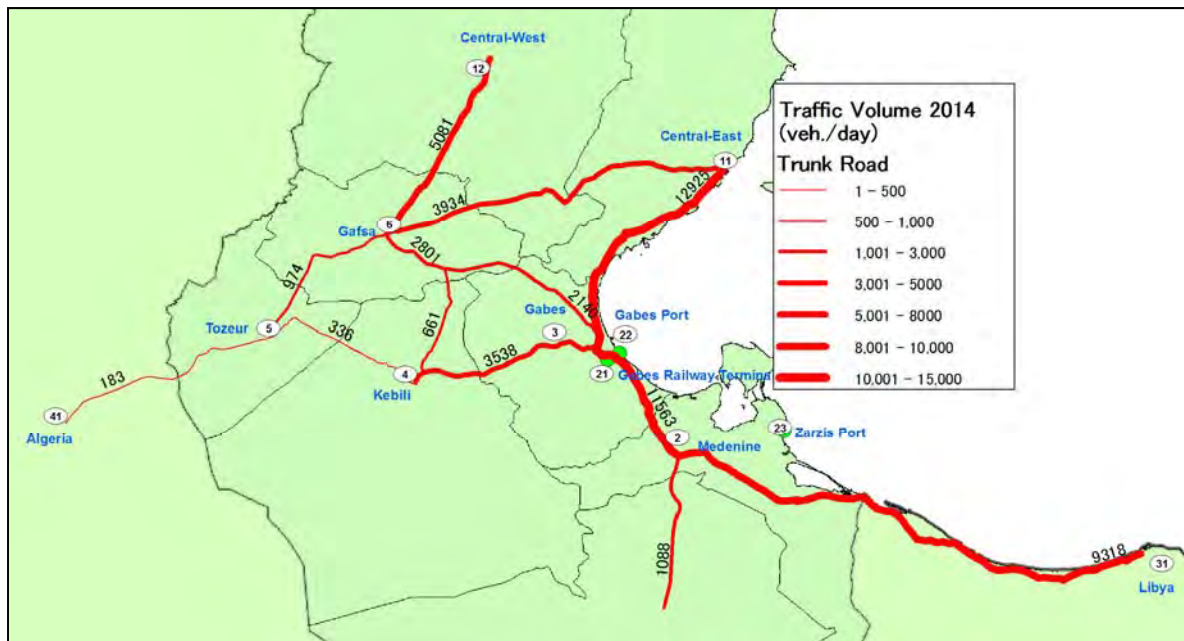
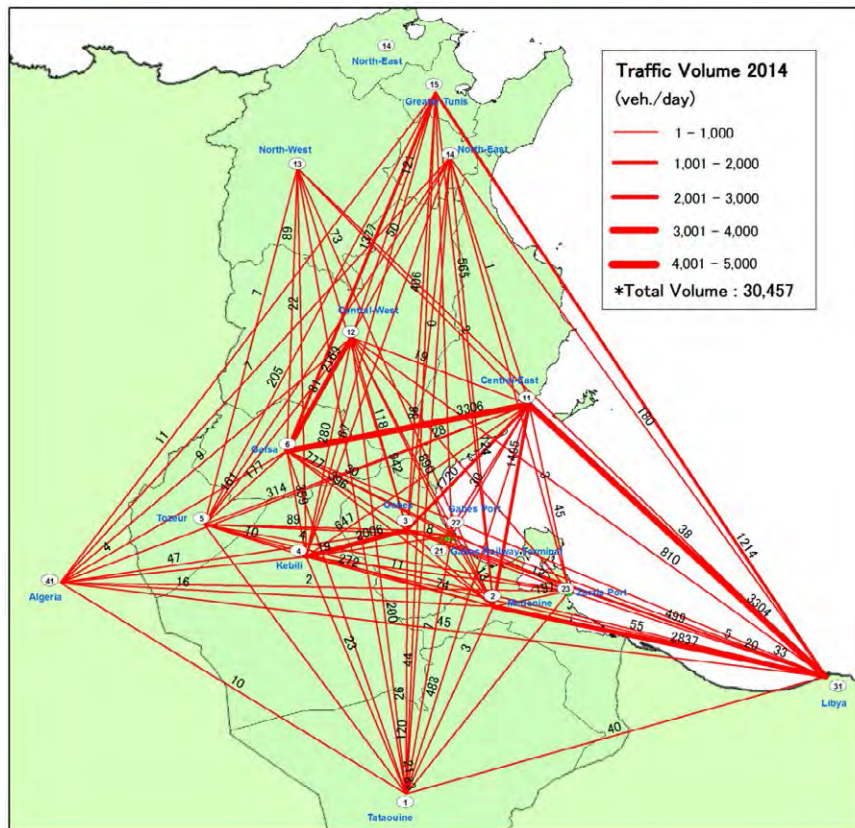
As for traffic distribution, the present pattern and methodology are applied since few major changes in road performance or to the road network which could cause a dramatic change in travel routes and times are predicted.

According to the forecast, the total numbers of vehicle trips generated by/attracted to the Southern Region, which are approximately 37,000 trips at present (cumulated intra- and inter-governorates trips), will be 45,000 trips in 2025 and 49,000 trips in 2035. The points to be considered for the future development strategy and plan are (1) over 4,000 vehicles between Gafsa and Sfax in 2035, (2) over 10,000 vehicles between Libya and Tunisia in 2035, and (3) relatively strong connections over 2,000 vehicles between Gabès and Kébili, and Gafsa and Central-West.

The point at present is to connect the new A1 highway with the surrounding region in South Tunisia. This is an ongoing issue dealt at present by Tunisie Autoroutes in connection with the Tunisian authorities.

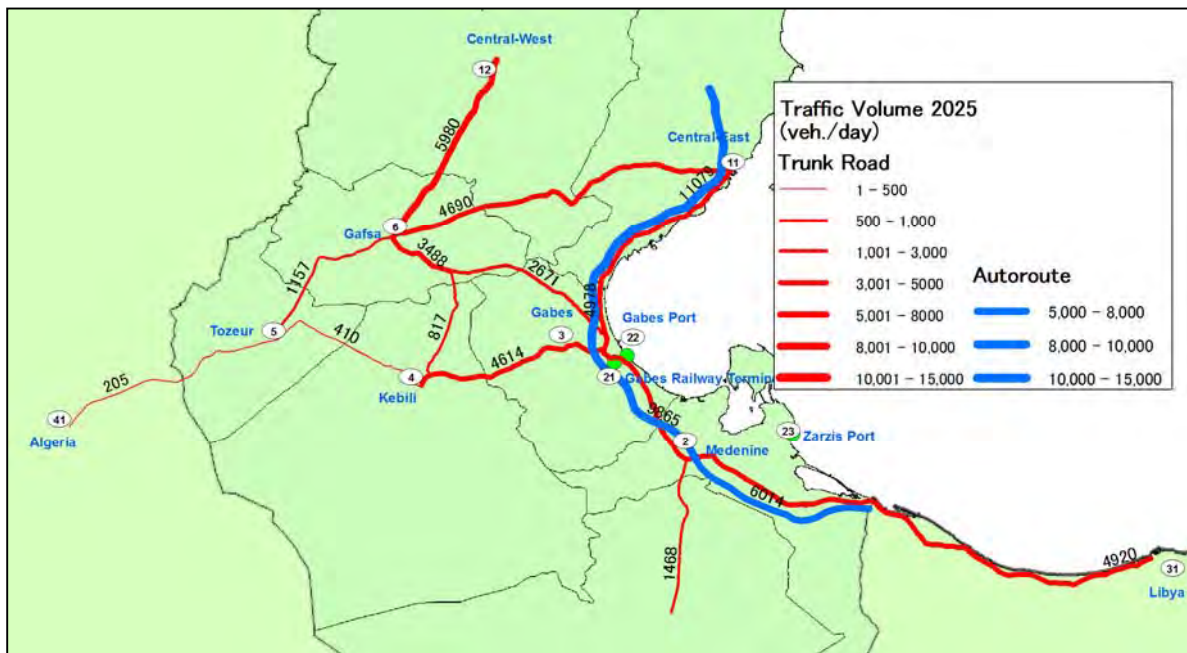
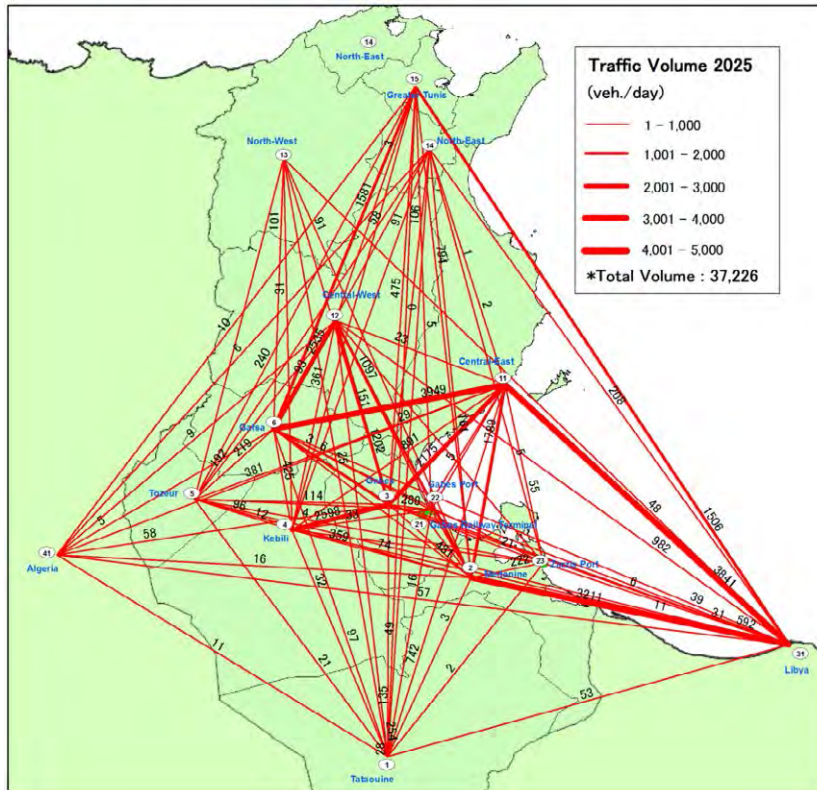
In addition, a study under EIB financing has just started and is ongoing (until December 2015). It tackles the issue of East-West corridors, road links from the governorates of Kasserine, Sidi Bouzid and Gafsa

to the governorates of Sfax and Gabès on the coast. This study should be followed by construction works.



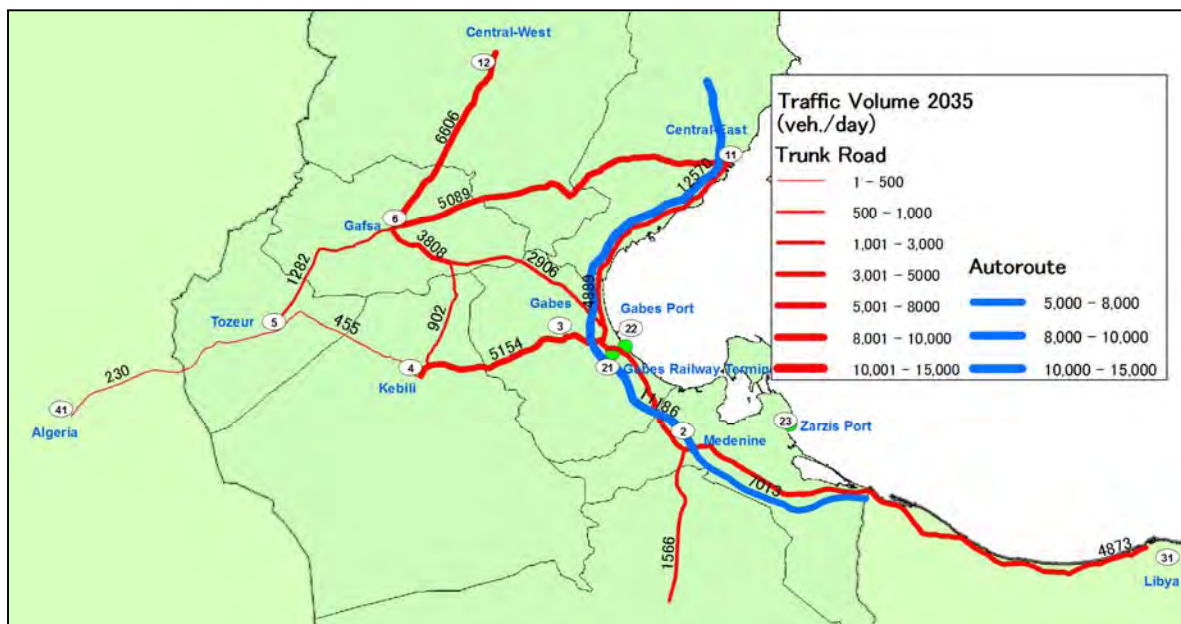
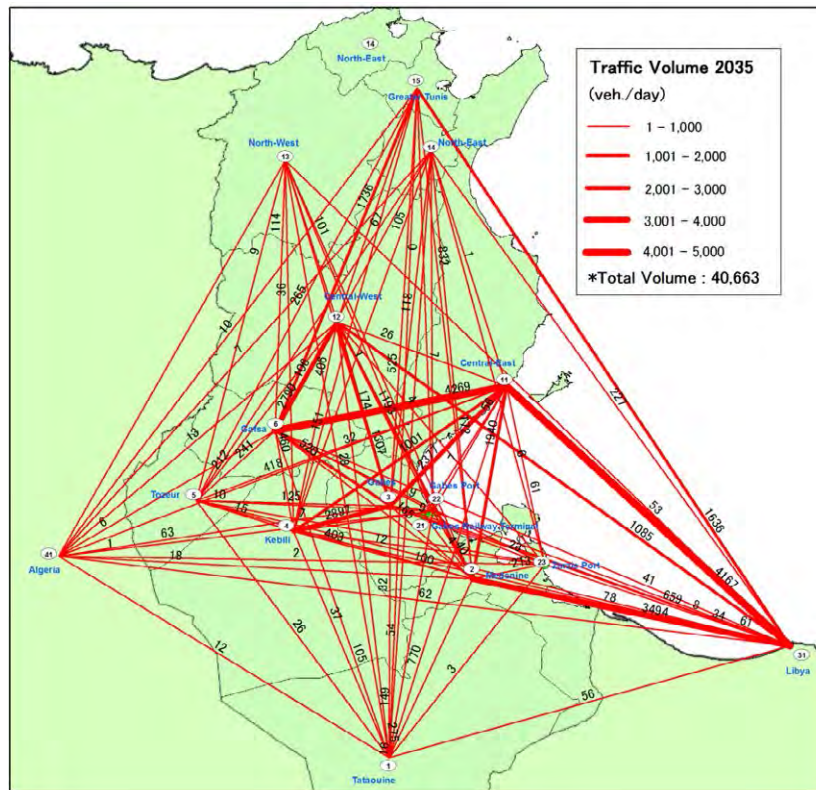
Source: JICA Expert Team

Figure 3.3-5 Present Traffic Demand in 2014 (veh./day)



Source: JICA Expert Team

Figure 3.3-6 Future Traffic Demand in 2025 (veh./day)



Source: JICA Expert Team

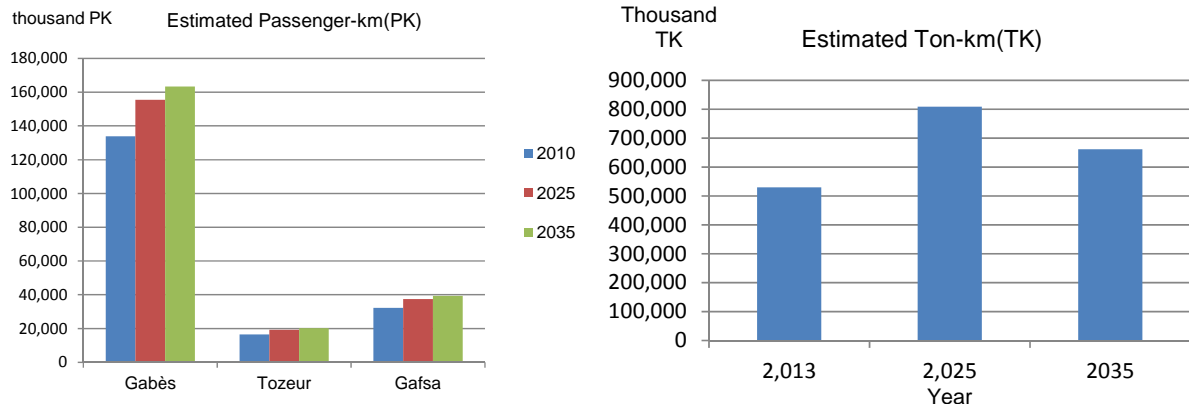
Figure 3.3-7 Future Traffic Demand in 2035 (veh./day)

(b) Number of passengers and amount of freight by railway

The future number of passengers in each railway station in 2025 and 2035 is forecast based on the growth of the population in each governorate where the stations are located. The annual growth rates applied are 1.0% per year until 2025 and 0.5% per year until 2035.

Regarding the future amount of freight, Ton-km (TK) of phosphate is forecast using the annual growth rate, which is 3.6 % per year, estimated in *Plan Directeur National des Transports* (National Transport

Plan) until 2025. After 2025, the production volume of phosphate is assumed to decline due to the depletion of resources. Figure 3.3-8 shows the estimated cumulative passenger-km by station and ton-km of phosphate, by year



Source: JET

Figure 3.3-8 Estimated cumulative passenger-km by station and ton-km of phosphate, by year

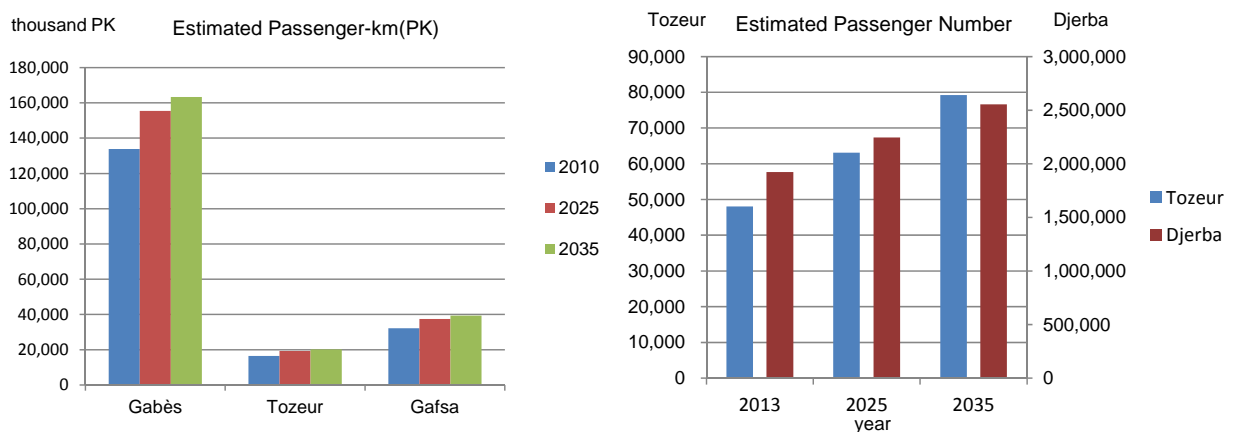
(c) Freight traffic in the Gabès port and in the Zarzis Port

The future transaction volumes of the Gabès and the Zarzis Port in 2025 and 2035 are forecast based on the growth rate shown in the *Plan Directeur National des Transports* because of unstable trends/ inconsistent data in recent years. The future freight volume of the Zarzis Port after 2025 is forecasted to realize more growth because of the growth of export volume of gypsum, limestone and marble. The annual growth rates applied are 2.3% per year for the Gabès Port and 1.3% per year until 2025 and 5.0 % per year after 2025 for the Zarzis Port.

(d) Passenger numbers in the Djerba airport and the Tozeur airport

The future number of passengers for the Djerba airport and the Tozeur airport in 2025 and 2035 are forecast based on the growth rate shown in the *Plan Directeur National des Transports* because of unstable/ inconsistent data in recent years.

The annual growth rates applied are 4.7% per year for Tozeur Airport and 3.5% per year for the Djerba airport. Figure 3.3-10 shows the estimated number of passengers in each airport in 2025 and 2035.



Source: JET

Figure 3.3-9 Estimated freight tonnage in ports

Figure 3.3-10 Estimated airport passengers

(4) PLANNING CONCEPT FOR THE DEVELOPMENT OF THE TRANSPORT SECTOR IN SOUTH TUNISIA

This part of the study will address the following issues:

(A) SCENARIOS FOR THE DEVELOPMENT OF TRANSPORT AND TRANSPORT INFRASTRUCTURE SECTORS

- 1) General presentation of transport development issues in South Tunisia
- 2) Transport of goods: main transport modes and routes in South Tunisia for productive sector
- 3) Transport of passengers: population in the delegations of South Tunisia on the horizon 2035
- 4) Sorting and classification of projects, by size

(B) THE FIVE SECTORIAL STRATEGIC THEMES (TR-1 TO TR-5) AND CORRESPONDING DEVELOPMENT MONITORING INDICATORS

- 1) Detailed presentation of each strategic theme and challenges (short term and mid-term)
(for each of the five strategic themes)
- 2) Development indicators

(C) PROPOSALS FOR PROJECTS IDENTIFIED IN THE TRANSPORT AND TRANSPORT INFRASTRUCTURE DOMAINS

- 1) List of the 41 proposals identified
- 2) Synoptic map of all projects in South Tunisia (status by year 2035);
- 3) Summary chart of implementation of the projects

(D) PLANNING OF IMPLEMENTATION OF THE PROJECTS

For each transport mode:

- Explanation of the development policy for the transport mode
- List of projects for the transport mode and (*tentative*) development scenario for each project (short-term, medium-term, long-term)
- Synthesis map to locate all corresponding projects in South Tunisia.
 - 1) Roads
 - 2) Railway
 - 3) Ports
 - 4) Airports
 - 5) Urban and interurban transport
 - 6) Transport facilities in urban areas
 - 7) General issues

This section will include a **specific focus on short term projects** (all sectors), due to the importance of their proper implementation at the starting phase of the development of the whole project, the correlated risks on the development of other projects in case of problems or delays, and the necessity to be in a position to manage them accordingly.

(E) ELEMENTS ON ESTIMATED COSTS OF THE PROJECTS

- 1) Elements of cost available during the study for similar projects
- 2) Summary of tentative cost estimates for the proposed projects (when available)

(F) DETAILED PRESENTATION OF EACH PROJECT (SORTED BY STRATEGIC THEMES)

(A) –SCENARIOS FOR THE DEVELOPMENT OF TRANSPORT AND TRANSPORT INFRASTRUCTURE SECTORS

1) General presentation of transport development issues in South Tunisia

In Tunisia, mobility and transport find their place at the highest level of public interest and political agenda, due to their crucial support to the industrial and economic life of the country, but also because of their crucial social importance, as providers of opportunities for school, jobs, health, work and leisure.

The Constitution of the Tunisian Republic, enacted January 26th, 2014, addresses transport related items:

(Article 5¹⁶): “The Republic of Tunisia is a part of the Arab Maghreb and shall work to achieve its unity and take all measures to ensure its realization“

>> The Trans-Maghreb railway project – South Tunisian part) should be considered in that perspective.

See corresponding proposal for project TR 1-3.

(Article 8): “Youth are an active force in building the homeland. The state shall provide the necessary conditions to develop the capacities of youth and realise their potential and strives to give them responsibility and expand their contribution to social, economic, cultural and political development.”

>> Going to school is a priority, going to school safely and on time is a necessity. Safe transport infrastructure and appropriate transport supply (network, vehicles and schedules) are necessary.

See proposals TR 2-3 and TR 2-4 for upgrading public transportation vehicles.

(Article 12): The state shall seek to achieve sound use of natural resources, balance between regions, social justice, and sustainable development, with reference to development indicators and in accordance with the principle of positive discrimination.

>> Southern Tunisia is considered to necessitate particular care on this point.

Measurement of evolution of development indicators is considered as integrated part in that scheme.

See proposal TR 3-2 for the creation of a monitoring and support structure.

(Article 131): Local government shall be based on decentralisation. Decentralisation shall be embodied in local authorities composed of municipalities, regions and governorates covering the entire territory of the Republic in accordance with a distribution set by law. Special categories of local authorities may be established by law.

>> This article concerns inter alia authorities in charge of organizing public transport.

See proposal TR 1-1 on empowerment of local authorities for issues related to public transport.

(Article 134): Local authorities shall enjoy autonomous powers, powers shared with the central government, and powers delegated to them from central government.

The joint and delegated powers shall be distributed in accordance with the principle of subsidiarity.

Local authorities shall enjoy regulatory power in exercising their mandates. Regulatory decisions of local authorities shall be published in the official gazettes of local authorities.

>> The decentralization and empowerment of local authorities is on the way.

This development study must take this issue of decentralisation into proper consideration (see proposal TR 1-1 on empowerment of local authorities for issues related to public transport).

¹⁶ Abstracts of English translation from:

http://www.jasmine-foundation.org/doc/unofficial_english_translation_of_tunisian_constitution_final_ed.pdf

2) Transport of goods: main transport modes and routes in South Tunisia for productive sector

The planning concept of transport sector should be considered to support the development of productive sector based on the development scenario and special development plan described in chapter 2.

JET proposes the development plans and their action plans after the following clause considering major transport modes and routes to be important for each productive sector. Table 3.3-5 shows the major transport modes and routes to be considered for the future development plans.

Table 3.3-5 Main transport modes and routes by productive sector

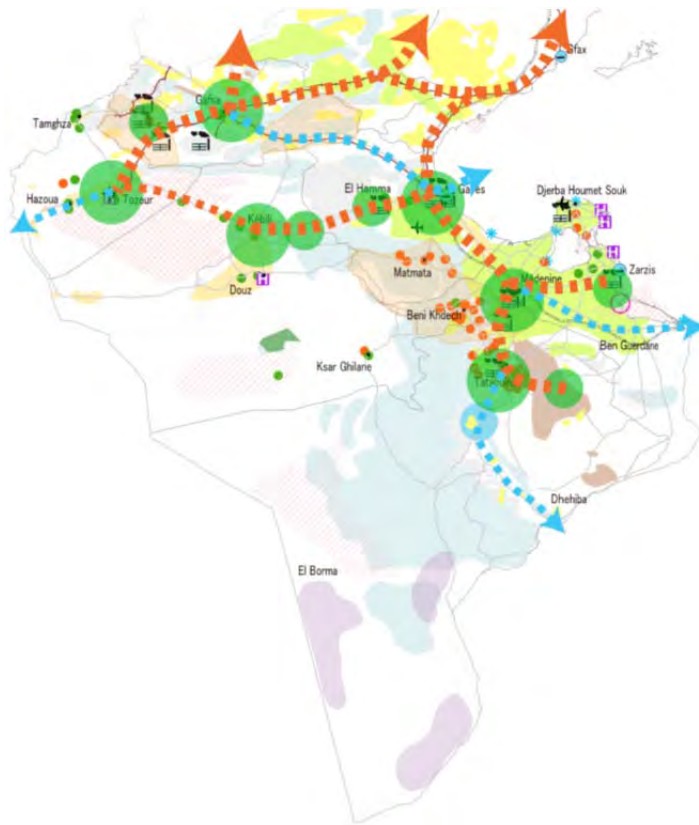
Productive sector	Main transport mode		Important transport route
	Internal	External	
Agriculture Fishery Livestock	Road	Road, Maritime	Coastal axis (Sfax-Gabès-Médenine-Libya) Tozeur-Gafsa-Sfax, Tozeur-Kébili-Gabès Tataouine-Médenine (Zarzis)-Libya
Mining Manufacturing	Railway, Road	Road, Maritime	Coastal axis (Sfax-Gabès-Médenine-Libya) Gafsa - Gabès, Algeria-Tozeur-Kébili-Gabès, Tataouine-Libya
Tourism	Road	Aviation	Djerba-Gabès-Gafsa-Tozeur- Tataouine-Médenine Internal: Douz -Zarzis-
“Just in time” (agriculture, industry, services)	Aviation	Aviation	Djerba-Gabès-Gafsa-Médenine- Tataouine- Tozeur

According to Chapter 2, the flow of most products will move towards North, especially Sfax, while the export to major markets is still managed in Sfax or northern Tunisia, even though the processing activities will gradually shift from the North to the South.

However, transportation from the Southern Region to the north of Tunisia will become secondary and be handled through the Médenine-Gabès-Zarzis logistic network as the Zarzis port becomes a regional central trading port in the long-term development stage.

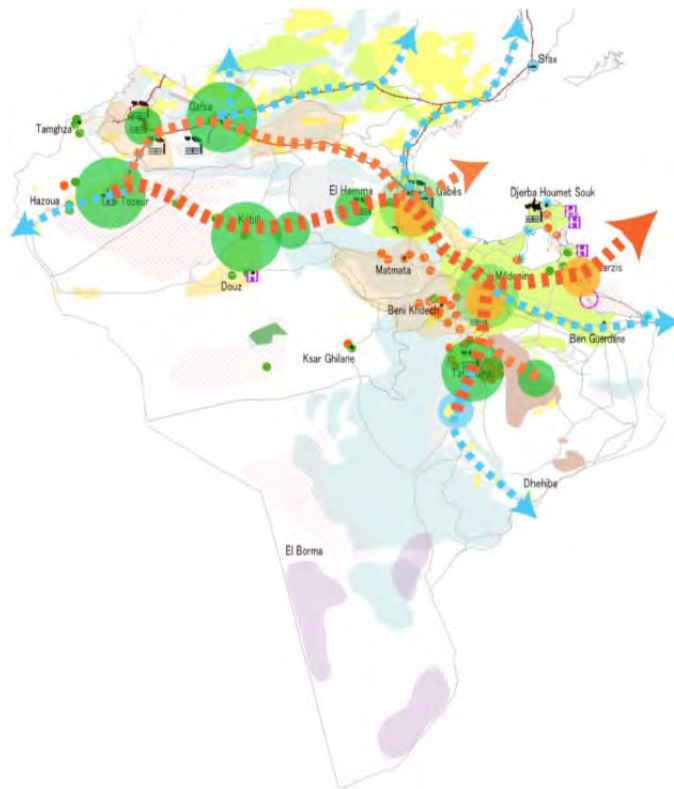
On the other hand, the trade with Libyan and Algerian markets will start increasing, according to the increase of the number of border posts in the region.

The figures Figure 3.3-11 and Figure 3.3-12 here after show the main transport routes during earlier and long-term stages of development in the Southern Region.



Source: JET

Figure 3.3-11 Main Transport Routes at earlier stage



Source: JET

Figure 3.3-12 Main Transport Routes at long-Term Stage

3) Transport of passengers: population in the delegations of South Tunisia on the horizon 2035

In addition to their support to the productive sector, transport infrastructures have a large variety of functions including a social role of link between people. In addition, many people want to have the possibility to live and work in their hometown (or at least to be in a position to commute daily to and from their workplace) and these considerations have also to be taken into account.

The development of infrastructure must therefore match the evolution of the population¹⁷. Five areas of influence have been determined accordingly in the region, three areas of major influence (below in pink) and other areas of medium influence (noted in blue in figure after)¹⁸:

- Major influence: Gafsa-Tozeur, Tataouine-Médenine, Coastal (Gabès, Djerba, Zarzis) ;
- Medium influence: Kébili-Douz, Ben Guerdane.

The other cities of South Tunisia must be efficiently connected to these poles/areas in order to form a performing network, which in turn will support the development of the whole economy of the region.

Note:

Border posts (actual, planned) are indicated on opposite figure with ● (or with ◐ when located outside of the study area).

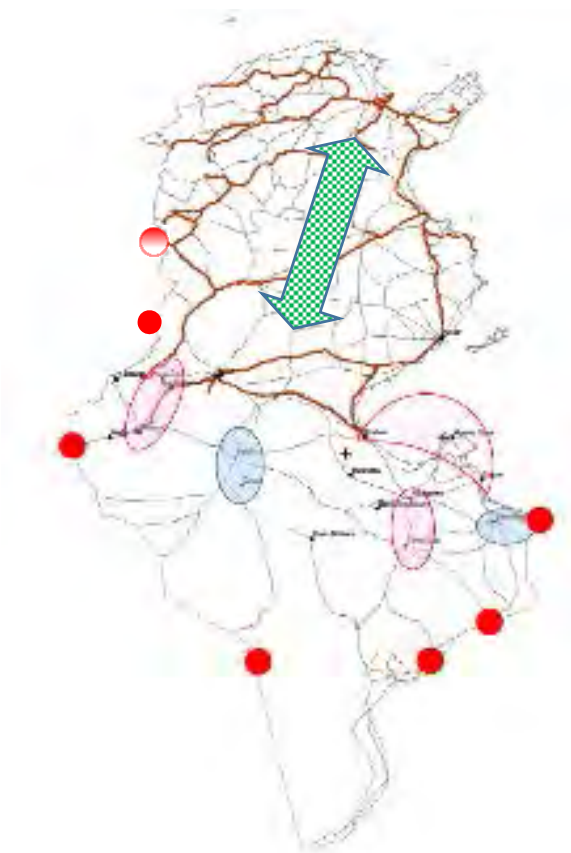


Figure-3.3-13 Areas of influence inside the study area (general)

¹⁷ The 2014 census indicated five additional cities in the study area of over 30,000 inhabitants in 2035: El Hamma, Mareth, Metlaoui, Sned, and Souk el Ahed.

¹⁸ The area of the city of Médenine is disconnected from the coastal area Djerba-Zarzis. The Djerba-Zarzis area will be connected more easily to the Gabès area if a bridge between Ajim and Jorf is constructed (see proposal for this project).

Table 3.3-6 Population in South Tunisia in 2014 and 2035 (estd.)

	Census 2004	Census 2014	New Projection 2035	2035/2014
51 Gabes	324,6	374,3	427,1	1,141
5151 Gabès Médina	47,1	46,7	52,8	1,129
5152 Gabès Ouest	28,4	31,8	36,3	1,143
5153 Gabès Sud	61,7	74,4	85,7	1,152
5154 Ghanouch	22,7	28,1	32,4	1,154
5155 El Métouia	25,9	27,9	31,7	1,139
5156 Menzel El Habib	11,5	10,1	11,3	1,116
5157 El Hamma	62,4	73,5	84,5	1,149
5158 Marmata	5,8	4,4	4,9	1,101
5159 Nouvelle Marmata	16,0	14,2	15,9	1,117
5160 Mareth	61,3	63,1	71,6	1,134
52 Médenine	432,5	479,5	551,2	1,149
5251 Médenine Nord	48,1	54,8	63,1	1,152
5252 Médenine Sud	48,1	54,6	62,9	1,152
5253 Beni Khedech	28,6	25,9	29,1	1,126
5254 Ben Guerdane	70,9	79,9	92,0	1,151
5255 Zarzis	73,5	75,4	85,9	1,140
5256 Djerba Houmat Souk	64,9	75,9	87,7	1,155
5257 Djerba Midoun	50,5	63,5	73,9	1,164
5258 Djerba Ajim	24,2	24,3	27,6	1,138
5259 Sidi Makhlouf	23,7	25,2	28,8	1,144
53 Tataouine	143,5	149,5	166,4	1,114
5351 Tataouine Nord	54,4	61,4	68,9	1,122
5352 Tataouine Sud	33,8	34,3	38,1	1,110
5353 Smar	13,8	14,8	16,5	1,116
5354 Bir Lahmar	9,3	8,5	9,3	1,098
5355 Ghomrassen	18,3	16,0	17,5	1,094
5356 Dhehiba	4,0	4,3	4,8	1,117
5357 Remada	10,0	10,2	11,3	1,111
61 Gafsa	323,7	337,3	376,0	1,115
6151 Gafsa Nord	9,4	10,0	11,2	1,117
6152 Sidi Aich	8,3	10,1	11,4	1,131
6153 El Ksar	32,2	36,5	41,0	1,123
6154 Gafsa Sud	90,7	101,1	113,5	1,122
6155 Oum El Araïes	31,7	27,0	29,5	1,092
6156 Redeyef	27,9	27,0	29,8	1,106
6157 Matlaoui	38,9	38,6	42,8	1,109
6158 M'dhila	14,8	15,3	17,0	1,113
6159 EL Guetar	19,9	20,1	22,4	1,111
6160 Belkhir	15,2	14,8	16,4	1,106
6161 Snad	34,5	36,7	41,0	1,117
62 Tozeur	97,5	107,9	123,9	1,148
6251 Tozeur	39,9	46,4	53,5	1,154
6252 Degach	26,6	28,5	32,7	1,144
6253 Tameghza	6,4	6,5	7,4	1,138
6254 Nefza	20,5	21,7	24,8	1,143
6255 Hazoua	4,2	4,7	5,4	1,149
63 Kébili	143,2	157,0	179,4	1,143
6351 Kébili Sud	28,0	30,4	34,8	1,142
6352 Kébili Nord	29,4	31,9	36,4	1,142
6353 Souk El Ahed	26,7	27,9	31,7	1,137
6354 Douz Nord	25,5	28,6	32,8	1,146
6355 Douz Sud	17,2	18,6	21,2	1,141
6356 Faouar	16,3	19,6	22,6	1,154

Source: Census INS 2014, estimate 2035 by JET

The variation of population in each delegation of the study area has been considered, especially concerning urban transport: in green in here above chart are the urban areas/delegations of more than 30,000 persons on the 2035 horizon, as per the growth hypothesis considered for the study. Several delegations can join in order to constitute a same urban transport area, hence an appropriate management structure to be created (see proposal for project TR-1-1).

It must be noted that most of the key players in the public Transport domain in Tunisia are State-owned companies, public offices or companies with a strong participation/involvement of the State¹⁹. This makes furthermore relevant the elaboration of a policy of development promoted and supported by the State (or by other public authorities), with public guidance and public-owned structures involved.

4) Sorting and classification of the projects

The projects for transport infrastructures have been sorted by size and function, in order to visualize more easily the role and importance of each evolution considered. Each proposed project is relevant/appropriate at the corresponding level, from creation of roundabouts and city transport to international travel connections.

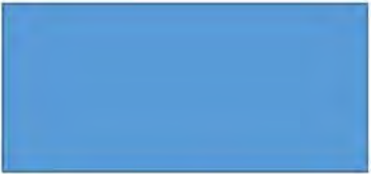

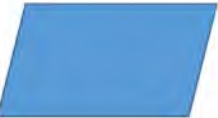




	<p>Global:</p> <p>Cape Canaveral Eiffel Tower</p>
	<p>International:</p> <p>UMA Border posts</p>
	<p>National:</p> <p>National road safety policy Transport trunk network</p>
	<p>Regional (Inter-Governorates):</p> <p>Interurban transport network</p>
	<p>Governorate:</p> <p>Local road network Logistical and handicraft centers</p>
	<p>Delegation:</p> <p>Public transport network</p>
	<p>City:</p> <p>City bypasses - Flyovers Improvement of sidewalks</p>

Figure 3.3-14 Categorization of the areas of influence of projects

¹⁹ The legal organization of transports in Tunisia is now based on the Law 2004-33 “Loi portant organisation des transports terrestres” Law on the organization of Land Transport”.

(B) –THE FIVE SECTORIAL STRATEGIC THEMES TR-1 TO TR-5 AND CORRESPONDING DEVELOPMENT MONITORING INDICATORS

1) The five strategic themes and their challenges (short term and mid-term)

Based on current issues and the result of demand forecasts, the following five strategies are proposed in order to develop the transport sector in interaction with other productive sectors in the Southern Region.

Table 3.3-7 Transport Strategies for the Development of the Southern Region

Code	Strategy	Effect (Direct / Indirect)			Indicator
		Value-added	Job creation	Sustainability	
TR-1	Increase the possibilities of mobility: upgrade accessibility to major cities in Tunisia and neighbouring countries and increase intra-governorate traffic	Reduction of transportation time and cost	General improvement of business situation to facilitate the activities of companies and citizens	Reduction of CO ₂ and exhaust gas emissions	<ul style="list-style-type: none"> • Transportation time • Passengers-km and Ton-km of freight • Waiting times in congestion spots in urban areas • Pavement ratio of rural roads
TR-2	Increase the intensity of mobility: Enhance the capacity and the service quality of all transport modes	Activation of economy by increase of external trade and public transportation users	Creation of jobs, e.g. drivers	Improvement of markets, sales and jobs stability	<ul style="list-style-type: none"> • No. of passengers of public transport • Rail, road, port and air traffic (freight, passengers)
TR-3	Increase the sustainability of mobility: Establishment and reinforcement of infrastructure operation and maintenance (OEM) systems	Reduction of maintenance costs	Creation of sustainable skilled jobs specialized in maintenance	Maximize the operational life of infrastructure	<ul style="list-style-type: none"> • Roughness index (flatness) • Number of overloaded trucks on the roads
TR-4	Increase the safety/eco-friendliness of mobility: Consideration of the traffic safety and environment	Enhancement of local amenities	Enhancement of staff capacity Job creation in the environment domain	Mitigation of pollution due to transport	<ul style="list-style-type: none"> • Traffic casualties • Traffic accidents • Pollutants discharged into sea from ports • Emissions of CO₂
TR-5	Support the production sector, towards international industries and services	Activation of local and national economy	Generating demand for staff, materials and equipment	Induce effects to local economy	<ul style="list-style-type: none"> • Number, extent and use of logistical areas • External trade volume • Number of international passengers by air

Source: JET

(a) Strategy TR-1: Increase the Possibilities of Mobility

(i) Objective of the strategy

The objective of the strategy TR-1 is to upgrade the accessibility of transport infrastructure in the Southern Region to and from major cities in Tunisia and neighbouring countries as well as to increase the intra-governorate traffic. This covers the following aspects:

- Creation of new infrastructure;
- Improvement of existing infrastructure;
- Resolution of bottlenecks.

This strategy includes both general infrastructure and city infrastructure in order to tackle the issues related to congestion.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Reduction of transportation time and costs;
- 2) General improvement of economic climate to facilitate activities of companies and citizens: new infrastructure will smoothen transport and trade conditions and have a favourable effect for employment, both direct during the construction period and also for operation and maintenance (O&M): necessity of (qualified) staff to operate (e.g. airport), necessity to adequately maintain the investments, increased and smoothened possibilities to commute;
- 3) Reduction of CO₂ and exhaust gas emissions;
- 4) Enhancement of competitiveness among each transport mode, as the result of the improvements brought to public service.

(iii) Indicators

In order to measure the success/result of the strategy, the following indicators are proposed:

- 1) Travel time;
- 2) Passengers-km and Ton-km of freight;
- 3) Waiting time in congestion spots in urban areas;
- 4) Pavement ratio of rural roads.

(iv) Development Plan

< Institutional and human capacity development plan >

Short term (2015-2020):

Empowerment of local authorities for issues related to public transport.

In conjunction:

- Review of the current operation plan for public transport (network and timetable, etc.);
- Integrated management of lines and tariff facilities for bus transport (for example, commuter access to the whole network with time-based tariffs instead of connection-based tariffs);
- Increase in the number of inter-city buses (see also strategy TR-2).

Mid-term (2020-2025):

Empowerment of local authorities for issues related to public transport (continuous training and monitoring).

< Facility and infrastructure development plan >

The strategy TR-1 will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Development of new routes (paved or unpaved);
- Trans-Maghreb railway project Study;
- Rail link from Tataouine to the Zarzis port (studies);
- Gabès – Light Rail Transport system (LRT, called in Tunisia “*métro*”) (studies);
- Gafsa – TCSP dedicated bus lanes (BRT/BHNS type in future) (studies);
- Construction of ring roads and detour roads;
- Development of an airport in Tataouine governorate (preliminary studies);
- Construction of 2x2 lanes bridge between Jorf and Ajim (studies).

Mid-term (2020-2025):

- Development of new routes (paved or unpaved) (contd.);
- Development of high-speed Trans-Maghreb railway on the most frequented sections (Libya border-Gabès-Tunis) (pending on results of study. See also study in Strategy TR-3);
- Study of a tram-train system between Gabès and El Hamma;
- Rail link from Tataouine to the Zarzis port (construction) (if high export demand of gypsum);
- Gabès – Light Rail Transport system (LRT, called in Tunisia “*métro*”) - Construction (start);
- Gafsa – TCSP dedicated bus lanes (BRT/BHNS type in future) (construction);
- Construction of ring roads and detour roads (contd.);
- Development of an airport in Tataouine governorate – Construction (medium to long term);
- Construction of a 2x2 lanes bridge between Jorf and Ajim (construction);
- Two urban bridges in Gabès city – First bridge (studies/construction).

< Financial and investment plan >

The strategy TR-1 will be realized through implementing following financial and investment plan:

Short term (2015-2020):

- Establishment of short term and annual financial plans that consider the state budget and donor funding;

Mid-term (2020-2025):

- Establishment of a long-term financial plan considering the state budget, donor funding and PPP.

(b) Strategy TR-2: Increase the intensity of mobility

(i) Objective of the strategy

The objective of the strategy TR-2 is to enhance the capacity and the service quality of all transport

modes. For example, highways with improved links to their surroundings in order to attract cars and trucks, high capacity trains for passengers and freight that travel at appropriate speeds, and facilities for transportation such as storage spaces for containers and logistic parks.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and social and environmental sustainability:

- 1) Activation of economy by increasing external trade and public transportation users;
- 2) Creation of jobs, e.g. drivers;
- 3) Improvement of markets, sales and jobs stability.

(iii) Indicators

In order to measure the result and success of the strategy, the following indicators are proposed:

- 1) Number of passengers using public transport;
- 2) Road, rail, port and air transport traffic (freight, passengers).

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy TR-2 will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

Mid-term (2020-2025):

< Facility and infrastructure development plan >

The strategy TR-2 will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Creation of *voies express*” express roads by widening roads to 2x2 lanes;
- Program for the suppression of bottlenecks;
- Improving the quality of vehicles of the public transport companies;
- Replacement of old SNCFT wagons by new ones and audit of the locomotives;
- Replacement of the 1980’s train carriages by new ones;
- Improvement of the interconnection between different transport modes. For example, between bus and among bus and *louage* cars, bus and train;
- Installation of cranes for container handling in each harbour.

Mid-term (2020-2025):

- Creation of *voies express*” express roads by widening roads to 2x2 lanes (continued);
- Program for the suppression of bottlenecks (continued);
- Improving the quality of vehicles of the public transport companies (continued);
- Replacement of old SNCFT wagons (continued).

< Financial and investment plan >

The strategy TR-2 will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Establishment of short term and annual financial plans considering the state budget and donor funding;
- Other main roads – Continuous improvement via creation of a Fund.

Mid-term (2020-2025):

- Establishment of long-term financial plan considering the state budget, donor funding and PPP.

(c) Strategy TR-3: Increase the sustainability of mobility

(i) Objective of the strategy

The objective of the strategy TR-3 is to establish and reinforce the infrastructure operation and maintenance (OEM) systems in order to enhance the lifespan of all infrastructures. This strategy can maximize the quality and the effectiveness of the investment, whilst minimizing maintenance costs and pollution.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on local economy and social and environmental sustainability:

- 1) Increase of capacity of state-owned corporations that operate public transport;
- 2) Reduction of maintenance costs;
- 3) Creation of sustainable, skilled jobs specialized in maintenance;
- 4) Maximize the operational life of infrastructure.

(iii) Indicators

In order to measure the result and success of the strategy, the following indicators are proposed:

- 1) Roughness index (IRI) ;
- 2) Number of overloaded trucks on the roads.

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy TR-3 will be realized through implementing following institutional and human capacity development plan:

Short term (2015-2020):

- General accounting principles for public entities regarding public transport
- “*Mission des infrastructures de Transport du Sud tunisien*” (South Tunisia Transport Taskforce or S3T) will be created by ODS, Ministry of Equipment and Ministry of Transport in order to handle with the following tasks:

- Establishment and update of a regional transport infrastructure master plan;
- Analysis regarding cross-border traffic and links with North Tunisia;
- Monitor and follow-up the program for resorption of bottlenecks in cities.

Within this Taskforce/Mission, a monitoring entity (*Observatoire économique et statistique des transports du Sud tunisien*, Economic and Statistical Observatory for Transport of South Tunisia) will be in charge of collecting, storing and publishing the various traffic data in order to ensure proper follow-up to policies and to detect possible improvements.

Its organizational structure will be based inside ODS in Médenine. Its staff will receive specific training and participate in international programs or exchange systems with other countries.

Taking advantage of its expertise (by its membership, by its daily work) and of its position at the crossing point of first-hand transport related information in the area, S3T can then be an appropriate and efficient counterpart for the entities in the domain: *Tunisie Autoroutes*, SNTRI, SRT, SNCFT...

In turn, with a counterpart having lots of updated information, knowledge and contacts locally in the domain, these entities will be in a position to improve and facilitate the delivery of their services, thus improving their own overall performance (a simple example: quick processing of requests for moving a bus stop or modifying a bus schedule).

Regular contacts are key on this issue in order to foster mutually profitable cooperation.

Necessary information will be collected and the Mission will be created during this period. A database will be created and studies undertaken.

Mid-term (2020-2025):

- General accounting principles for public entities regarding public transport (continued, continuous training of the staff)
- “*Mission des infrastructures de Transport du Sud tunisien*” (South Tunisia Transport Taskforce, or S3T) continues: the Mission operates on a sustainable manner, financed by ODS
- Publication of an annual bulletin summarizing the present transport conditions and the long-term vision for economic development;
(ODS will be the facilitator of these activities).

< Facility and infrastructure development plan >

The strategy TR-3 will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Census of existing transport studies and creation of a compiled transport development master plan in South Tunisia;
- Development routes (paved and unpaved): Part 2: maintenance and improvement;
- ITS system for roads and road database;
- Comprehensive information system for public transport by bus;
- Study of rail transport network for passengers/freight in South Tunisia;

- Traffic and parking master plan program;
- Study of rail transport network for passengers and freight in South Tunisia.

Mid-term (2020-2025):

- Development routes (paved and unpaved): Part 2: maintenance and improvement (continued);
- Development of the rail network pending on the results of the study of “rail transport network for passengers/freight in South Tunisia” (construction, extension of line, rehabilitation);
- Traffic and parking master plan program (finishing the program).

< Financial and investment plan >

The strategy TR-3 will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Establishment of a Fund for road improvement outside cities (road maintenance fund);
- Establishment of a Fund for streets improvement of city streets.

Mid-term (2020-2025):

- Road maintenance Fund and city streets improvement Fund will be secured, for instance from a fuel levy and taxes related to vehicles paid by road users. Budget for road maintenance should be preferably allocated to dangerous accidents black spots where there has been a lethal accident;
- Funding dedicated to road safety should be equal to 10% of the investments in the road sector according to the recommendations on the study of the African Development Bank on the strategy for road safety in Tunisia on September 2013;
- Roadside environment maintenance can be partly financed by this policy such as cleaning of roadside, planting trees on footpaths, ensuring appropriate widths of the footpath and periodic maintenance for the visibility of road signs in accordance with road safety requirements.

(d) Strategy TR-4: Increase the safety/eco-friendliness of mobility

(i) Objective of the strategy

The objective of the strategy TR-4 is consideration for traffic safety and the environment. Sustainable development cannot be reached with numerous road traffic deaths or injuries and while harming the environment. This is an overarching issue that 267 persons have been killed in road accidents in 2012 in the 6 governorates of the Southern Region, which represents 16.5% of the total deaths in lethal accidents in Tunisia, compared with a proportion of the total national population that live in South Tunisia which is 14.7%. Hence, this strategy is vital and actions implemented accordingly will bring in positive effects.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and on social and environmental sustainability:

1) Enhancement of local amenity:

Consideration for safety and environment will lead to enhancement of local amenity and tourism by achieving better relief of users and better landscapes.

2) Improvement of staff capacity:

Consideration for road safety will have indirect benefit for the health of habitants, capacity building for the police, road administrators, road safety experts and other stakeholders of road projects;

3) Job creation in the environment domain;

Consideration for environment will facilitate the recruitment and training of monitoring jobs in the environment sector such as for noise, CO₂ and other pollutants;

4) Mitigation of pollution due to transport.

(iii) Indicators

In order to measure the effect and impact of the strategy, following indicators are proposed:

- 1) Traffic casualties ;
- 2) Number of traffic accidents;
- 3) Pollutants discharged into the sea from ports;
- 4) Emissions of CO₂.

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy TR-4 will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

- Detailed investigation for lethal road accidents in South Tunisia;
Conducting a baseline survey of traffic accidents, accident black spots and the environment conditions;

Mid-term (2020-2025):

- The development of a plan regarding road safety should be determined in connection with the national-level study being undertaken by the National Observatory for Road Safety (ONSR) under AfDB financing. One can propose the setting up of a “React/Réagir” type policy (France, *réagir par des enquêtes sur les accidents graves et des initiatives pour y remédier*, launched in 1982), which conducts a detailed investigation for each lethal accident. One staff of DRE or DRT proper training for technical and psychological issues, should be dedicated to this issue;
- Creation of a training centre for traffic police, road and environmental administrators and other stakeholders in road safety domain;
- Establishment and enforcement of exhaust gas regulation ;
- Establishment of a plan to eliminate traffic accidents black spots. The parameters used to determine these points will be determined in the scheme of the National Road Safety Strategy (NRSS, in French *stratégie nationale de sécurité routière SNSR*)."

< Facility and infrastructure development plan >

The strategy TR-4 will be realized through implementing following facility and infrastructure development plan:

Short term (2015-2020):

- Continuous improvement of the tourist roads;

- Refurbishment of inter-urban bus stations (*gares routières*) in the six governorates;
- Program for the refurbishment / development of SNCFT stations.

The renovation of stations can be key to success and attractiveness of public transport. Existing stations need to be renovated or refurbished to provide better services under the supervision of the Regional Directorate for Transports (DRT) or of transport authority, if created. In that scheme, database, timetables and information panels should be created in the stations and on websites.

Mid-term (2020-2025):

- Continuous improvement of tourist roads;
- Program for the refurbishment / development of SNCFT stations (finalization).

< Financial and investment plan >

The strategy will be realized through implementing following financial and investment plan:

Short term (2015-2020):

- Special Fund to finance projects and activities related to road safety.
 - Examination of monetary loss due to the traffic accidents and pollution

Mid-term (2020-2025):

- Special Fund to finance projects and activities related to road safety.
 - Assessment and management of monetary loss due to the traffic accident and pollution

(e) Strategy TR-5: Support the production sector

(i) Objective of the strategy

The objective of the strategy TR-5 is to support the productive sector, in particular towards international industries and services, in order to activate local and national economy. All investments in the sector will be screened and prioritized based on their potential benefit to the economic development.

(ii) Direct/Indirect Effect

The strategy aims to have the following direct and/or indirect effect on the local economy and on social and environmental sustainability:

- 1) Activation of local and national economy;
- 2) Generation of demand for staff, materials and equipment during the period of construction as well as operation and maintenance;
- 3) Induce effects to local economy.

Once constructed, the infrastructure itself can induce effects to the local economy due to its inherent consumption, both during construction and operation, and to the development of related activities. Infrastructure (roads, railways, ports, airports) are actors and stakeholders in the sustainable development of the economy.

In addition to their participation in the economic development in the Southern Region, the improved infrastructure will bring in a better distribution of the North-South traffic and reduce the number of commercial vehicles from the Southern Region towards the Radès Port, quite saturated at present. It will

also reduce the related risk of accidents and pollution in the North and increase the availability of trucks in the Southern Region.

(iii) Indicators

In order to measure the effect and impact of the strategy, following indicators are proposed:

- 1) Number, extent and use of logistical areas;
- 2) External trade volume;
- 3) Number of international airline passengers.

(iv) Development Plan

< Institutional and human capacity development plan >

The strategy TR-5 will be realized through implementing the following institutional and human capacity development plan:

Short term (2015-2020):

- Enforcement of regulations in the transport sector (all modes):
 - Holding training sessions for road maintenance and axle load control;
 - Technical inspection (*contrôle Technique*). The *Agence Technique des Transports Terrestres* (ATTT), a public body under the Ministry of Transport will be in charge of training and the Observatory in charge of monitoring;
 - Capacity building for traffic police, road administrators and other stakeholders;
 - Installation of weigh bridges at border posts, national roads and ports;
 - There should be at least two teams of technicians and police in each governorate to operate the weighbridge;
 - Establishment of a traffic management and control plan.

Mid-term (2020-2025):

- Enforcement of the regulations in transport sector (all modes) (continued and improved).

< Facility and infrastructure development plan >

The strategy TR-5 will be realized through implementing the following facility and infrastructure development plan:

Short term (2015-2020):

- Improving the facilities of the public transport companies;
- Renewing *louage* vehicles;
- Development of the Gabès Port;
- Development of the Zarzis Port;
- Development of freight transport by plane in South Tunisia;
- Program for the development of logistics centres (study on all South Tunisia);
- Opening of additional border posts and improvement of existing ones (in coordination with the Directorate General for Douanes);
- Elaboration of a structured development scenario for the Djerba island;
- Structured development scenario for infrastructure in Kébili governorate.

Mid-term (2020-2025):

- Renewing *louage* vehicles (continued);
- Realization of intermodal freight transport by combining different transport modes;
- Development of the Gabès Port (continued);
- Development of the Zarzis Port (continued);
- Program for the development of logistics centres – Development will be based on the results of the study (e.g. construction of dry port/inland depot in landlocked areas);
- Opening of additional border posts and improvement of existing ones ;
- Elaboration of a structured development scenario for the Djerba island;
- Structured development scenario for infrastructure in Kébili governorate.

< Financial and investment plan >

The strategy will be realized through implementing the following financial and investment plan:

Short term (2015-2020):

- Establishment a of long-term financial plan considering the state budget, donor funding and PPP;

Mid-term (2020-2025):

- Establishment of a long-term financial plan considering the state budget, the donor funding and PPP ;
- The long-term financial plan should coordinate with the economic development plan and include other productive sectors.

2) Development indicators

Indicators of development for TR-1 to TR-5 are summarized in the following chart:

Table 3.3-8 Indicators

Strategic theme		Indicators	Baseline data (when available)
TR-1	Increase the possibilities of mobility	Transportation time	Routes to be selected
		Passengers-km and Ton-km of freight	To be gathered by S3T (see proposal for project TR 3-2.)
		Waiting times in congestion spots in urban areas	Locations to be selected
		Pavement ratio of rural roads	32.4% in Tataouine Governorate (Figure 3.3-3, page 3-200)
TR-2	Increase the intensity of mobility	No. of passengers of public transport	50,000 on liaison buses to SNCFT stations and trains
		Rail, road, port and air traffic (freight, passengers)	To be gathered by S3T (see proposal for project TR 3.2.)
TR-3	Increase the sustainability of mobility	Roughness index (IRI)	Road by road
		Number of overloaded trucks on the roads	No enforcement >> no information available> To be measured
TR-4	Increase the safety/eco-friendliness of mobility	Traffic casualties	Figure 3.3-4, page 3-201
		Traffic accidents	Figure 3.3-4, page 3-201
		Pollutants discharged into sea from ports	See environment section
		Emissions of CO2	See environment section
TR-5	Support the production sector	Number, extent and use of logistical areas	Not at present
		External trade volume	See industry section
		Number of international passengers by air	Djerba: 1,952,176 (2014), Tozeur: 34,278 (2014) (Table 3.3-1, page 3-203)

Source: JET

(C) PROPOSALS FOR PROJECTS IDENTIFIED IN THE TRANSPORT AND TRANSPORT INFRASTRUCTURE DOMAINS

1) List of the 41 proposals identified

The complete list of the proposed projects, sorted by strategic theme, is presented in Table 3.3-9:

Table 3.3-9 Cumulative list of proposals for projects sorted by strategic theme and project code

Project code	Title of proposal
Strategic theme TR-1: Increase the possibilities of mobility	
TR 1-1	Empowerment of local authorities for issues related to public transport
TR 1-2	Road network development (paved and unpaved roads), Part 1: New road construction
TR-1-3	Trans Maghreb railway project study (Passengers/freight).
TR-1-4	Study of a tram-train system between Gabès and El Hamma
TR-1-5	Rail link from Northern Tataouine to the Zarzis port
TR-1-6	Gabès - Light rail transport system (LRT, called in Tunisia "métro")
TR-1-7	Gafsa – TCSP dedicated bus lanes (BRT/BHNS type in future)
TR-1-8	Construction of ring roads and detour roads
TR-1-9	Development of an airport in Tataouine governorate
TR-1-10	Construction of a 2x2 lanes bridge between Jorf and Ajim
TR-1-11	Two urban bridges in Gabès city
Strategic theme TR-2: Increase the intensity of mobility	
TR-2-1	Creation of <i>Voies Express</i> (express roads) by widening roads to 2x2 lanes
TR-2-2	Program for the suppression of bottlenecks
TR-2-3	Improving the quality of vehicles of public transport companies
TR-2-4	Replacement of old SNCFT passengers wagons and audit of the locomotives
TR-2-5	Other main roads - Continuous improvement via the creation of a Fund
Strategic theme TR-3: Increase the sustainability of mobility	
TR-3-1	General accounting principles for public entities regarding public transport
TR-3-2	<i>Mission des Transports du Sud tunisien / South Tunisia Transport Taskforce (S3T)</i>
TR-3-3	Census of existing transport studies and Creation of a compiled transport development master plan in South Tunisia.
TR-3-4	Road network development (paved and unpaved roads), Part 2: Maintenance and improvement

Project code	Title of proposal
TR-3-5	ITS system ²⁰ for roads and road database
TR-3-6	Comprehensive information system for public transport by bus
TR-3-7	Study of rail transport network for passengers/ freight in South Tunisia
TR-3-8	Traffic and parking master plan program (<i>programme de plans de circulation et de stationnement</i>)
TR-3-9	Fund for roads improvement outside cities
TR-3-10	Fund for streets improvement in cities
Strategic theme TR-4: Increase the safety/eco-friendliness of mobility	
TR-4-1	Detailed investigations for lethal road accidents in South Tunisia
TR-4-2	Continuous improvement of tourist roads
TR-4-3	Refurbishment of the inter-urban bus stations (<i>gares routières</i>) in the six governorates
TR-4-4	Program for the refurbishment/ development of SNCFT stations
TR-4-5	Special Fund to finance projects and activities related to road safety
Strategic theme TR-5: Support the production sector	
TR-5-1	Enforcement of regulations in the transport sector (all modes)
TR-5-2	Improving the facilities of the public transport companies
TR-5-3	Renewing <i>louage</i> vehicles
TR-5-4	Development of the Gabès port
TR-5-5	Development of the Zarzis port
TR-5-6	Development of freight transport by plane in South Tunisia
TR-5-7	Program for the development of logistics centres
TR-5-8	Opening of additional border posts and improvement of existing ones
TR-5-9	Elaboration of structured development scenarios for public transport in the Djerba Island
TR 5-10	Structured development scenarios for the infrastructure in Kébili governorate

²⁰ ITS : Intelligent Transport System, in French *Systèmes de Transport intelligent* (STI)

2) Synoptic map of the transport projects in South Tunisia by year 2035

By year 2035, the implementation of all proposed projects could correspond to the synoptic map here after:

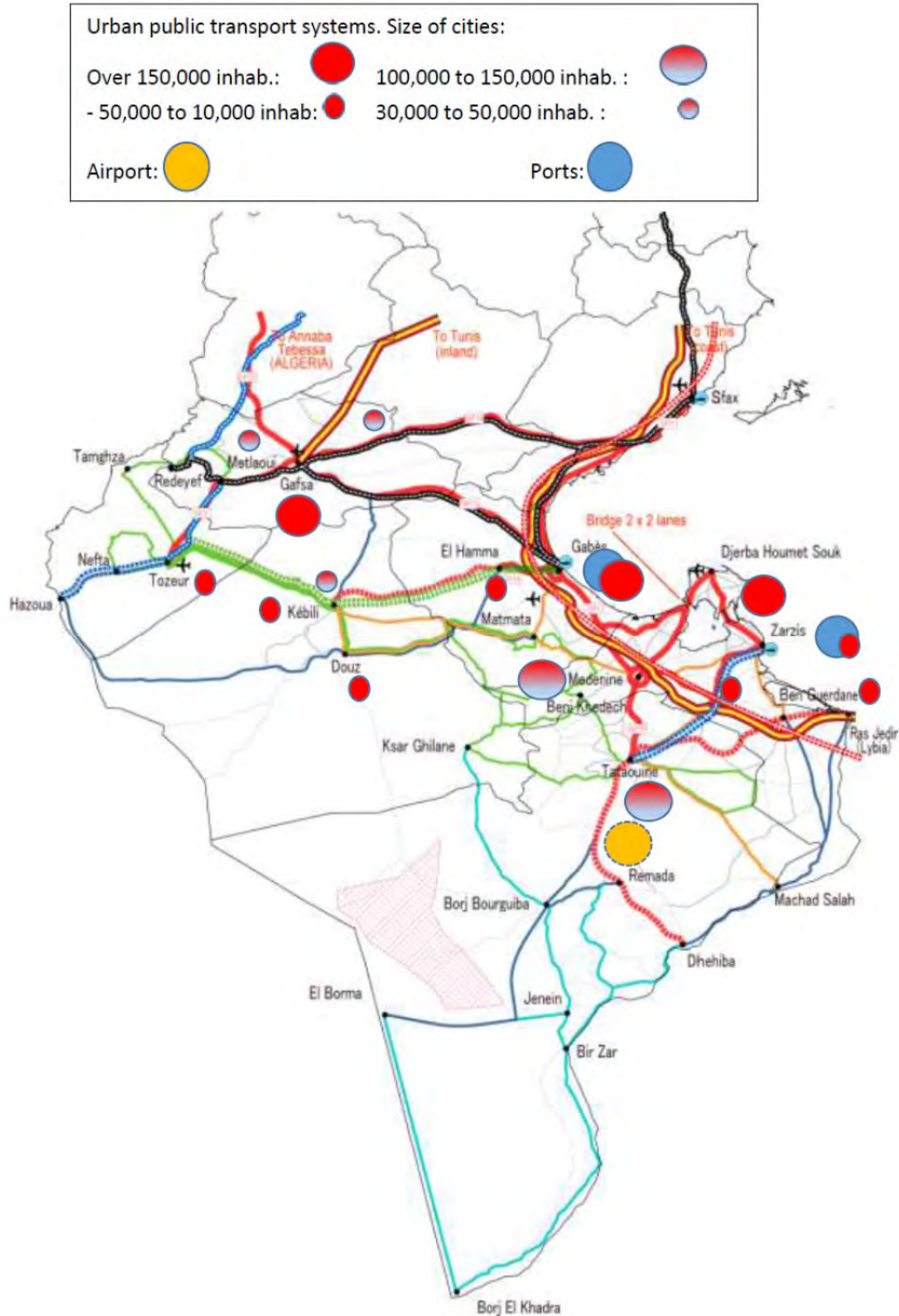


Figure 3.3-15 Synopsis of the proposed projects by year 2035 (transport domains)

3) Chart of implementation of the projects

The (tentative) development of the 41 projects is introduced in this section. All projects (and corresponding sub-projects if any) have been analyzed based on their planned duration and respective processes:

Table 3.3-10 Color codes for the projects

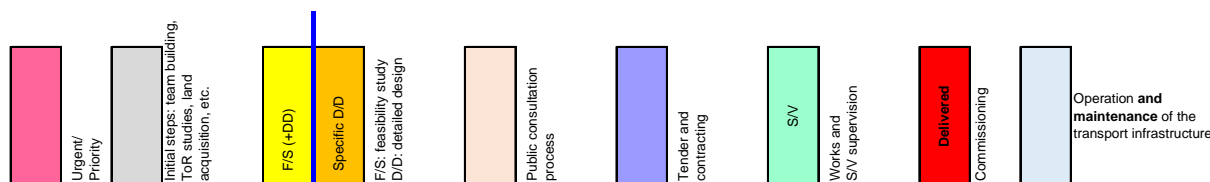
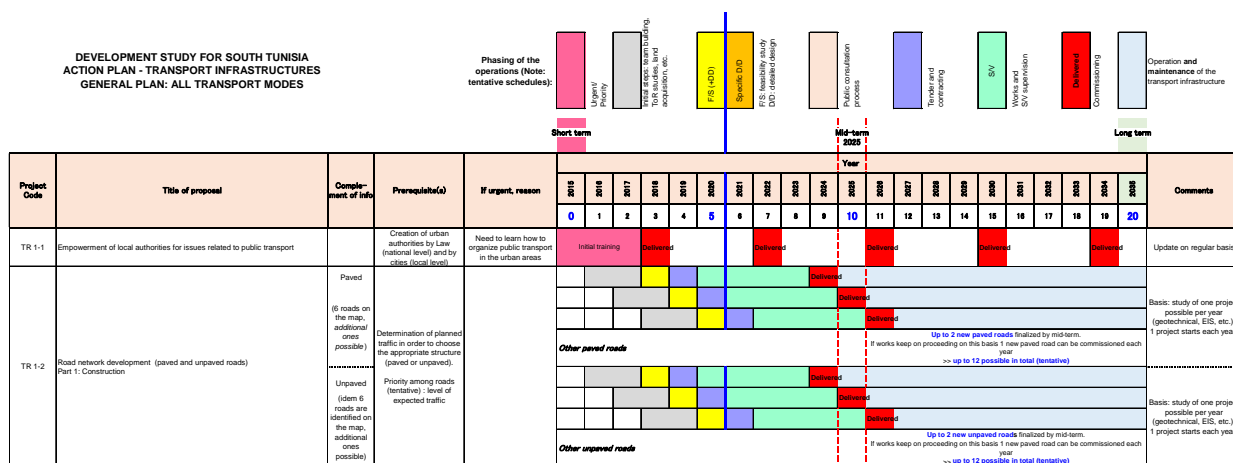


Table 3.3-11 Information available on the chart (example)



For each proposed project, the following information is available:

- Project code (TR1-1, etc.);
- Complete title of the proposed project;
- Additional information, if any;
- Prerequisite(s): what must be implemented beforehand to allow the start of implementation of the proposal;
- If the implementation of proposed project is considered as urgent, mention of the reason (s);
- Milestones for the project from 2015 to 2020 (short term), 2025 (mid-term) and 2035 (long term);
- Complementary comments, if needed.

- Note 1 - The main purpose of this chart is to check the succession of different tasks;
- Note 2 - These are tentative average schedules. Accuracy in time cannot be guaranteed;
- Note 3 - Year 2020 (short-term) is indicated with a blue line (“fast track” type of projects);
- Note 4 - Year 2025 (mid-term) is labelled with red dots on corresponding boxes;
- Note 5 - Blue area: the project switches nature, from construction to operation & maintenance;
- Note 6 - Not all large projects can be implemented at the same time due to limited availability of funding, material, etc., but five (5) new road projects are considered to be in a position to start each year (tentative).

Table 3.3-12 Strategic theme TR-1: Increase the possibilities of mobility

Project Code	Title of proposal	Comple-ment of info	Prerequisite(s)	If urgent, reason	Year																				Comments		
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		2035	
					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20	
TR 1-1	Empowerment of local authorities for issues related to public transport		Creation of urban authorities by Law (national level) and by cities (local level)	Need to learn how to organize public transport in the urban areas	Initial training		Delivered			Delivered			Delivered			Delivered			Delivered			Update on regular basis					
TR 1-2	Road network development (paved and unpaved roads) Part 1: Construction	Paved (6 roads on the map, additional ones possible)	Determination of planned traffic in order to choose the appropriate structure (paved or unpaved).	Priority among roads (tentative) : level of expected traffic	Other paved roads																				Basis: study of one project possible per year (geotechnical, EIS, etc.): 1 project starts each year.		
					Up to 2 new paved roads finalized by mid-term. If works keep on proceeding on this basis 1 new paved road can be commissioned each year >> up to 12 possible in total (tentative)																						
		Other unpaved roads																				Basis: study of one project possible per year (geotechnical, EIS, etc.): 1 project starts each year.					
		Up to 2 new unpaved roads finalized by mid-term. If works keep on proceeding on this basis 1 new paved road can be commissioned each year >> up to 12 possible in total (tentative)																									
TR-1-3	Trans Maghreb railway project study (Passengers/freight).		TR 3-3 and TR 3-7 made in parallel with TR 1-3	Plan for rail development depends on the results of the studies	Study		Consultation		Delivered			Development of rail transport in South Tunisia to be considered pending on results of the studies															Results to be validated
TR-1-4	Study of a tram-train system between Gabès and El Hamma		All works in El Hamma (TR 1-4, TR) to coincide		Coor-dinate															Delivered		Coordination based on studies					
TR-1-5	Rail link from Northern Tataouine to the Zarzis port		Gypsum ore are exploited		If OK		Delivered															OK: project is technically feasible, economically sound					
TR-1-6	Gabès - Light rail transport system (LRT, called in Tunisia "métro")		Creation of a transport authority in the city		Feasibility		Public consultation		Detailed studies			Delivered			Delivered			Importance of the consultation for a project image of the renewed city									
TR-1-7	Gafsa – TCSP dedicated bus lanes (BRT/BHNS type in future) - Phase 1		Creation of a transport authority in the city		TCSP phase															Delivered							
TR-1-7	Gafsa – TCSP dedicated bus lanes (phase 2: BHNS) - Phase 2		Once phase 1 terminated		BRT phase															Delivered							
TR-1-8	Construction of ring roads and detour roads		Priority based on traffic and road safety issues	Medenine urgent (new highway A1, road to Tataouine)	Other ring roads																				Basis: study of one project possible per year (geotechnical, EIS, etc.): 1 project starts each year.		
					Ring roads of up to 4 cities can be realized by mid-term. If works keep processing on this basis 1 new ring road can be commissioned each year >>> up to 14 possible in total (tentative)																						
TR-1-9	Development of an airport in Tataouine governorate		Gain in customers in Djerba and Tozeur airports		If enough traffic in Djerba and Tozeur airports															Delivered		Consultation to foster complementarity					
TR-1-10	Construction of a 2x2 lanes bridge between Jorf and Ajim		Financing package secured	Main bottleneck of South Tunisia	Delivered															Delivered		Selection of design of bridge to be decided					
TR-1-11	Two urban bridges in Gabès city - First bridge		Decision on moving the train station and start urban (re)development		Delivered															Delivered							
TR-1-11	Two urban bridges in Gabès city - 2nd bridge (possibly with space for "metro")		Decision on moving the train station and start urban (re)development		Delivered															Delivered							

Table 3.3-13 Strategic theme TR-2: Increase the intensity of mobility

Project Code	Title of proposal	Comple- ment of info	Prerequisite(s)	If urgent, reason	Year																				Comments	
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		2035
					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20
TR-2-1	Creation of <i>Voies Express</i> (express roads) by widening roads to 2x2 lanes		Threshold for implementation put on the level of traffic on the road determined each year by counting devices. Availability of funds, machines and technicians.	2 roads under study at present: Gafsa-Stax and Gafsa-Gabès	Identification																		Necessitates 2 dedicated teams working in parallel on this issue at MEHAT (chart shows fastest possible processing)			
					Procure																					
					Design																					
					Delivered																					
					Operate + guarantee																					
					Delivered																					
					Operate + guarantee																					
					Delivered																					
Other roads					Up to 8 additional enlargements of road sections during the period (if traffic is enough and necessitates enlargement)																					
TR-2-2	Program for the suppression of bottlenecks		Definition/determination of bottleneck, key for prioritization of works	Lots of traffic accidents and black spots	Identification																		Then continuous process during all period			
TR-2-3	Improving the quality of vehicles of the public transport companies			List of first vehicles to procure	Procure																		Then continuous process during all period			
TR-2-4	Replacement of old SNCFT passengers wagons and audit of the locomotives			List of first vehicles to procure	Paint design																		Then continuous process during all period			
TR-2-5	Other main roads - Continuous improvement via the creation of a Fund																						Continuous process during all period, based on availability of money in the Fund			

Table 3.3-14 Strategic theme TR-3: Increase the sustainability of mobility

Project Code	Title of proposal	Complement of info	Prerequisite(s)	If urgent, reason	Year																				Comments	
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		2035
					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20
TR-3-1	General accounting principles for public entities			With empowerment of AOTs			Delivered				Delivered				Delivered				Delivered			Delivered				Updates at regular basis (e.g. 3 years)
TR-3-2	Mission des Transports du Sud tunisien / South Tunisia Transport Taskforce (S3T)		Creation	Accompanying the whole process		Delivered																				Operation of the structure on a continuous basis
TR-3-3	Census of existing transport studies and creation of a compiled transport development master plan in South Tunisia.			Sum up of knowledge, all transport modes		Census	Compile	Delivered																		Then maintenance by S3T
TR-3-4	Road network development (paved and unpaved) - Part 2: Maintenance and improvement						Fund created																			Continuous process during all period, based on availability of money in the Fund
TR-3-5	ITS system for roads and road database			Needed for SIG and maintenance			Database created																			Continuous process : feeding + updating the database
TR-3-6	Comprehensive information system for public transport systems by bus			Information of public necessary for modal shift			GIS bus created																			Continuous process : feeding + updating the database
TR-3-7	Study of rail transport network for passengers/ freight in South Tunisia		Coordinated with study on high speed lane TR 1-3 and census of existing studies TR 3-3	Study necessary for decision making process			Consultation	Decision made																		Implementation on the railway development plan pending on the decision
TR-3-8	Traffic and parking master plan program (plans de circulation et de stationnement)				To be implemented in all main cities of South Tunisia by mid-term										Plans established											
TR-3-9	Fund for roads improvement outside cities			Possibility to finance opérations			Fund created																			Continuous process during all period, based on availability of money in the Fund
TR-3-10	Fund for streets improvement in cities			Possibility to finance opérations			Fund created																			Continuous process during all period, based on availability of money in the Fund

Table 3.3-15 Strategic theme TR-4: Increase the safety/eco-friendliness of mobility

Project Code	Title of proposal	Comple- ment of info	Prerequisite(s)	If urgent, reason	Year																				Comments	
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		2035
					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
TR-4-1	Detailed investigations for lethal road accidents in South Tunisia		Training of staff	Possibility to finance opé- rations	Fund created										Continuous process during all period, based on availability of money in the Fund											
TR-4-2	Continuous improvement of the tourist roads		Creation of a continuity in the roads and number of visitors for the corresponding tourist spots.	Roughly half at least of the roads are presumed to need urgent upgrading (to be confirmed by the ministry of Tourism)	Delivered																					
					Delivered																					
					Delivered																					
					Delivered																					
					Delivered																					
					Delivered																					
					Delivered																					
					Delivered																					
<i>Other tourist roads possible</i>																										
TR-4-3	Refurbishment of the inter-urban bus stations (<i>gares routières</i>) in the six governorates			Others	Delivered										Operation and maintenance of the bus stations											
				Gabès	Same duration as above, but should be coordinated with the refurbishment of the train station																					
TR-4-4	Program for the refurbishment/ development of SNCFT stations			Others	Delivered																					
				Gabès	Same duration as above, but should be coordinated with the refurbishment of the bus station																					
TR-4-5	Special Fund to finance projects and activities related to road safety		Approval from ministry of Finance for creation of the fund	Fund created										Continuous process during all period, based on availability of money in the Fund												

Table 3.3-16 Strategic theme TR-5: Support the production sector

Project Code	Title of proposal	Comple- ment of info	Prerequisite(s)	If urgent, reason	Year																				Comments	
					2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034		2035
					0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19		20
TR-5-1	Enforcement of the regulations in the transport sector (all modes)		Material (axle load weighing systems, speed meters, etc.)	Preserve infrastructure and lives, traffic calming.	Enforcement starts!										Ongoing during all period and after,										To start asap.	
TR-5-2	Improving the facilities of the public transport companies			Others	Delivered																					
				Gabès	Same duration as above, but should be coordinated with the refurbishment of the train and bus stations																					
TR-5-3	Renewing <i>louage</i> vehicles				Started					Then continuous process of exchanging all vehicles during all period																
TR-5-4	Development of the Gabès port			Depollution (for the harbour, for the city)	Further extensions to be considered pending of success of phase 1 of extension (update at mid term)																					
TR-5-5	Development of the Zarzis port		Existence of hinterland, in particular development of the production of gypsum ores	Create the <i>ad hoc</i> structure	Phase 1 of the development of the area (extension and development by phases)										Phase 2 if results phase 1 OK (3 years test period)											
TR-5-6	Development of freight transport by plane in South Tunisia				Creation of a business plan					Test implemented!					Follow-up pending on conclusions of the 2-year test period.											
TR-5-7	Development of logistics centres		Mapping of the existing projects.		Study OK!					Development plan established					Development based on the conclusions of the study.										Study of freight transport in South Tunisia: goods, volumes, frequency	
TR-5-8	Opening of additional border posts and improvement of existing ones		Agreement of Direction générale des Douanes		Planning to be established pending on the decisions of and in coordination with the Douanes Directorate.																					
TR-5-9	Elaboration of structured development scenarios for the Djerba Island			To finish before commissioning the bridge	Study phase 1					Phase 2 & consultation					Follow-up and works to be decided based on the study and taking into consideration the results of concertation.											
TR 5-10	Structured development scenarios for the infrastructure in Kebili governorate			Special long haul coaches for Gabes train station and Tozeur airport	Phase 1 rapid buses					Phase 2 new road					Phase 3 Chott centre + railtrack + train (to Tozeur, to Gabès)											

(D) PLANNING OF IMPLEMENTATION OF THE PROJECTS

Based on detailed information from previous charts, a focus on planning issues will be made in order to visualize the progress of development of all projects. The projects will be sorted by transport mode, in order to check more easily the possibilities of concurrence and/or complementarity.

In addition, please note that transport modes and strategic themes are correlated through the following grid:

Table 3.3-17 Correlation table: strategic themes of the proposals / transport modes

Code, name and description of the Strategy	TRANSPORT MODES						
	Roads	Railways	Ports	Airports and air freight	Vehicles and facilities	City transport development	General issues
TR-1: Increase the possibilities of mobility: upgrade accessibility to major cities in Tunisia and neighbouring countries and increase intra-governorate traffic	TR 1-2 TR 1-8 TR 1-10	TR 1-3 TR 1-4 TR 1-5	—	TR 1-9	—	TR 1-1 TR 1-6 TR 1-7 TR 1-11	—
TR-2: Increase the intensity of mobility: Enhance the capacity and the service quality of all transport modes	TR 2-1 TR 2-5	TR 2-4	—	—	TR 2-3	TR 2-2	—
TR-3: Increase the sustainability of mobility: Establishment and reinforcement of infrastructure operation and maintenance (OEM) systems	TR 3-4 TR 3-5 TR 3-9	TR 3-7	—	—	TR 3-6	TR 3-1 TR 3-8 TR 3-10	TR 3-2 TR 3-3
TR-4: Increase the safety/eco-friendliness of mobility: Consideration of the traffic safety and environment	TR 4-1 TR 4-2	TR 4-4	—	—	TR 4-3	—	TR 4-5
TR-5: Support the production sector towards international industries and services	—	—	TR 5-4 TR 5-5	TR 5-6	TR 5-2 TR 5-3	—	TR 5-1 TR 5-7 TR 5-8 TR 5-9 TR 5-10
Total (41):	10	6	2	2	5	8	8

The following points have also to be considered:

1: The proposals for projects focusing on “mobility” issues most often include a “Social sector component” for the support to the inhabitants in their activities and an “Economic sector component” for the support to the development of economy and production in South Tunisia.

For instance, the following proposals for projects in TR-1 to 4 also refer to strategic theme TR-5:

TR 1-5 Rail link Tataouine-Zarzis>>>	Facilitation of export of gypsum ores;
TR 2-1 Enlargement of roads >>>	Facilitation of road transport for goods;
TR 3-4 Road network maintenance >>>	Provide activity to road maintenance companies;
TR 4-2 Improvement of tourist roads >>>	Support to the development of tourist industry.

2: The proposed projects could also be sorted into the following sub-categories:

- Support to the development policy (total or part) in their starting phase;
- Permanent once established;
- With a phase of construction, then a phase of operation/maintenance;
- Other categories, if relevant.

Therefore, in the analysis here after a project can appear both for short, medium and long term effects.

3: The projects can be mainly short-term “fast track” type (completed during the five first years of the development plan), mid-term or long-term type, pending on duration and starting date. An inadequate or delayed start may hamper smooth development the following years

4: As indicated, all projects cannot technically start at the same time, due to limitation in availability of human (and financial) resources to be allocated to similar projects simultaneously. Priorities must therefore be settled pending on criteria determined *ex ante*.

For each transport mode, the following information is displayed here after:

- 1 Explanation of the development policy for the transport mode;
- 2 List of projects related to the said transport mode, and for each project related development scenario with considerations at short, medium, and long-term (*tentative*);
- 3 Synthesis map to locate all the corresponding projects.

1) Proposals for projects - Roads (outside urban areas)

The development of roads should be planned in terms of the following policies, in order to participate to and support the development of the South Region, since roads in Tunisia and in the South Region is the most important infrastructure for freight and passenger transport:

- promote the accessibility by resolving the missing links and bottlenecks in the South Region (refer to Strategy TR-1: Increase the possibilities of mobility)
- Upgrade the Level of Service (LOS) of each road by enhancing its capacity and quality (refer to Strategy TR-2: Increase the intensity of mobility).

These policies, closely related, contribute to support the production sector (TR-5: Support the production sector). Based on them, *Tunisie Autoroutes* is currently constructing the highway from Sfax to Libya border, which will be a coastal arterial road in the South Region and in Tunisia. *Tunisie Autoroutes* also plans to construct ECOSO highway (Gafsa-Tunis) which will improve North-South connections.

According to the traffic demand forecast shown in Figure 3.3-6 and Figure 3.3-7 (see page 3-207 and 3-208), the existing 2-lane trunk roads could accommodate the future traffic demand in terms of capacity. However, these trunk roads should be widened to 2 x 2 lanes in order to reduce traffic density and transportation time since they would be main trunk roads in the spatial plans as shown in Figure 3.3-11 and Figure 3.3-12 (page 3-213). Therefore, the widening of Tozeur-Gafsa-Sfax, Tozeur-Kébili-Gabès, Tataouine-Médenine (Zarzis) has high priorities in parallel with the construction of the highway from Sfax to Libya border and the construction of ECOSO highway.

In addition, in some cases passing sight distances are not enough for freight transport. So, these roads should be widened not only to smoothen traffic but also to ensure traffic safety. Kébili-El Hamma whose alignment and state is relatively better than the other roads should also be widened following these projects.

Following the development of these inter-governorate “*Voies express*” roads which will constitute a structuring backbone for both freight and passenger traffic, missing links and bottlenecks in the cities should be resolved by constructing ring roads and new bridges as well as improving intersections since long-trip freight vehicles are currently passing within the congested city.

In terms of continuity of the territory (*continuité du territoire*), a project for a bridge between El Jorf and Ajim is proposed. This bridge could permit to create a coastal connection from Zarzis to Djerba, Mareth and Gabès, and to foster the development of activities along this route.

These projects will create a much better situation for the overall road traffic in the area and will increase the potential for mobility. Measures shall be taken in order to promote traffic calming in city centres by appropriate features (street lightning, speed bumps and so-called “*Berliner cushions*”, etc.).

Tourist roads linking tourist spots should also be developed and adapted to attract more tourists. Institutional approaches should be required to improve the funding system and road maintenance, and to mitigate traffic accident.

With regard to their size, most of these projects will be launched on an individual basis, with a specific financing for one specific project. Nevertheless, special Funds can be established for smaller size projects, for the reduction of bottlenecks (individual projects) or for smaller features for improvement, with possibility of allocation of lump sums (sidewalks, speed-reducing devices...).

The challenge is the necessary increase of the budget for maintenance, in connection with the widening of roads and the construction of new ones. The quality of the maintenance has to be sustainable on a long-term basis with a corresponding financial envelope.

Priorities / fast tracks proposed:

- Establishment of secured sources of funding, with a focus on road safety dedicated funding (5 Funds altogether, linked to improvement: construction, maintenance, safety).
- Road database, basis to monitor and store all data on roads and roadworks + all connected data (other networks, bus networks, etc.).

Table 3.3-18 Proposals for projects - Roads

Reference	Proposals for projects related to Roads and to <i>Voies Express</i> (express roads) (10+2)
TR-1-2	Road network development (paved and unpaved roads), Part 1: New road construction
TR-1-8	Construction of ring roads and detour roads
TR-1-10	Construction of a 2x2 lanes bridge between Jorf and Ajim
TR-2-1	Creation of <i>Voies Express</i> (express roads) by widening roads to 2x2 lanes
TR-2-5	Other main roads - Continuous improvement via the creation of a Fund
TR-3-4	Road network development (paved and unpaved roads) Part 2: Maintenance and improvement
TR-3-5	ITS system for roads and road database
TR-3-9	Fund for roads improvement outside cities
TR-4-1	Detailed investigations for lethal road accidents in South Tunisia
TR-4-2	Continuous improvement of tourist roads
TR-4-5	<i>Special Fund to finance projects and activities related to road safety (all domains)</i>
TR-5-10	<i>Development scenario for infrastructure in Kébili governorate(part related to road)</i>

Table 3.3-19 Tentative planning of projects - Roads

Term	Reference	Actions
Fast track/ short term (before end 2020)	TR 3-5	Creation of the road database
	TR 3-4	Maintenance of roads (to be contd.)
	TR 2-5	Creation of the Fund to finance more easily works on main roads not enlarged to 2x2 lanes and implementation of the works
	TR 3-9	Creation of the Fund to finance more easily smaller scale works and implementation of the works
	TR 4-1	Assessment of the location of black spots and of main causes of accidents
	TR 4-5	Creation of the Fund and start of use to implement works on case by case basis.
Medium term (until 2025)	TR 1-2	Construction of 4 new roads, 2 paved and 2 unpaved
	TR 1-8	Construction of 4 ring roads
	TR 2-1	Widening of 6 liaison roads to be completed in mid-term (priority among road works)
	TR 3-4	Maintenance of roads (contd.)
	TR 2-5	Work on other main roads (via Fund)
	TR 3-9	Small scale works (via Fund)
	TR 4-2	Planning and realization of 9 touristic routes (see map here after)
	TR 4-5	Use of the Fund to implement works on case by case basis.
	TR 5-10	Construction of the road on the Chott (phase 2 of the project)
Long term (until 2035)	TR 1-2.	Construction of 1 new paved/unpaved road per year
	TR 1-8	Construction of 1 new ring road per year
	TR 1-10	Commissioning of the bridge between Jorf and Ajim planned for 2027 (year 12)
	TR 2-1	Widening of 20 additional roads maximum possible (if enough traffic)
	TR 3-4	Maintenance of roads (contd.)
	TR 2-5	Work on other main roads (via Fund)
	TR 3-9	Small scale works (via Fund)
	TR 4-2	Improvement of additional routes possible (priority: maintain the 9 existing ones).
	TR 4-5	Use of the Fund to implement works on case by case basis.

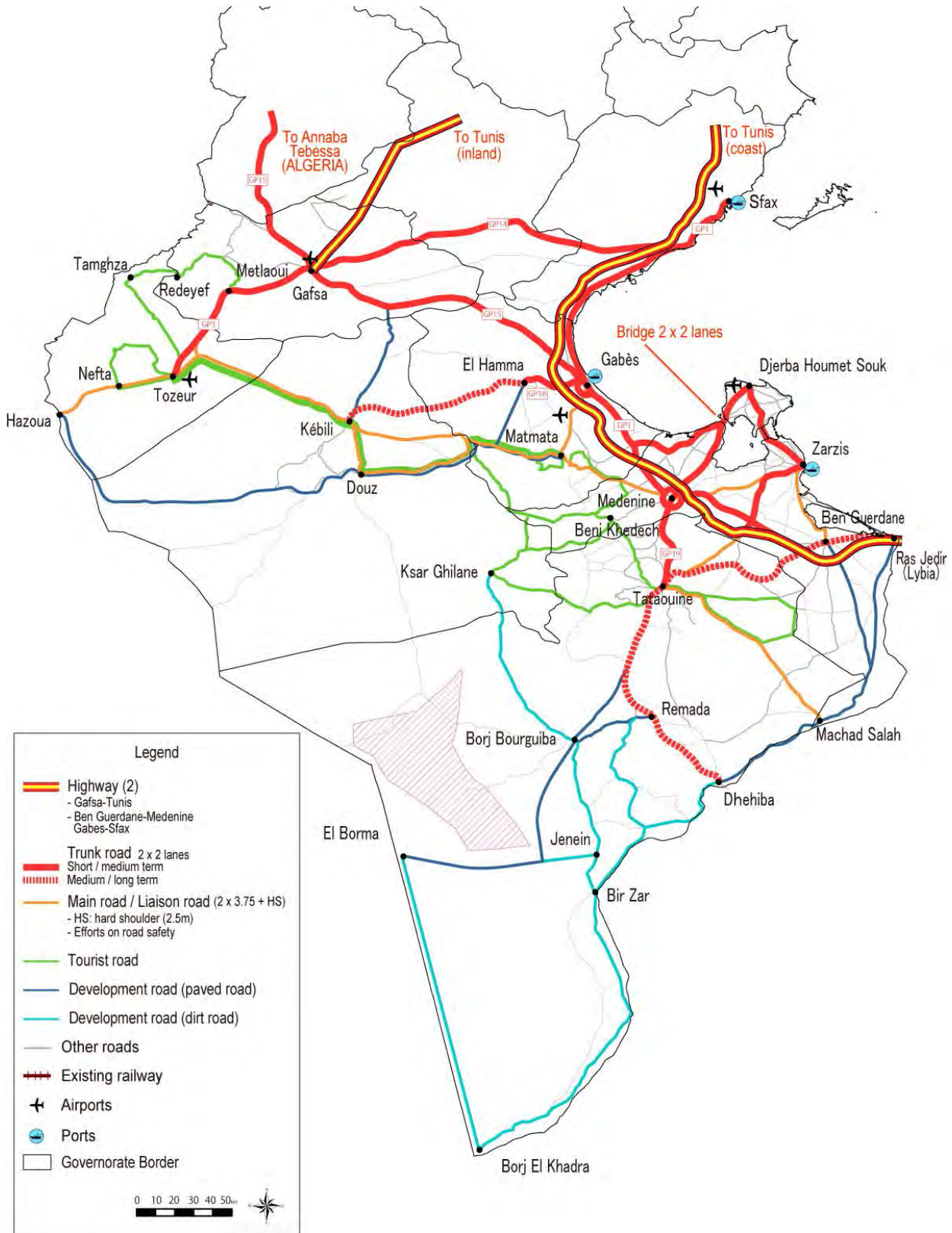


Figure 3.3-16 Synthesis – Planned roads in South Tunisia by 2035
 (details see presentations of individual projects here after)

2) Proposals for projects – Railways

The rail network in the South Region has been built for and is mainly used for transportation of mining, especially phosphate.

The railway network is however at present not very much adapted to the transport of passengers.

In order to develop the rail network in conjunction with other transport modes and to develop passenger and freight transport, the following activities and projects are planned:

- Strategic theme 1 (increase the mobility) will comprise projects for a high-speed line (the trans-Maghreb railway), a railway line between Tataouine and Zarzis and a mixed system tram-train (both use possible either inside or outside cities) between El Hamma and Gabès. This role could be supported by the study and development of a North-South connection by the western part of South Tunisia, nearby Tozeur.
- In terms of better intensity/better servicing (strategic theme 2) the issue will be to replace the old wagons, and to refurbish and redevelop train stations (**TR 4-4**) with a possible relocation of Gabès train station in Gabès outskirts for combined use: high speed lane, tram-train and “métro” LRT type transport system (+ louages, urban and inter-urban buses to be considered).

All these projects will first be addressed in a comprehensive study for the development of sustainable rail transport in South Tunisia (**TR 3-7**). This comprehensive study will be supported by a specific study of the high speed rail connection project from Libyan border to Sfax (then to Tunis), aiming in particular to select the best suitable type of line: passengers or passengers + freight, and corresponding constraints.

Note: the Ministry of Transport and SNCFT have a rehabilitation and development plan of railway in the Southern region for freight transport and passenger transport (project of high-speed line on the coast)It would therefore be of particular importance to strengthen the institutional framework in order to promote and accelerate these projects.

Priorities / fast tracks proposed:

- A general study on rail transports (passenger, freight) in whole South Tunisia region, including the missing links (see proposal **TR 5-10** for Kébili for instance) and the connection between the planned high-speed lane and existing rail network (Note: a specific study is planned to be developed in parallel for the high-speed lane);
- A program for service quality improvement for users/customers of the rail network: refurbishment of the rail stations, replacement of old passenger wagons.

Table 3.3-20 Proposals for projects - Railways

Reference	Proposals for projects for trains, Stations and Railways (7)
TR-1-3	Trans Maghreb railway project study (Passengers/freight).
TR-1-4	Study of a tram-train system between Gabès and El Hamma
TR-1-5	Rail link from Northern Tataouine to the Zarzis port
TR-2-4	Replacement of old SNCFT passengers wagons and audit of the locomotives
TR-3-7	Study of rail transport network for passengers/ freight in South Tunisia
TR-4-4	Program for the refurbishment/ development of SNCFT stations
TR-5-10	<i>Structured development scenarios for infrastructure in Kébili governorate (part related to rail)</i>

Table 3.3-21 Tentative planning of projects - Railways

Term	Reference	Actions
Fast track/ short term (less than 5 years)	TR 1-3	Conclusions of the fast train study to be available by 2020 (see TR 3-7)
	TR 2-4	First wagons to replace are purchased and put into service. Assessment of the locomotives – definition of needs for upgrading or replacement
	TR 3-7	Termination of the comprehensive study (passengers + freight, all network) by 2019
Medium term (until 2025)	TR 2-4	Continuation of the replacement of wagons Upgrading and replacement of locomotives if necessary (phase 1)
	TR 4-4	Refurbishment of all train stations in South Tunisia Construction of a new train station in Gabès (multi-modes)
Long term (until 2035)	TR 1-4	New tram+train transport system Gabès-El Hamma (if studies OK)
	TR 1-5	Termination of rail link North Tataouine - Zarzis port by 2027 (estd.)
	TR 2-4	End of replacement of wagons Upgrading and replacement of locomotives if necessary (phase 2)
	TR 5-10	Construction of railway links Kébili-Tozeur and Kébili-El Hamma by 2035

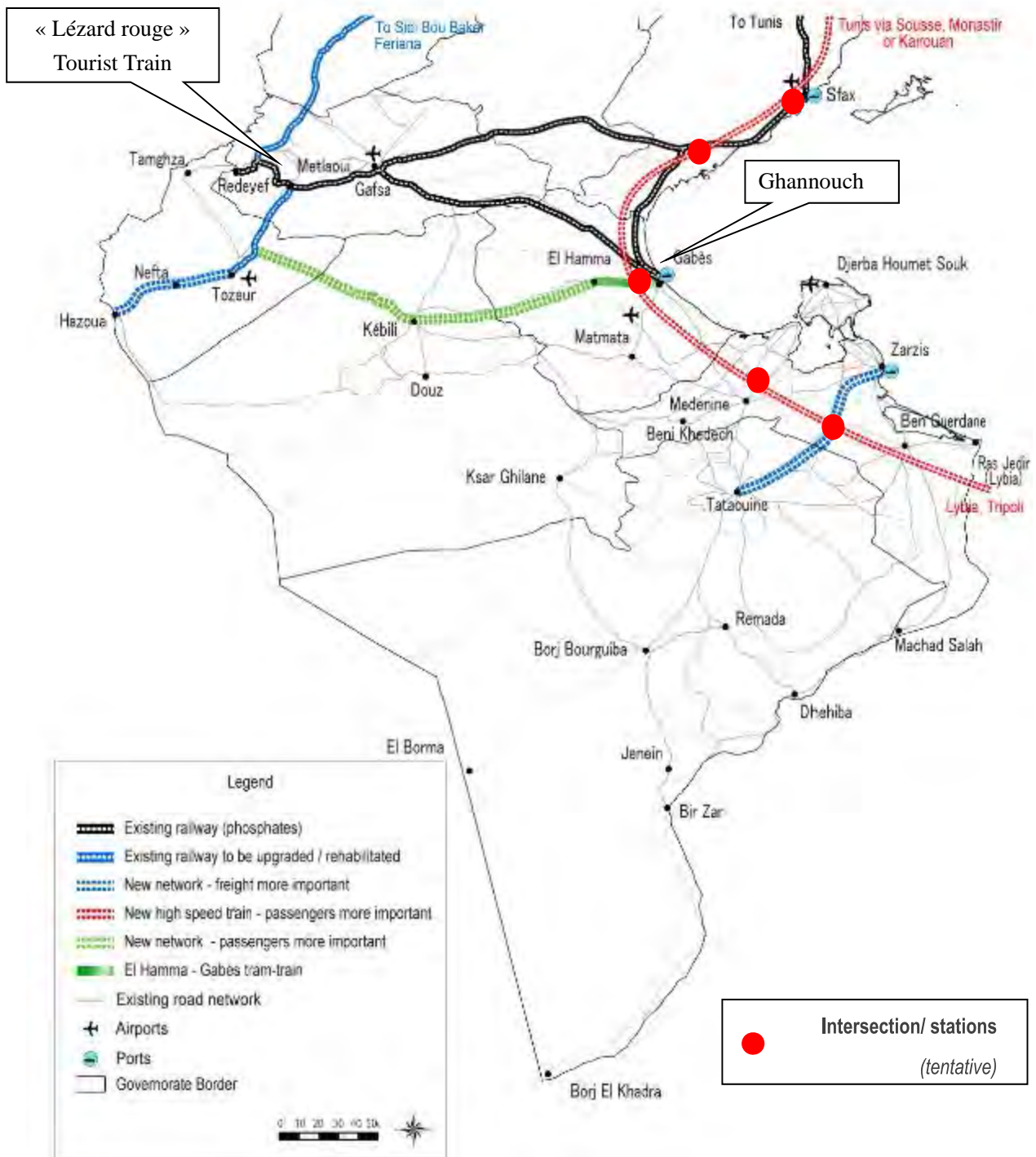


Figure 3.3-17 Synthesis – Planned railways in South Tunisia by 2035
 (details see presentations of individual projects here after)

3) Proposals for projects – Ports

There are two ports in South Tunisia: Gabès and Zarzis.

These ports are mainly used for export and are considered as crucial elements for the development of the area. Corresponding proposals are included in Strategic theme 5 (support the production sector).

In view to develop their activities in their respective domains of performance, two separate projects will be launched:

1. The Gabès port is well established, and one of the main ports for export of freight. Gabès will remain an important industrial port, with reinforcement and development of the activity catered on chemical facilities, and addition of one feature for easier handling on containers in the port area (storage area to be defined);
2. The Zarzis Port is at present of smaller size compared to the other ports managed by OMMP, *office de la marine marchande et des ports*, Agency for Merchant Navy and Ports):

However, the expansion of the Zarzis Port can be key to promote export and development of productive sector in the Southern region, taking available land and environment aspects into consideration, as opportunities for the general development of the structure:

- 135 hectare land reserve,
- existence of an economic development area with Free Trade Zone,
- proximity of A1 highway, section Médenine –Ras Jedir,
- planned construction of a railway line from Tataouine to Zarzis (**TR 1-5**).

Note1: the rail line between Tataouine and Zarzis, dedicated at first to freight transport (mainly gypsum ores) is in a position to be connected to the high-speed rail track (**TR 1-3**).

Note2: Expansion of ports, in general, necessitates some time in order to contribute to promote exports, due to the time necessary for shippers and forwarders to select a new port and relocate their capacities

Priorities / fast tracks proposed:

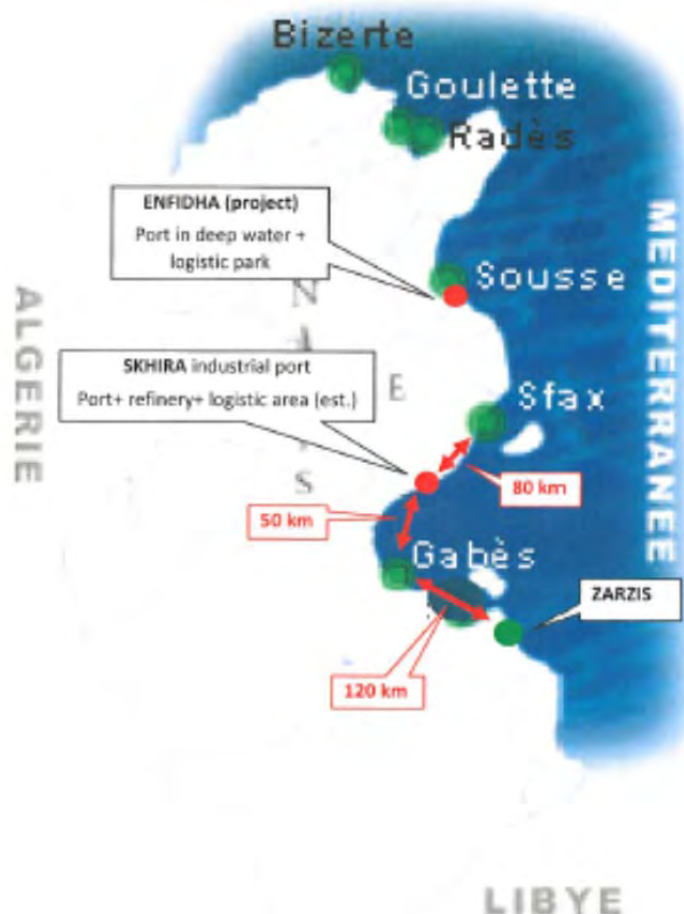
The two general proposals for Gabès and Zarzis include short-term components. The depollution is a key issue in the Gabès port and, in the case of Zarzis, a common structure has to be built in order to include all stakeholders of the development of the *hinterland* of the port (including the port).

Table 3.3-22 Proposals for projects - Ports

Reference	Proposals for projects for Ports (2)
TR-5-4	Development of the Gabès port
TR-5-5	Development of the Zarzis port

Table 3.3-23 Tentative planning of projects - Ports

Term	Reference	Actions
Fast track/ short term (less than 5 years)	TR 5-4	Cleaning/depollution of the Gabès port area Install equipment for handling containers Development of a storage area for containers
	TR 5-5	Creation of an <i>ad hoc</i> development structure (port + FTZ etc.) Install equipment for handling containers Development of a storage area for containers
Medium term (until 2025)	TR 5-4	The pollutants are removed – The issue is settled (in 2021) Development of the port area (post for petroleum in particular)
	TR 5-5	Development of new economic zone Development of the port area in conjunction (+storage containers)
Long term (until 2035)	TR 5-4	Half-term assessment in 2025 Further extension possible
	TR 5-5	Assessment of phase 1 (2025) 2 nd phase of extension of the structure Possibility of construction of a cruise terminal Note: the arrival of the railway line from Tataouine is foreseen in 2027



(Illustration source: OMMP)

Figure 3.3-18 Synthesis – Ports in South Tunisia by 2035
(details see presentations of individual projects here after)

4) Proposals for projects – Airports

Airport and related institutions should be developed to attract more passengers. Upgrading of existing Djerba and Tozeur Airports as well as the construction of a new Airport in Tataouine governorate is considered. In addition, the development of possibilities for airfreight transport will be promoted in all airports.

There are at present four airports in South Tunisia managed by OACA (civil aviation and airport office), with Sfax airport located just outside of the area (see map on following page). These airports are located on the same East-West axis and, in addition, two of the airports (Gafsa-Ksar and Gabès-Matmata) are located at the proximity of two bigger international airports (Tozeur-Neftah and Djerba-Zarzis respectively).

The current economic conditions and the decrease of the number of tourists coming to South Tunisia induce severe difficulties for these airports, with a poor servicing and infrastructures far from being fully under use.

If the situation changes (this could be the case if the Open Skies agreement leads to the same results in Tunisia that it did in Morocco), the 2 main airports could recover a passenger level similar or higher to the one of 2008.

In that case, a new airport in South Tunisia could be foreseen, providing a better service to the Tataouine-Médénine area, attracting customers from Western Libya area and permitting direct connections to the tourist regions of the region.

This leads to the following proposals:

- The Airport in Tataouine governorate (**TR 1-9**), a kind of symmetry to the Sfax airport seen on the Djerba- Tozeur axis (see figure here after), is considered as a new infrastructure, even if it may be created while taking advantage of the existing military airport in Remada. Corresponding proposal **TR 1-9** has therefore been included in strategic theme 1.
- The development of freight transport by plane is considered as a direct support to the local economy, with the developments of “just in time”: extra fresh fruits and vegetable, spare parts for industrial products, express mail, etc. It is therefore included in strategic theme 5 (support the production sector, proposal **TR 5-6**).

Priorities / fast tracks proposed:

The situation has moved as per the announcement that Remada Airport would be open to commercial planes. The situation has to be properly monitored in terms of potential effects to the traffic in other airports. In any case, the start of the 2-year experiment of freight transport should take place before 2020. This necessitates the preparation of a business plan (routes, customers, goods, prices).

Table 3.3-24 Proposals for projects - Airports

Reference	Proposals for projects for Airports and Air Freight (2)
TR-1-9	Development of an airport in Tataouine governorate
TR-5-6	Development of freight transport by plane in South Tunisia

Table 3.3-25 Tentative planning of projects - Airports

Term	Reference	Actions
Fast track/ short term (less than 5 years)	TR-1-9	Development of studies
	TR-5-6	Creation of project structure Study of business plan Implementation of the pilot project for 2 years
Medium term (until 2025)	TR-1-9	Validation of development plan in coordination with other airports
	TR-5-6	Assessment of the pilot project If success: continue
Long term (until 2035)	TR-1-9	Commissioning of new structure (year 2034)
	TR-5-6	If success continue and add destinations and/or frequencies.

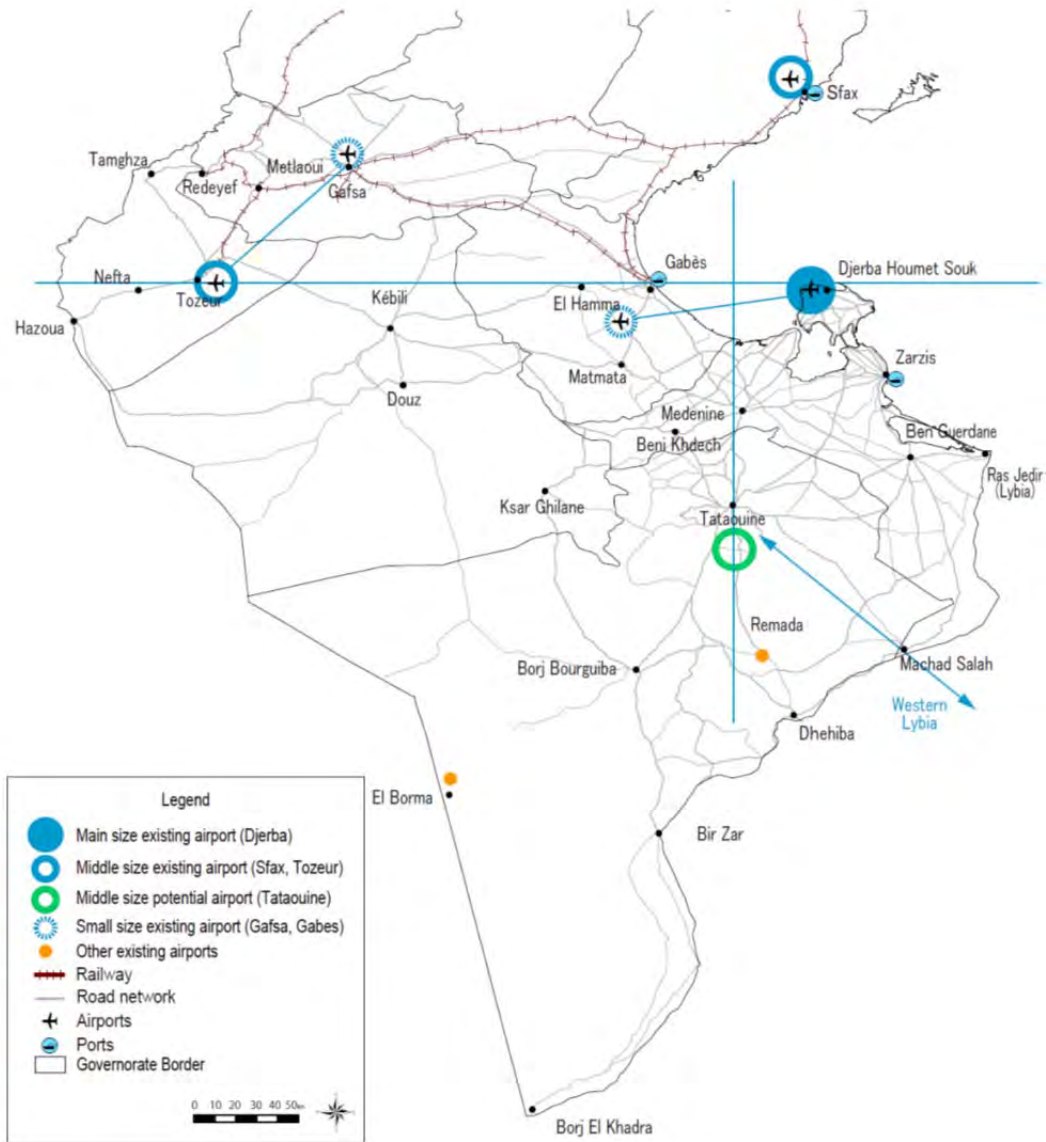


Figure 3.3-19 Synthesis – Airports in South Tunisia by 2035
(details see presentations of individual projects here after)

5) Proposals for projects – Urban and interurban transport

On the horizon 2035, pending on the hypothesis of growth of the population of South Tunisia, there could be 15 urban areas of over 30,000 persons where public transport networks can be established, or already exists and would have to be developed (see also Table 3.3-6 Population in South Tunisia in 2014 and 2035 (estd.)).

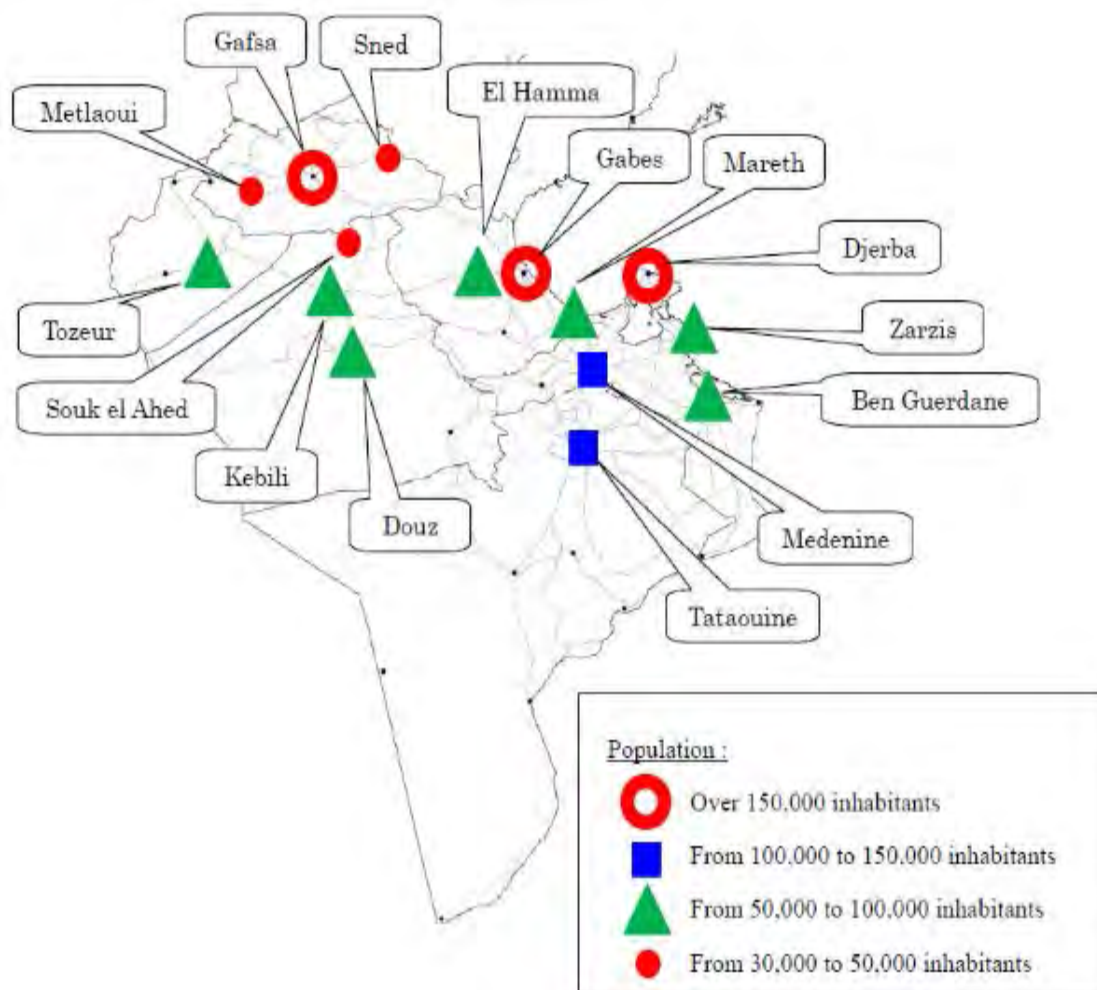


Figure 3.3-20 Synthesis – Cities/ group of delegations sorted by population in 2035 (est.)

The corresponding strategy regarding the development of public transport addresses the issues of construction (**TR-1**), intensity (**TR-2**), sustainability (**TR-3**), improvement of the transport environment (**TR-4**) and support to the production sector (**TR-5**, with in particular an important number of stakeholders in the *louage* system). It will comprise:

- In all cities, renewing buses and *louages*;
- Improve and refurbish bus stations (*gares routières*);
- In the most important and large urban areas, construction of lanes dedicated to buses and, traffic permitting, construction of high capacity public transport features, bus rapid transit (BRT) or Light rail transport (LRT, called in Tunisia *métro*, on rail or on rubber wheels).

In addition, better information of the customers and better management of public transport networks and on fleet of buses shall be supported by ITS systems.

Priorities / fast tracks proposed:

In the case of railways, improvement of the quality of facilities and vehicles are key to attract/secure customers and should be developed as a priority. In addition, better information has to be provided to clients, and adequate information system built up and delivered as soon as possible.

The two studies planned for Kébili and Djerba areas comprise an important part related to public bus transport. These studies should be finalized within the short term in order to facilitate smooth development of corresponding actions.

Table 3.3-26 Proposals for projects – Urban and interurban transport

Reference	Proposals for projects for Passenger Transport: vehicles and facilities (7)
(TR-1-4)	Study of a tram-train system between Gabès and El Hamma (rail, for reference)
TR-1-6	Gabès - Light rail transport system (LRT, called in Tunisia “ <i>métro</i> ”)
TR-1-7	Gafsa – TCSP dedicated bus lanes (BRT/BHNS type in future)
TR-2-3	Improving the quality of vehicles of public transport companies
TR-3-6	Comprehensive information system for public transport by bus
TR-4-3	Refurbishment of the inter-urban bus stations (<i>gares routièrès</i>) in the six governorates
TR-5-2	Improving the facilities of the public transport companies
TR-5-3	Renewing <i>louage</i> vehicles

Table 3.3-27 Tentative planning of projects - Urban and interurban transport

Term	Reference	Actions
Fast track/ short term (less than 5 years)	TR 1-6	Preliminary studies and public consultation
	TR 1-7	Studies realized by 2020 on several bus routes
	TR 2-3	The first vehicles are procured and commissioned
	TR 3-6	The information system is commissioned and operative
	TR 4-3	All refurbishments are realized (Note: for Gabès bus station in connection – location, time - with the new train station and future LRT station)
	TR 5-2	The program is prepared and implemented in designated locations
	TR 5-3	The oldest 10% of the fleet is replaced
Medium term (until 2025)	TR 1-6	All studies are implemented
	TR 1-7	Construction and commissioning of dedicated lines (TCSP)
	TR 2-3	A new number of vehicles is procured and commissioned
	TR 3-6	Operation, maintenance and continuous improvement of the system
	TR 5-2	The program of improvement of facilities is completed by 2021
	TR 5-3	The replacement of <i>louage</i> vehicles continues
Long term (until 2035)	TR 1-6	Tendering, construction works, commissioning estimated in year 18 (2033)
	TR 1-7	Commissioning of BRTs on a selection of TCSP lines (by 2033 also)
	TR 2-3	The fleet of buses has been completely rejuvenated
	TR 3-6	Operation, maintenance and continuous improvement of the system
	TR 5-3	All <i>louages</i> are renewed before 2030

6) Proposals for projects – Transport facilities in urban areas

In addition to previous proposals for project, some topics are specifically dedicated to the improvement of transport as a whole in the urban areas of South Tunisia. For instance, parking master plans (*plan de circulation et de stationnement*) should be established, having in mind that two categories of vehicles (public and private transport) have to coexist harmoniously on the same road network.

Priorities / fast tracks proposed:

- Mitigation of bottlenecks in urban areas: this action will smoothen traffic and increase overall capacity of streets, hence facilitating traffic and trade. The bridge proposed in Gabès city (**TR 1-11**)° have also for purpose to facilitate traffic in the area;
- The study in the Djerba island (**TR 5-9**), which will address issues related to transport facilities, has to be complemented as soon as possible

The projects are summarized here after:

Table 3.3-28 Proposals for projects – Transport facilities in urban areas

Reference	Proposals for projects for the Improvement of Transport inside the Cities (5+1)
TR-1-11	Two urban bridges in Gabès city
TR-2-2	Program for the suppression of bottlenecks
TR-3-8	Traffic and parking master plan program (<i>programme de plans de circulation et de stationnement</i>)
TR-3-10	Fund for streets improvement in cities
TR-4-5	Special Fund to finance projects and activities related to road safety (all domains)
TR-5-9	Elaboration of structured development scenarios for public transport in the Djerba Island

Table 3.3-29 Tentative planning of projects - Transport facilities in urban areas

Term	Reference	Actions
Fast track/ short term (less than 5 years)	TR 1-11	First studies of the urban bridges, pending on urban re-development in the area
	TR 2-2	Mapping of the bottlenecks The first works are implemented
	TR 3-8	Several plans are implemented (to be decided by the cities based on needs)
	TR 3-10	The Fund is created and financed The first projects start to be funded and implemented.
	TR 4-5	The road safety (RS) special Fund is created and in use (all domains)
	TR 5-9	The transport study is made and terminated, in particular for all urban areas of Djerba
Medium term (until 2025)	TR 1-11	The first bridge is studied and delivered (year 2023 estimated)
	TR 2-2	The program for suppression of bottlenecks is finalized by 2023 (tentative)
	TR 3-8	All traffic and parking plans have to be finalized by 2025
	TR 3-10	Projects for improvement of streets in cities are funded and implemented (<i>contd.</i>).

	TR 4-5	<i>The special Fund is in use (all road safety domains)</i>
	TR 5-9	The development scenario for transport in the Djerba Island is adopted (by 2022, tentative)
Long term (until 2035)	TR 1-11	The second bridge in Gabès is studied and delivered by year 2027, ahead of the construction of the LRT line (the bridge may also support the LRT line)
	TR 3-10	Projects are funded and implemented (<i>contd.</i>).
	TR 4-5	<i>The special Fund is in use (all road safety domains)</i>
	TR 5-9	Development projects in Djerba are implemented based on the scenario

7) Proposals for projects related to general issues

The strategic themes concerned are sustainability (establishment of the S3T entity, compilation of transport and infrastructure data over time), finance (road safety funding), support to the production sector (enforcement of regulations, support facilities), with two multi-sectoral studies for coordinated development in Djerba and Kébili.

Priorities / fast tracks proposed:

Several points have to be set in order to be in a position to implement the part of the development plan related to infrastructures:

- Regulations related to road and road transport (axle load, speed) have to be enforced;
- The authorities and staff in charge of public transport have to be trained;
- S3T has to be created in order to gather all stakeholders and all materials existing, and in view of making a first “compiled masterplan”;
- The system of detailed investigation of lethal accidents has to be established.

And then:

- The study for the development of logistics centers in South Tunisia has to be implemented;
- The facilitation system for rejuvenation of *louage* vehicles can start.

Table 3.3-30 Proposals for projects – General issues

Reference	Proposals for projects related to General Issues and support structures (8)
TR-1-1	Empowerment of local authorities for issues related to public transport
TR-3-1	General accounting principles for public entities regarding public transport)
TR-3-2	<i>Mission des Transports du Sud tunisien / South Tunisia Transport Taskforce (S3T)</i>
TR-3-3	Census of existing transport studies and creation of a compiled transport development master plan in South Tunisia.
TR-4-5	Special Fund to finance projects and activities related to road safety (RS)
TR-5-1	Enforcement of regulations in the transport sector (all modes)
TR-5-7	Program for the development of logistics centres
TR-5-8	Opening of additional border posts and improvement of existing ones
TR-5-9	Elaboration of structured development scenarios for public transport in the Djerba Island
TR 5-10	Structured development scenarios for infrastructure in Kébili governorate

Table 3.3-31 Tentative planning for projects – General issues

Term	Reference	Actions
Fast track/ short term (less than 5 years)	TR 1-1	The training program (local authorities) is established and implemented
	TR 3-1	The training program (accounting) is established and implemented
	TR 3-2	S3T mission is created and staffed
	TR 3-3	The census of studies is made and a first masterplan created by S3T
	TR 4-5	The road safety (RS) special Fund is created and in use (all domains)
	TR 5-1	Enforcement of regulations starts, staff are trained and material is bought
	TR 5-7	Compilation and assessment of projects of logistics parks Proposal for coordination made – Decision by 2020
	TR 5-8	Implementation on a case by case basis (with DG Douanes): location, content & timing of works
	TR 5-9	Comprehensive study realized in Djerba (all modes, with consultation) Decision on development to be made by 2020
	TR 5-10	Project in Kébili governorate: <i>Ad hoc</i> management structure created Finalization of phase 1 (bus transport)
Medium term (until 2025)	TR 1-1	<i>The training program is organized once again</i>
	TR 3-1	<i>The training program is organized once again</i>
	TR 3-2	<i>S3T mission is a permanent body in the structure (ODS)</i>
	TR 3-3	<i>S3T updates the information on a regular basis</i>
	TR 4-5	<i>The special Fund is in use (all road safety domains)</i>
	TR 5-1	<i>Enforcement continues on a long-term basis</i>
	TR 5-7	Coordinated development of the logistics centres starts
	TR 5-8	<i>Implementation on a case by case basis (with DG Douanes): location, content & timing of works</i>
	TR 5-9	Transport development initiatives start in the Djerba island
	TR 5-10	Phase 2 of the project (road on the Chott, shops) is implemented
Long term (until 2035)	TR 1-1	<i>The training program is organized once again</i>
	TR 3-1	<i>The training program is organized once again</i>
	TR 4-5	<i>The special Fund is in use (all road safety domains)</i>
	TR 5-1	<i>Enforcement continues on a long-term basis</i>
	TR 5-7	<i>Coordinated development of the logistics centres continues</i>
	TR 5-8	<i>Implementation on a case-by-case basis (with DG Douanes): location, content & timing of works</i>
	TR 5-9	<i>Transport development initiatives continue in the Djerba island</i>
	TR 5-10	The phase 3 of the project (railway, central milestone) is realized

8) Focus on the fast track (short term) projects

These projects are special because of the fact that from their implementation depends not only proper continuation of the said project, but also on start and/or proper development of related project(s).

Table 3.3-32 Short-term projects, sorted by category and number

Theme	Project Code	Title of proposal
STUDIES (7) (incl. rail)	TR-1-3	Trans Maghreb railway project study (Passengers/freight).
	TR-2-2	Program for the suppression of bottlenecks
	TR-3-3	Census of existing transport studies and creation of a compiled transport development master plan in South Tunisia.
	TR-3-7	Study of rail transport network for passengers/ freight in South Tunisia
	TR-5-6	Development of freight transport by plane in South Tunisia
	TR-5-7	Program for the development of logistics centres
	TR-5-9	Elaboration of structured development scenarios for public transport in the Djerba Island
FUNDS (5)	TR-2-5	Other main roads - Continuous improvement via the creation of a Fund
	TR-3-4	Development roads (paved or unpaved) Part 2: Maintenance and improvement (<i>including Fund</i>)
	TR-3-9	Fund for roads improvement outside cities
	TR-3-10	Fund for streets improvement in cities
	TR-4-5	Special Fund to finance projects and activities related to road safety
BUS TRANSPORT (5)	TR-2-3	Improving the quality of vehicles of public transport companies
	TR-3-6	Comprehensive information system for public transport by bus
	TR-4-3	Refurbishment of the inter-urban bus stations (<i>gares routières</i>) in the six governorates
	TR-5-2	Improving the facilities of the public transport companies
	TR 5-10	Structured development scenarios for the infrastructure in Kébili governorate (<i>phase 1: bus</i>)
INSTITUTIONAL SUPPORT (3)	TR-3-2	South Tunisia Transport Taskforce (S3T, <i>Mission des Transports du Sud tunisien</i>)
	TR-4-1	Detailed investigations for lethal road accidents in South Tunisia
	TR-5-1	Enforcement of regulations in the transport sector (all modes)
TRAINING (2)	TR 1-1	Empowerment of local authorities for issues related to public transport
	TR-3-1	General accounting principles for public entities regarding public transport
RAIL (2)	TR-2-4	Replacement of old SNCFT passengers wagons and audit of the locomotives
	TR-4-4	Program for the refurbishment/ development of SNCFT stations
ROADS (1)	TR-3-5	ITS system for roads and road database
LOUAGES (1)	TR-5-3	Renewing <i>louage</i> vehicles

3 main items appear:

- Realization of studies: apart from the studies directly dedicated to a project, 7 general studies will be launched during short term. This necessitates that S3T be properly structured, maybe with external support during this period.
- Creation of dedicated Funds: the point is to be in a position to secure funding for the projects on a sustainable basis. Here also during this starting phase 5 Funds should be created (and corresponding

funding allocated). In addition, the creation of the Road Safety Fund may be particularly difficult to implement. Here also, S3T would benefit from experienced support.

- Development of bus transport: compared to other transport modes, projects related to bus transport are easier to implement. Therefore, **bus transport as a whole** could be selected as “fast track / quick win” theme for early outcome of the development policy in the area.

In all domains, proper implementation during the first years is key for smooth development.

(E) ELEMENTS ON ESTIMATED COSTS OF THE PROJECTS

1) Elements of cost available during the study for similar projects

The elements of costs gathered during the study are compiled for reference.

(1) Roads:	<ul style="list-style-type: none"> - Construction of a 2x2 lanes trunk road: 5 million TND/km (similar to construction of highway). - No data for enlargement of a 2 lane road to a 2x2 lanes road have been found. An hypothesis of 4.5 million TND/km (90% of the price of new road) has been made as first analyze (this point has to be confirmed by further studies); - Rehabilitation of existing roads: (including sub-base and base course): 600,000 TND/km (surface replacement only): 250,000 TND/km - Maintenance of roads: - Repartition of the funding of road network maintenance for the main network (<i>titre I</i>) for 2013 (to be maintained). Total for the six governorates: 4,565 million TND Gabès 19.9%, Médenine 18.7%, Tataouine 15.1%, Gafsa 17.2%, Tozeur 14%, Kébili 15%. The general evolution of the budget for maintenance should be based on GRP growth in South Tunisia, since more activities imply more maintenance.
(2) Railways	<p>Base: project Enfhida-Menzel (48 km, 2-track metric line, including: tracks, structural works, one train station, excluding electrification works) estimated (by SNCF) at 125 million TND >> Average cost/km: 1 million EUR/km (or 2.113 MTND, 130.04 MJPY)</p>
(3) Bridges	<p>Large bridge base : Radès bridge in Tunis in 2009 (1630m viaduct+260m main bridge +1600m viaduct and access roads) of a total length of 3,500 m for an estimated total overall construction cost of circa 80 million EUR, or 170 million TND or 10,340 million JPY) 250 meter PC girder bridge: around 20 million USD, 30 million TND (1,800 MJPY)</p>

2) Summary of cost estimates for the proposed projects (when available)

Project code	Titre	Status	Unit	Unit price (M TND)	Quantity	Total (M TND)
TR 1 : Increase the possibilities of mobility						
TR 1-1	Empowerment of local authorities for issues related to public transport	AP	n.a.			
TR 1-2	Road network development (paved and unpaved roads), Part 1 : New road construction	PR	n.a.			
TR-1-3	Trans Maghreb railway project study (Passengers/freight).	AP	Request	10	1	10
TR-1-4	Study of a tram-train system between Gabès and El Hamma	PR	km	2.113	20	42.26
TR-1-5	Rail link from Northern Tataouine to the Zarzis port	PR	km	2.113	120	253
TR-1-6	Gabès - Light rail transport system (LRT, called in Tunisia “ <i>métro</i> ”)	CP	n.a.			
TR-1-7	Gafsa – TCSP dedicated bus lanes (BRT/BHNS type in future)	PR	n.a.			
TR-1-8 (sorted by)	Detour road El Hamma (13 km)	PR	km	5	13	65

Project code	Titre	Status	Unit	Unit price (M TND)	Quantity	Total (M TND)
alphanumeric order of names of cities)	Ring road Médenine (total 25 km, already built 6.5 km)	PE	km	5	25	125
	Detour road Tataouine (20km, tentative)	PR	km	5	20	100
	Detour road Tozeur (n.a.)	PR	n.a.			
	Detour road Zarzis (15 km, ongoing)	PE	n.a.			
	<i>Other detour roads (to be determined)</i>					
TR-1-9	Development of an airport in Tataouine governorate	PR	n.a.			
TR-1-10	Construction of a 2x2 lanes bridge between Jorf and Ajim	CP	Bridge	170	1	170
TR-1-11	Two urban bridges in Gabès city	PR	Bridge	15	2	30
TR-2: Increase the intensity of mobility						
TR-2-1 (sorted by growing number of classification of the route)	GP1 –Sfax-Gabès section Widening to 2x2 lanes 137 km	CP	km	4.5	137	620
	GP1 – Gabès-Médenine section Widening to 2x2 lanes 73 km	CP	km	4.5	73	330
	GP1 – Médenine-Ben Guerdane section widening to 2x2 lanes 77 km	CP	km	4.5	77	350
	GP3 - Gafsa-Tozeur Widening to 2x2 lanes 93km	CP	km	4.5	93	420
	GP14 - Road corridor Gafsa-Sfax Widening to 2x2 lanes 197 km	AP	km	4.5	197	890
	GP15 - Road corridor Gafsa-Gabès Widening to 2x2 lanes 149 km	AP	km	4.5	149	670
	GP15 - Axis Gafsa- Algerian border Widening to 2x2 lanes 107 km	CP	km	4.5	107	490
	GP16 - El Hamma-Gabès Widening to 2x2 lanes 20 km	CP	km	4.5	20	90
	GP16 - Kébili-El Hamma Widening to 2x2 lanes 100 km	CP	km	4.5	100	450
	GP19 – Tataouine-Médenine Widening to 2x2 lanes 49 km	PE	km	4.5	49	220
	GP19 – Tataouine- Remada - Dehiba Widening to 2x2 lanes 127 km	PR	km	4.5	127	571.5
	C107 – Mareth- New bridge Widening to 2x2 lanes 47 km	PR	km	4.5	47	220
	C108 - New bridge – Médenine Widening to 2x2 lanes 55 km	PR	km	4.5	55	250
	C111 – Tataouine Ben Guerdane Widening to 2x2 lanes 75 km	PR	km	4.5	75	337.5
	C116 – Djerba airport - New bridge Widening to 2x2 lanes 22 km	PR	km	4.5	22	100
	C117 – Zarzis-Djerba airport Widening to 2x2 lanes 52 km	CP	km	4.5	52	240
	C117 - <i>Chaussée romaine</i> section Widening to 2x2 lanes 7 km	PE	n.a.	4.5	n.a.	n.a.
R118 – Zarzis - A1 highway Widening to 2x2 lanes circa 30 km	CP	km	4.5	30	135	

Project code	Titre	Status	Unit	Unit price (M TND)	Quantity	Total (M TND)
	<i>Other routes to be widened to 2x2 lanes (to be determined)</i>					
TR-2-2	Program for the suppression of bottlenecks	PR	n.a.			
TR-2-3	Improving the quality of vehicles of public transport companies	PR	n.a.			
TR-2-4	Replacement of old SNCFT passengers wagons and audit of the locomotives	PR	n.a.			
TR-2-5	Other main roads - Continuous improvement via the creation of a Fund	PR	Fund			
TR-3: Increase the sustainability of mobility						
TR-3-1	General accounting principles for public entities regarding public transport	PR	n.a.			
TR-3-2	<i>Mission des Transports du Sud tunisien / South Tunisia Transport Taskforce (S3T)</i>	PR	n.a.			
TR-3-3	Census of existing transport studies and creation of a compiled transport development master plan in South Tunisia.	PR	n.a.			
TR-3-4	Road network development (paved and unpaved roads), Part 2: Maintenance and improvement	PR	n.a.			
TR-3-5	ITS system for roads and road database	CP	n.a.			
TR-3-6	Comprehensive information system for public transport by bus	PR	n.a.			
TR-3-7	Study of rail transport network for passengers/ freight in South Tunisia	PR	n.a.			
TR-3-8	Traffic and parking master plan programs (<i>programme de plans de circulation et</i>	PR	n.a.			
TR-3-9	Fund for roads improvement outside cities	PR	Fund			
TR-3-10	Fund for streets improvement in cities	PR	Fund			
TR-4: Increase the safety/eco-friendliness of mobility						
TR-4-1	Detailed investigations for lethal road accidents in South Tunisia	PR	n.a.			
TR-4-2	Continuous improvement of tourist roads	PR	n.a.			
TR-4-3	Refurbishment of the inter-urban bus stations (<i>gares routières</i>) in the six governorates	PR	n.a.			
TR-4-4	Program for the refurbishment/development of SNCFT stations	PR	n.a.			
TR-4-5	Special Fund to finance projects and activities related to road safety	PR	Fund			
TR-5: Support the production sector						
TR-5-1	Enforcement of regulations in the transport sector (all modes)	PR	n.a.			
TR-5-2	Improving the facilities of the public transport companies	AP	n.a.			

Project code	Titre	Status	Unit	Unit price (M TND)	Quantity	Total (M TND)
TR-5-3	Renewing <i>louage</i> vehicles	PR	n.a.			
TR-5-4	Development of the Gabès port	AP	n.a.			
TR-5-5	Development of the Zarzis port	AP	n.a.			
TR-5-6	Development of freight transport by plane in South Tunisia	PR	n.a.			
TR-5-7	Program for the development of logistics centres	AP	n.a.			
TR-5-8	Opening of additional border posts and improvement of existing ones	AP	n.a.			
TR-5-9	Elaboration of structured development scenarios for public transport in the Djerba Island	PR	n.a.			
TR 5-10	Structured development scenarios for the infrastructure in Kébili governorate	PR	n.a.			

Status: PR: Proposition by the JICA Expert team, CP: Conception by the government of Tunisia,

AP: Under study, PE: Under execution (in the year 2014)

Source: JET

(F) DETAILED PRESENTATION OF EACH PROJECT (SORTED BY STRATEGIC THEMES)

In the present section, all 41 proposals for projects are introduced, sorted by strategic theme and by increment number (project codes). A summary chart is displayed at the beginning of each section.

Sector	Strategy	TR-1	Increase the possibilities of mobility			
	Plan		Actions	Term	Cost	
Infra	a) Institutional and human capacity development plan	TR 1-1: Empowerment of local authorities for issues related to public transport	<ul style="list-style-type: none"> - Check of the data of census - Organization of first meeting to ask the consent of all cities involved and make the request - Creation of the structure - Financing and logistics - Staffing the structure - Definition of the scheme of interaction with cities, transport company and ministry of Transport 	Short	n.a.	
	b) Facility and infrastructure development plan		TR 1-2: Road network development (paved and unpaved roads), Part 1: New road construction	<ul style="list-style-type: none"> - Identification of the route - Pre-empting and securing the land - Detailed study on costs and advantages of the project - Decision - If YES, buying the land - Technical and environmental studies, tendering - Supervising works - Commissioning the new road - Maintaining the road 	Mid	n.a.
			TR-1-3: Trans Maghreb railway project study (Passengers/freight).	<ul style="list-style-type: none"> - Study of a new railway line - Determine the best use: passengers only or freight + passengers- - Determine the stations and their position - For each station, determine the interconnections with other transport modes and networks - Estimate land acquisition costs and construction costs, duration and organization of the works 	Short - Mid	10 M TND
			TR-1-4: Study of a tram-train system between Gabès and El Hamma	<ul style="list-style-type: none"> - Determine the potential users of the tram-train and the profitability of the project - Determine the route and stops of the tram-train. - Determine the mode of connection with Gabès city transport (place?) - Compensate the income of Gabès city transport system if tram-train takes passengers inside the city area - Secure and purchase the necessary land - Create a structure to operate the tram-train and a supervising body - Build the physical link, the facilities (stations) and the workshop. - Buy the material (tram-train) - Operate the tram-train 	Short	42.26 M TND
			TR-1-5: Rail link from Northern	<ul style="list-style-type: none"> - Determine potential users of the train line and profitability of the project - Determine the route and stops of the train (3 main stops: 2 terminus stations and 	Short	253 M TND

		Tataouine to the Zarzis port	<ul style="list-style-type: none"> - connection with the high speed line). - Determine the servicing inside the Zarzis port area and Tataouine industrial area - Secure and purchase necessary land - Build the physical link, the facilities (stations for freight and passengers) and the workshop. Buy the material (train, wagons for freight and passengers) - Operate the train 		
		TR-1-6: Gabès - Light rail transport system (LRT, called in Tunisia "métro")	<ul style="list-style-type: none"> - Create a public authority for transport in the Gabès area (TAGR) - Determine the route and number of potential users. - Place of workshop. - Selection of material - Positioning of stations - Creation of a structure to inform the public - Tendering for tracks and facilities - Supervision of works (around 3 years) - Tendering for material - Revision of routes of existing bus lines. Reallocation of buses previously on LRT route - Commissioning - Operation - 3-year or 5-year convention for operation 	Short	n.a.
		TR-1-7: Gafsa – TCSP dedicated bus lanes (BHNS/ BRT type in the future)	<ul style="list-style-type: none"> - Creation of a public authority for the public transport in the Gafsa area (TAGA) - Creation of a structure to inform the public - Purchase of new material fitted to needs - Determination of route of the trunk line(s) Design of the lines (priority at crossings, etc.) - Tendering and supervision of works (around 1,5 year) - Multi-annual convention - Possibilities of extension of line and/or transport capacity 	Short	n.a.
		TR-1-8: Construction of ring roads and detour roads:	<ul style="list-style-type: none"> - Determine the alignment of the ring/detour road - Secure and buy land - Finalize studies and tending - Supervise the works - Re-establish existing networks, signaling - Commission the road - Maintain the road 	Short	500 M TND
		TR-1-9: Development of an airport in Tataouine governorate	<ul style="list-style-type: none"> - Determine the status, size and position of the airport - Secure the land - Realize studies of clientele and construction costs - Take decision on economic and technical feasibility - IF YES buy land - Realize studies for terminal, tracks and 	Mid	n.a.

			<ul style="list-style-type: none"> facilities - Launch tenders - Supervise the works. - Prepare servicing of the airport (access roads, other networks) - Promote the airport towards airline companies, freight carriers, tour operators and shop operators - Get authorizations - Commissioning the infrastructure - Operate, maintain and develop the airport 		
		<p>TR-1-10: Construction of a 2x2 lanes bridge between Jorf and Ajim</p>	<ul style="list-style-type: none"> - Decision on the procedure: state project or PPP - Determination of the alignment of the bridge (<i>profil en long</i>) - Determination of the shape of the bridge - Technical studies (toll barrier or not at 1 side) and tendering - Supervise the works - Commission the bridge - De-commission of the ferry. Reallocation of staffs - Operate and maintain the bridge 	Short	170 M TND
		<p>TR-1-11: two urban bridges in Gabès</p>	<ul style="list-style-type: none"> - Scheduling of the project (1 bridge, 2 bridges) - Technical studies and tendering - Supervision of the works - Commissioning the bridge(s) - Operate and maintain the bridge 	Short - Mid	30 M TND

Strategy	TR-1	Increase the possibilities of mobility		
Project	TR 11-1	Empowerment of local authorities for issues related to public transport		
Intervention Area	All urban areas of South Tunisia over 30,000 inhabitants now or in the future	Implementing agency	Cities + Ministry of Transport (support)	
Description				
<p>The new Constitution favours empowerment of local authorities. This includes issues related to public transport with the creation of <i>Autorités Organisatrices de Transport</i> (AOT). Corresponding training has to be delivered by Tunisian and international specialists on all aspects related to local laws and specificities. Support to the training costs (in Tunis or on site) could be borne through ODA support scheme, or comprised for instance in a “twinning” scheme as organized by the EU.</p>				
Action Plan				
Actions	Relevant organizations		Role	
- Check of the census	<ul style="list-style-type: none"> - State - Ministry of Transport - Ministry of Interior - All cities/ agglomerations over 30,000 inhabitants of South Tunisia (15 by 2035) - S3T if desired by the cities - Transport company as a counterpart when the structure exists 		- The threshold of 30,000 inhabitants (technical, based on mobility characteristics in Europe) or other standard is set by the State to authorize the creation of such entities	
- Organization of first meeting to ask the consent of all cities involved and make the request			- Common structure means common needs, common requirements and common income and expenses> cities must volunteer to join.	
- Creation of the structure			- Authorization by the State	
- Financing and logistics			<ul style="list-style-type: none"> - How are corresponding costs covered, and by whom? - Cost of office, supplies and logistics. 	
- Staffing of the structure			- Minimum: 1 president, 1 secretary, 1 accountant (can be seconded by other structures if wished)	
- Definition of the scheme of interaction with cities, transport company and min. of Transport			- This new structure has to find its place in interaction with existing structures, and to establish a suitable and performing scheme of relations with them (on the long term, this structure will have to manage subsidies for public transport inside the perimeter on behalf to the board of cities (AOT) + other members and auditors if wished).	
Indicator			Risk	
<ul style="list-style-type: none"> - The census of population matches criteria and thresholds defined by the Tunisian State - The group of cities accept to create a structure in common - The State accepts their official request - The structure is established, staffed and operative. 			<ul style="list-style-type: none"> - Criteria too demanding>> no structuring of public transport facilitated is most of cases - Dissentions between cities: no creation of the structure (not enough inhabitants, no continuity, etc.) - No financing enough for the structure in order to have it operate adequately for the interest of all the parties (including the transport company). 	

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR 1-2	Road network development (paved and unpaved roads), Part 1: New road construction	
Intervention Area	All South Tunisia, mainly southern part	Implementing agency	Ministry of Equipment/DREs
Description			
<p>The corresponding category of projects covers the construction and development of new roads, not their maintenance (for maintenance see specific project TR3-4). At this point and considering the number of parameters not yet determined, it is not possible to address more accurately the issue. For instance, is it a priority to increase activities in the most southern part of the territory by creation of a paved link between El Borma and Bir Zar in the Southern part of Tataouine governorate? The case being, at which horizon?</p> <p>These routes are outlined in this “Development” part in view of their further study.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Identification of the route	<ul style="list-style-type: none"> - Min. Equipment - DREs - MDICI/ODS/S3T - Min. Environment (Environmental Impact Study, IES) - Other ministries pending on interests - Corresponding Governorate (s) - Interested cities - ONSR (national authority for road safety, under supervision of Min. Interior) 	- Pending on requests, Min. Equipment defines an route with a few options (<i>fuseaux</i>)	
- Securing the land		- Based on these options the land is secured in order to avoid transfer of property or increase of land prices (maximum duration to be determined)	
- Detailed study on costs and advantages of the project, environmental studies (IES)		- The additional studies permit to choose between potential routes and to select the most appropriate one based on technical, economic and environmental criteria (IES in particular)	
- Decision		- Decision to be taken under the supervision of the State or Governorate depending on road: go / no go / decision postponed	
- If YES, buying the land		- If yes the land is bought and transferred to the State domain (if appropriate)	
- Technical and environmental studies, tendering		- The ministry of Equipment/ DRE launches the studies with a specialized consultant if necessary, and the tendering process is prepared	
- Supervising the works		- The Min. Equipment supervises the construction works with the support of a consultant if necessary	
- Commissioning the new road		- The new road is open to circulation (check of road safety issues to be made beforehand)	
- Maintaining the road		- See proposal for project TR 3-4	
Indicator		Risk	
<ul style="list-style-type: none"> - The decision is taken - The road is commissioned 		<ul style="list-style-type: none"> - The road does not fulfil criteria; - Unforeseen problems happen; - Problems of maintenance (see TR 3-4) 	

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-3	Trans-Maghreb railway project study (Passengers/freight)	
Intervention Area	All South Tunisia (direct/indirect)	Implementing agency	Min. Transport
Description			
<p>In its preamble, the Tunisian Constitution praises the effort of the Country “with a view to supporting Maghreb unity as a step towards achieving Arab unity, integrating with the Muslim and African nations, and cooperating with the peoples of the world”. The high-speed train construction project in Tunisia, from Cairo to Tripoli, Tunis, Algiers and Casablanca, should be considered as a political will for a vision of integrated development in the region.</p> <p>In addition to this, the new line (minimum characteristics: double tracking on all the line, rail of 60 kg/m minimum standard linear mass, 130 km/h minimum for speed of passenger transport) can be the backbone for the development of rail transport in the area²¹. It would comprise stations for connection with buses and/or regional rail transport lines if enough potential customers (indicated by red dots on the rail transport map).</p> <p>As one consequence, the rail station of Gabès should be moved from the city centre to the outskirts of Gabès, with corresponding possible urban re-development.</p> <p>This line can either be for passengers only (with higher speed characteristics) or for passengers + freight, providing an increased speed for both.</p> <p>Depending on use, the positioning of stations may differ, having in mind that there cannot be too many stations on the line, otherwise commercial speed of trains would decline.</p> <p>A tentative positioning of passenger stations is indicated on the map of page 3-53 for reference:</p> <ul style="list-style-type: none"> - station #1: Ben Guerdane-Tataouine, at the intersection of the new line with the Tataouine-Zarzis line to be constructed (see proposal TR 1-5) - station #2: Médenine-Djerba (via bridge, see proposal for project TR 1-13); - station #3: Gabès (outside the city centre); - station #4: Skirha and/or Ghannouch (mainly for freight); - station #5: Sfax. <p>The most appropriate type of line and the cost of construction should be determined by the study (cost of this study estimated at 4 million EUR, financing asked to the European Investment Bank (EIB) in 2012, no decision since then).</p>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Study of a new railway line (minimum characteristics: double tracking on all the line, rail of 60 kg/m minimum standard linear mass, 130 km/h minimum for speed of passenger transport) 	<ul style="list-style-type: none"> - Min. Transport - Min. <i>Domaines de l'Etat et Affaires foncières</i> (Min. of Domains) - Min. Environment (supervision of Environmental Impact Study) - Governorates - DR Transport (in particular Gabès and 	<ul style="list-style-type: none"> - Min. Transport (+ DRs) sets the ToR - SNCFT indicates characteristics of tracks and speed if: <ul style="list-style-type: none"> passengers only; passenger and freight and provides estimates of traffic in both cases - SNTRI and Sotragames (+ other SRT if relevant) provide statistics on bus passengers in connection with rail transport - ODS provides data on economy in short, medium and long terms Min. Domains indicates the availability of land on the proposed alignments and the value 	



²¹ And, for part of it, this new rail track could replace the Médenine-Gabès section of the network not achieved since the 1980's and now not corresponding to new characteristics of the line and new location planned for Gabès station.

- Determinate the best use: passenger transport or freight + passenger transport	<p>Médenine)</p> <ul style="list-style-type: none"> - SNCFT - MDICI/ODS - SNTRI - Sotragames - S3T (proposal TR 3-2) for supervision/ reporting/ follow up 	- Min. Transport proposes based on the result of studies (including EIS) - Parliament votes
- Determine the stations and their position, in particular the new Gabès station		- Min. Transport and Min. Equipment propose - SNCFT realizes and supervises
- Estimate land acquisition costs and construction costs, duration and organization of works		- Min. Domains - SNCFT - Min. Transport - Min. Equipment (level crossing roads)
- For each station, determine the interconnections with other transport modes or networks		- Discussions between SNCFT, SNTRI, Sotragames, ministry of Transport and representatives of DR (regional Directorates) of Equipment and Transport, with participation of S3T.
Indicator		Risk
<ul style="list-style-type: none"> - The study is terminated by end 2017 with clear recommendations and estimates - Decision taken by Parliament in 2018 on the construction of line (yes/no) and its use (passengers, freight or not) 		<ul style="list-style-type: none"> - Construction costs too expensive if high speed lane. - Parts of land not available or requiring lots of time to acquire, either in rural areas or in the outskirts of Gabès. - Geological/ archaeological findings

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-4	Study of a tram-train system between Gabès and El Hamma	
Intervention Area	El Hamma-Gabès	Implementing agency	Min. Transport + <i>ad hoc</i> operating structure
Description			
<p>The city of El Hamma (84,500 inhabitants planned in 2035) is located at about 20 km from Gabès. There is an important traffic between the 2 cities for commuting purposes (home-office). Due to this important traffic, it is proposed to enlarge the road to 2x2 lanes (see proposal for project TR 2-5).</p> <p>However, one could also take advantage of the project of LRT-tramway-métro in Gabès city centre (see proposal for project TR 1-6) to create a new rail track. Ideally, the tram-train would start from El Hamma city centre, leave El Hamma and go in parallel with the new 2x2 lanes road, join the new train station in Gabès and there would pursue on the tracks of the new “<i>métro</i>” line into Gabès city centre.</p> <p>Travellers from El Hamma could then easily get to their office in Gabès, and vice versa.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Determine customers of the tram-train and profitability of project	<ul style="list-style-type: none"> - Ministry of Transport - Ministry of Equipment - Ministry of Agriculture (agricultural lands) - Min. Environment (supervision of Environmental Impact Study) - MDICI/ODS - SNCFT - Sotragames - City of Gabès - City of El Hamma - S3T 	- Min. Transport makes the Terms of Reference of the study, selects the consultant and checks the outcome	
- Determine route and stops of the tram-train.		- Min. Transport checks the technical validity of proposal. Min. Equipment and Agriculture inform on potential difficulties.	
- Determine mode of connection with Gabès city transport and location		- The city of Gabès indicates whether or not they want the tram-train to come into city centre and use the tracks of the métro. Else stop at the level of new Gabès station.	
- Compensate the income of Gabès city transport network if the tram-train picks up passengers inside the city area		- The company owning the tram-train will perceive fees from clients of Gabès if they board the train. A compensation agreement has to be made between Gabès city transport and El Hamma tram-train under the supervision of Min. Transport and S3T.	
- Secure and purchase the necessary land		- Min. Domains	
- Create a structure to operate the tram-train and a supervising body		<ul style="list-style-type: none"> - Structure to operate: Sotragames? SNCFT? Mix of the two? Other company? - Supervising body includes Gabès, El Hamma, cities in between with stations the case being, the operator, min. Transport and S3T as consultative bodies. 	
- Build the physical link, the facilities (stations) and the workshop. Buy the material (tram-train)		<ul style="list-style-type: none"> - Engineering company selected by supervising structure. - The structure buys the material with financing at preferential interest rates and lends it to the operator who must operate and maintain it + train drivers. 	
- Operate the tram-train		<ul style="list-style-type: none"> - The operator operates and is financially interested if the number of customers increase because of his initiatives (appropriate schedules, communication, attractive tariff packages...). - The structure supervises the operation. - Every 3 to 5 years, a tender takes place in order to select a new operator (if necessary). 	
Indicator		Risk	
<ul style="list-style-type: none"> - The line is built - The number of customers increases - The system is at financial equilibrium 		<ul style="list-style-type: none"> - non availability of land for the planned route - Environmental impact study (EIS) negative - incompatibility between LRT and tram-train systems 	

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-5	Rail link from Northern Tataouine to the Zarzis port	
Intervention Area	Tataouine and Médenine governorates	Implementing agency	Ministry of Transport
Description			
<p>The distance by road from Tataouine to Zarzis is circa 120 km. The planned railway line is considered to be mainly dedicated to the transport of freight from Tataouine to the Zarzis port.</p> <p><u>This project is crucial for the development of the Tataouine-Zarzis area, for several reasons:</u></p> <ol style="list-style-type: none"> 1. transport of the gypsum extracted north of Tataouine to the Zarzis Port; 2. transport of materials to be produced in Tataouine area to the Zarzis port; 3. connection of the Zarzis port with South Tunisia rail network 4. connection of the Zarzis port development area with South Tunisia rail network 5. possibility for public train transport Tataouine- intersection with fast train line - Zarzis. <p>The connection by railway links permits the development of both Zarzis port, Zarzis industrial area of activities and of Tataouine industrial area, located north of the city nearby the area of production of gypsum (production of construction materials in particular).</p> <p>The design of the connection between Zarzis and Tataouine (around 100 km by direct road) is not finalized. Due to the necessity of diminishing the number of connections/stops with the new high- speed line, the possibility is to position the link either nearby Médenine or nearby Ben Guerdane.</p> <p>A link near Ben Guerdane would link the area of this city to Zarzis and Tataouine. In any case, the positioning of both lines: “high speed line” and “Zarzis-Tataouine line” have to be carefully examined in order to optimize the position of their intersection (with a station to be installed).</p> <p>The support from ODA agencies to purchase locomotives and wagons for this line must also be considered.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Determine the customers of the train line and the profitability of the project	- Ministries of Transport, Equipment, Industry and Domains, MDICI/ODS - SNCFT	- Specialized consultant, or project and route to be approved ex ante as “of superior interest for the development of South Tunisia” (State level decision) - decision on the fact that the line is for freight only or for freight+passengers (State level decision)	
- Determine the route and stops of the train (3 main stops: 2 terminus stations and the connection with the high speed line).	- Cities of Tataouine, Zarzis (and Ben Guerdane pending on choice of route) - Min. Environment (supervision of Environmental Impact Study)	- ministry of Transport in connection with Equipment and Agriculture, pending on: - available land; - upstream decision on route (nearby Médenine or nearby Ben Guerdane)	
- Determine the detail servicing inside the Zarzis port area and Tataouine industrial area	- Association of producers/ makers in Tataouine - Association of Development of the Zarzis port area	- Min. industry verifies the proposed paths and possibilities for extensions of the line pending on layout of the two terminus areas - Min. Transport verifies the optimization of the whole line and the end-to-end delay (crucial if passengers)	
- Secure and purchase the necessary land	- Association of Development of the Zarzis port area	- Min. Domains (then remits to SNCFT?)	
- Build the physical link, the facilities (stations for freight and passengers) and the workshop. Buy the material (train, wagons for freight and passengers)	- S3T	- Engineering consultant supervised by SNCFT - SNCFT buys the material with financing at preferred rates.	

- Operate the train and maintain the railway track		- SNCFT operates the line and maintain the material and the facilities, both for freight and for passengers.
Indicator		Risk
<ul style="list-style-type: none"> - Construction of the tracks - Operation of line and of 2 terminus stations - Operation of the connection with high speed line 		<ul style="list-style-type: none"> - Not enough production of gypsum to necessitate implementation of the construction of the line ; - Non availability of land (EIS, others) - Drop in prices of gypsum - Less quantity of ores available

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-6	Gabès - Light rail transport system (LRT, called in Tunisia “<i>métro</i>”)	
Intervention Area	Cities of Gabès, Ghannouch and Metouia (pending on alignment)	Implementing agency	Transport authority of Gabès region (here after TAGR)
Description			
<p>The city of Gabès has launched a study on traffic (<i>plan de circulation et de stationnement</i>) which suggested the creation of a line of LRT, called in Tunisia “<i>métro</i>”. This idea is relevant for several reasons:</p> <ol style="list-style-type: none"> 1) The size of the city by 2035 – 175,100 inhabitants (and 84,500 in El Hamma including lots who come to Gabès to work and may use the tram-train system as described in the proposal TR 1-2) is coherent with the size of other cities having LRT systems; 2) At present, all streets in Gabès bear the same “value” and “weight” in term of traffic assignment²² : the traffic is split among all streets almost without priority(ies)/ hierarchy, generating lots of conflicts at intersections; 3) A project exists to move the train station (and existing or planned related network) from the city centre and from the area near the shore, hence liberating space for other uses, including LRT tracks; 4) Another project exists to reclaim/re-urbanize part of the city centre nearby the oued, formerly a military airport and at present wasteland (see pictures). This project, located less than 1km from the actual railway station, includes numerous housing lots, and would greatly benefit of a structured transport system ; 5) Enhancing the standing of the city with a focus on environment (marine oasis, cleaning of the gulf) is a political will. A structured public transport network is appropriate in this scheme, since it brings a new image to a city and since it is using electrical power for its trunk line; 6) In Gabès there is only one public transport company, Sotragames, which has a network comprised of buses but which could also probably manage a LRT line under the supervision of an organizing entity with improved knowledge of transport related issues (organisation see proposal TR 1-1); 7) Last but not least, there is a tourist area near the seaside, and tourists are usually public transport users. LRT, thanks to important glazed surfaces, is a nice tool/means to discover and appreciate the city. <p>It is early to determine a route for an LRT line at this stage, but the key values of the project are described above. Some illustrations will facilitate understanding of this idea and its promotion (Gabès railway station is in the north in the part of the page of the booklet):</p>			
			
Figure TR1-6-1 Extension of the area near the oued (Project - View from above)		Figure TR1-6-2 Extension of the area near the oued (Project - Artwork)	

²² In French language: « *les voiries ne sont pas hiérarchisées* ».



Figure TR 1-6-3 Railway line bordering the reclaimed area



Figure TR 1-6-4 Natural scenery of the oued toward the sea

Note: LRT is not yet popular in Japan, despite being already in use in numerous other countries and despite the fact that Japanese railway companies make and sell LRT vehicles. This operation could constitute a good opportunity to associate Japanese engineering companies with companies of other countries (France for example) having lots of experience and references in this type of projects.

Action Plan

Actions	Relevant organizations	Role
- Create a public authority for transport in the Gabès area (TAGR)	- Ministry of transport - Ministry of Interior - Cities of Gabès, Ghannouche, El Metouia,	- The public authority to be created will be the overseeing structure for the project, the client, and will own the materials to be purchased
- Determination of route and number of customers> Place of workshop.	- Min. Environment (supervision of Environmental Impact Study)	- External consultant under responsibility of structure. The issue is to create a performing line joining the main points of pedestrian traffic (dense building areas, administrations, universities, hospitals etc.). If needed, TAGR buys the land for the workshop.
- Selection of material, Positioning of stations	- Sotragames - MDICI/ODS/S3T	- The positioning of the stations depends on the overall length and on the type (on tires, on rails, etc.) of the selected material
- Creation of a structure to inform the general public		- The construction of LRT will interact a lot with city life and citizens have to be informed by the transport authority of Gabès region.(TAGR)
- Tendering for tracks and facilities		- TAGR launches the tenders, ministry of Transport supervises, S3T attends and reports
- Supervision of works (around 3 years)		- Consultant under supervision of TAGR, reporting by S3T
- Tendering for material		- TAGR
- Revision of routes of existing bus lines. Reallocation of buses previously on LRT route		- TAGR + Sotgames. The buses previously on LRT route and their drivers are allocated to new lines in order to improve servicing of the city.
- Commissioning		- TAGR allocates operation to Sotragames (same transport ticket for bus and métro, if tariff based on the time spent on the network)
- Operation with a fixed-term contract		- Sotragames, under supervision of TAGR and with reporting of S3T. Note: Sotragames should look for additional sources of income (advertisement for example)

<ul style="list-style-type: none"> - Convention on time basis. 		<ul style="list-style-type: none"> - If Sotragames becomes a private type structure, a contact/convention has to be elaborated with TAGR and renegotiated at regular periods (3 to 5 years) in order to decide on new tariff structures, new kilometers, lines, etc. Competition possible with other bus companies.
Indicator		Risk
<ul style="list-style-type: none"> - TAGR is created, with a communication structure - The Métro is constructed - The Métro operates jointly with buses (and tram-train) - Number of customers increases regularly - Financial results of operation are good 		<ul style="list-style-type: none"> - no creation of ad hoc structure - No financing possible - No integration of transport modes (bus/metro/tram) - People still use private transport because transport too expensive or not fitted to the needs of the population

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-7	Gafsa – TCSP dedicated bus lanes (BRT/BHNS type in the future)	
Intervention Area	Gafsa urban area	Implementing agency	City of Gafsa + TAGA+ STR Gafsa
Description			
<p>The urban area of Gafsa will have a population of 177,100 inhabitants in the horizon 2035, and should receive benefit from an appropriate and structured system of transport.</p> <p>In this case and taking into consideration the general layout of the city, a development comprising the following steps may be foreseen:</p> <ul style="list-style-type: none"> - step 1: constitution of a core network of bus lanes and (re)organization of the urban bus network of SRT Gafsa around this structuring network; - step 2: purchase when necessary of more modern material with more passenger capacity; - step 3: creation of dedicated transport lanes for this network (or TCSP: <i>transport en commun en site propre</i>); - step 4: if sufficient passenger traffic, installation in some or all these TCSP lanes of BRT type buses (in French: <i>bus à haut niveau de service</i>, BHNS) - step 5: restructuration of the bus network around these axes, the vehicles not dedicated to the core network because transport being made by BHNS/BRTs will be allocated to other lines or new lines in the city/agglomeration in order to improve the service (in French <i>la desserte</i>). 			
Action Plan			
Actions	Relevant organizations	Role	
- Creation of a public authority for the transport in the Gafsa area (TAGA)	<ul style="list-style-type: none"> - Ministry of Transport - Ministry of Interior - City of Gafsa and neighboring cities - Min. Environment (supervision of Environmental Impact Study, if study necessary) - SRT Gafsa - MDICI/ODS - S3T 	- The public authority to be created will be the supervising structure for the network project and will own the materials to be purchased	
- Creation of a structure to inform the general public		- The development of public transport is of concern to the general public (works) and interacts with city life. Citizens must be kept informed by TAGA	
- Purchase of new material fitted to needs		- Estimation of present and future needs (10-year horizon) by TAGA	
- Determination of route of trunk line(s)		- External consultant under responsibility of TAGA. The issue is to create a performing trunk line/ lines with adequate connections (<i>gares de correspondance</i>) with other lines of the network..	
- Design of the lines (priority at crossings...)		- TAGA launches the tenders, ministry of Transport supervises, S3T attends and reports	
- Tendering/supervision of works (around 1,5 year)		- If SRT Gafsa (urban part) becomes a private structure, a multi-annual contact/convention will have to be developed with TAGA (competitive bidding).	
- Multi-annual convention		- The convention defines the criteria under which such further extension shall be planned and implemented.	
- Possibilities of extension of line and/or capacity			
Indicator		Risk	
<ul style="list-style-type: none"> - The average age of the park of vehicles is reduced - The trunk line is built and the network restructured - The commercial speed on the trunk line increases of more than 5 km/h. - The number of customers of the public bus service increases. 		- The infrastructure is not appropriate to the traffic and becomes overloaded, with buses following each other.	

Strategy	TR-1	Increase the possibilities of mobility																						
Project	TR-1-8	Construction of ring roads and detour roads																						
Intervention Area	See list here below	Implementing agency	Min. Equipment / DREs																					
Description																								
The projects considered under this theme are as follows (tentative list):																								
<table border="1"> <thead> <tr> <th>Designation (sorted by alphabetical name of city)</th> <th>Length (km)</th> <th>Cost (million TND)</th> </tr> </thead> <tbody> <tr> <td>Detour road El Hamma (13km)</td> <td>13</td> <td>65</td> </tr> <tr> <td>Ring road Médenine (total 25 km already built 6.5 km)</td> <td>25</td> <td>125</td> </tr> <tr> <td>Detour road Tataouine (40km)</td> <td>20</td> <td>100</td> </tr> <tr> <td>Detour road Tozeur (n.a.)</td> <td>n.a.</td> <td>n.a.</td> </tr> <tr> <td>Detour road Zarzis (15 km, ongoing)</td> <td>n.a.</td> <td>n.a.</td> </tr> <tr> <td><i>Other detour roads, to be determined</i></td> <td>n.a.</td> <td>n.a.</td> </tr> </tbody> </table>				Designation (sorted by alphabetical name of city)	Length (km)	Cost (million TND)	Detour road El Hamma (13km)	13	65	Ring road Médenine (total 25 km already built 6.5 km)	25	125	Detour road Tataouine (40km)	20	100	Detour road Tozeur (n.a.)	n.a.	n.a.	Detour road Zarzis (15 km, ongoing)	n.a.	n.a.	<i>Other detour roads, to be determined</i>	n.a.	n.a.
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Detour road Zarzis (15 km, ongoing)	n.a.	n.a.																						
<i>Other detour roads, to be determined</i>	n.a.	n.a.																						
<p>1. Médenine: The increase of the traffic in and around Médenine (highway, GP1, better connection with Tataouine) will necessitate the completion of the construction of the 2x2 lanes ring road around the city in order to prevent transit traffic to enter the city centre. Parts of those works are already undertaken.</p> <p>2. Zarzis: Similar to a ring road in its purpose (extract transit traffic from city centre, offer better conditions of fluidity outside the city centre while at the same time improving the conditions of mobility and road safety inside the city centre) this type of project should be developed in coming years. The project of detour road for the city of Zarzis is ongoing under financing of the Tunisian State budget.</p> <p>3. El Hamma: El Hamma is an important cross point (<i>carrefour</i>) located near Gabès. Here, also both for transit traffic easing and for road safety related issues, it would be beneficial to construct a detour road. This operation should, if possible, be made in connection with the extension to 2x2 lanes of the El Hamma – Gabès road (proposal for project TR 2-5) and with the construction of a tram-train (proposal for project TR 1-4).</p> <p>4. Tataouine: The city of Tataouine has been developed along its main road. At present this road serves both as an axis for the city transport (the only bus line of the city is passing through this road) and as a transit axis, in particular for trucks of the petroleum industry, which carry heavy materials throughout the city centre. It is proposed to create a detour road of 2x2 lanes on one edge of the city, with a radius large enough (circa 10 km) in order to remove the traffic transit outside the city centre and to determine an available area inside the detour road to be allocated afterward to development in continuity with the existing city. After completion of the ring road, numerous shops (garages for instance) will not need any more to be located along the city centre road. They should then be relocated along the detour road or in the industrial area outside Tataouine city centre. The second possibility is better since it will lead to the creation/expansion of this area.</p> <p>5. Tozeur The city of Tozeur also faces the transit by trucks going to Hazouat, in particular for the petroleum industry (information obtained during P/C meeting in Tozeur).</p>																								
Action Plan																								
Actions	Relevant organizations	Role																						
- Determine alignment of the ring road	- Min. Equipment - DRE - Cities concerned	- Min. Equipment and DRE to undertake corresponding studies																						

- Secure and buy land	<ul style="list-style-type: none"> - Min. Domains - Min. Environment (supervision of Environmental Impact Study) - Road traffic police - ODS/S3T 	- Min. Domain in charge
- Finalize studies and tending		- Min. Equipment + DRE based on final alignment + support of consultant if necessary.
- Supervise the works		- Idem or with external consultant
- Re-establish existing networks, signaling		- In connection with respective cities (<i>recollement des réseaux</i>) : roads, water, electricity, utilities, signalization panels
- Commission the road		- Open to general traffic (support of police and national guard)
- Maintain the road		- Min. Equipment + cities
Indicator		Risk
<ul style="list-style-type: none"> - The land is secured /reserved - The works are finished - The new road is commissioned - Road safety is good on the new road 		<ul style="list-style-type: none"> - availability of land - delay in financing of works - problems of road safety appearing after commissioning the infrastructure

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-9	Development of an airport in Tataouine governorate	
Intervention Area	Governorate of Tataouine	Implementing agency	Min. Transport/OACA
Description			
<p><u>Note 1:</u> This development can be foreseen only in the medium-long term, once both Djerba and Tozeur airports will have recovered their level of passengers of 2008 and stabilized their activity.</p> <p>Existing airports in South Tunisia (Djerba, Gabès, Gafsa and Tozeur) are in fact all located along the same East-West line, far from Tataouine, Médenine, and far from the tourist areas of the South (<i>ksour</i>, Sahara region...).</p> <p>An airport located in Tataouine governorate (preferably south from Tataouine) could increase the servicing of this area and suppress (if sufficient number of connections) the necessary time to travel to the Djerba airport (at present the main airport in South Tunisia). In addition, it might serve a large catchment area of customers, expanding up to western Libya. Else, the development of the South part of the region, for touristic or business purposes, would benefit from this facility (quicker connections with Tunis/with Europe).</p> <p>In addition and unlike the airports of Gabès and Gafsa, Tataouine governorate airport would not be located at direct proximity of a bigger airport infrastructure (Djerba and Tozeur respectively). Therefore, it could develop its own clientele.</p> <p>Studies can already be made regarding the potential of this infrastructure in terms of number of customers and quantity of freight, and on the locations which could be suitable for this infrastructure.</p> <p><u>Note 2:</u> Airports create opportunities of development during their construction and they can also provide a large variety of jobs for their operation and maintenance.</p> <p><u>Note 3:</u> In June 2015, the Prime minister has announced that the airport of Remada, located around 80 km south of Tataouine city, at present a military airport, would be adapted in order to also allow civil air traffic.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Determine the status, size and position of the airport	- Ministry of Transport - OACA (civil aviation and airports authority) and related bodies - MDICI/ODS/S3T - Min. Domains - Min. Environment	- Min. of Transport (DGAC) and OACA determine the best technical suitable positions, the overall size, then the site is selected based on multi-criteria analysis (accessibility, cost, support to industry, environment). S3T attends. A choice has to be made between national and international type of airport (customs area, airlines connections)	
- Secure the land	(supervision of Environmental Impact Studies)	- The land is reserved. No other use possible. OK with environmental constraints	
- Realize studies of clientele and costs	- Min. Equipment	- Independent study to confirm or infirm the technical and economic feasibility of the infrastructure	
- Take decision on economic and technical feasibility	- City of Tataouine - Business support organizations	- States, Tataouine governorate, city of Tataouine decide pending on the conclusions of the study.	
- If yes, buy land	- Auditing company specialized in consultancy of air transport issues	- The land is bought by the ministry of domains (same status than other airports)	
- Realize studies for terminal, tracks and facilities	- OACI (International	- Ministry + OACA + specialized consultant (engineering company specialized in airports)	

- launch tenders	organization for civil aviation - Ministry of Tourism - Promotion agency (international level)	- Ministry + OACA launch the tenders for realization of the airport (tracks, terminal, aerial facilities, general and commercial facilities)
- Supervise the works		- Ministry of Transport + OACA + specialized consultant
- Prepare servicing of the airport (access roads, other networks)		- OACA+ Min. Equipment + min. industry (roads and other networks of liaison with the surrounding territory)
- Promote the airport towards airline companies, freight carriers, tour operators and shop operators/		- Local authorities in liaison with the ministry of Tourism contract with a promotion agency to promote Tataouine destination both in Tunisia and on the international scene. Teasing of the airport and selection of carriers.
- Obtain authorizations		- Process to be implemented by OACA.
- Commission the infrastructure		- Grand opening, inclusion of the destination "Tataouine" in the timetables of at least one airline (national carrier) with at least 3 passenger connections per week (3 in and 3 out)
- Operate, maintain and develop the airport		- More carriers, more flights, more passengers, more non aerial activity (trade in shops, transport of freight, more tours picking up passengers at the airport).
Indicator		Risk
- A site exists - The viability of project is confirmed - The facility is constructed - The facility is commissioned - The operations start - The number of passengers/quantity of freight increase - the number of services increase - The number of connections increase		- No site suitable - Project implemented despite a wrong feasibility study - Change of overall economic conditions unfavorable for air transport, for national carrier - Decrease in tourist transport to Sahara or to Tunisia

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-10	Construction of a 2x2 lanes bridge between Jorf and Ajim	
Intervention Area	Governorate of Médenine	Implementing agency	Ministry of Equipment (or PPP)

Description

The project of construction of a on the south-west part of the Djerba island exists since a long time:



Source: Wikipedia

Figure 1-10-1 Djerba Island and connections to mainland

Djerba Island is served by its South-east by a road called “*Route romaine*” (Roman Road) built over an isthmus of land just aside the previous (and historic) roman road. There is another access by ferry by the South-West at the city of Jorf. The ferry trip takes around 30 minutes for a 2.5 km trip (circa 5 km/h).

The replacement of this servicing by ferry by a fixed link would considerably improve servicing of the Djerba island (continuous service H24, all year, at around 70 km/h, independently of maritime conditions and of availability of ferries). An average common waiting time of 3 hours during the summer period is often stated. This would be at the image of the replacement of Radès - la Goulette ferry in Tunis by a bridge in 2009, which allowed quick development of the area.

This new bridge, combined with 2x2-laning of the existing *Route romaine* under the financing of the ministry of Equipment²³, would create a continuous link on the littoral from Gabès to Zarzis and considerably reduce traffic time from Gabès to the Djerba airport and to all facilities in the area.

On the Ajim side, the abutment of the bridge should be located away enough from the city centre, since most of the traffic is transit traffic, stopping at present only due to waiting lines²⁴ before crossing the strait.

The study of the bridge has to be implemented taking into consideration the fact that its length would be of approximately 2,700 to 3,500 meters, pending on the location of the abutments on the two sides. The draught is relatively small (2 to 4 m on 75% of the distance) except on a section which is said to be 200 to 400 m long (length to be confirmed, depth around 15m, to be confirmed), this deeper portion corresponding to an old submarine oued nearby the city of Jorf.

²³ The present road is only 2x1 lane, 3.5 meters wide, and is damaged by the transit of cars and heavy trucks. The project implemented by the *ministère de l'Équipement* consists to expand this road to a 2x2-lanes roads.

²⁴ In addition to be usually long (sometimes more than 1 hour), the waiting time is uncertain since buses have priority over the waiting cars and pass over the waiting line upon their arrival. Then cars have to wait additional time for the next available ferry.

Due consideration has to be made to the natural site, openings in enough quantity should be created in order to maintain proper water flow and facilitate the streams in the Boughrara gulf area²⁵. Most of the boats in the gulf being fisher boats the air draft (*tirant d'air*) should be relatively limited (to be confirmed by additional studies, pending on local regulatory specifications)

A financing from EIB has been requested in order to study this project under a PPP scheme (decision of EIB waited). One problem is the low direct income from the ferry business since the tariff is 800 *millièmes* of a dinar (0.8 TND) for a car. In addition, lots of users do not pay or pay only part of their transport cost and the service as a whole is subsidized by the State by a global amount (see on this issue proposal for project **TR 3-1**).

A system based on user-pay revenue has to take this fact into consideration, since a too important hike in the fees may have reverse effect on the users or at least generate important protests.

If we consider as a reference the Radès bridge in Tunis (1630m viaduct+260m main bridge +1600m viaduct and access roads) of a total length of 3,500 m for an estimated construction cost of circa 80 million EUR in 2009, we come to a funding envelope of the same level, pending on monetary actualizations. The cost of the studies should be around 5% of the cost of the infrastructure, according to local sources and to the fact that this project does not seem to contain significant technical difficulties.



Figure TR 1-10-2 Waiting line (off-season)



Figure TR 1-10-3 Priority to buses



Figure TR 1-10-5 Ferry



Figure TR 1-10-6 Ferry
(view of available inner space)



Figure TR 1-10-7 Opening by bridge on
the *Chaussée romaine*



Figure TR 1-10-8 Fisherman's boats in
the port of Boughrara

²⁵ There is already one bridge on the *chaussée romaine* (length 160m) built in 2004-2006 (see above picture).

Possible design for the new bridge (keys road in Florida, USA):



Or a different shape (tourist road in Norway):



If considered as a piece of art, the bridge may attract tourists, from abroad and also all year long from whole Tunisia (possibilities of museums, shops at 2 sides, departures for boat trips around the Boughrara gulf).

Therefore, beyond its technical utility as a road link, the bridge may ultimately become a landmark of the area and a milestone of its development. Hence, it has to be included in a broader perspective of development of the island as a whole and of the preservation/promotion of its unique heritage.



(as a reminder: basically, the purpose of this bridge is to facilitate and speed up the existing traffic from Jorf to Ajim, and to facilitate the life and work of the inhabitants of the area having to commute regularly to and from the Djerba island, its business and tourist areas and its airport in particular).

In any case, this proposal for project of bridge El Jorf- Ajim is a prerequisite for the development of the area and of South Tunisia as a whole if we combine it with widening to 2x2 lanes of trunk roads (proposals for projects **TR 2-12** to **TR 2-16**).

Note:

The cost of the project of bridge can be subject to significant changes, pending on the exact position of the two abutments, of the air draft and pending to the method of construction of the low-height part of the bridge, with a possible embankment on part or total of this section.

Action Plan		
Actions	Relevant organizations	Role
- Decision on the procedure: State project or PPP	- Ministry of Equipment - DRE Médenine	- Upstream decision on principle on financing of the infrastructure (if PPP creation of a Special Purpose Company SPC)
- Determination of alignment of the bridge	- Consultant specialized on PPP - Governorate of Médenine	- Positioning on abutments on both sides (the bridge should not arrive in city centers since cars travel at high speed)
- Determination of the profile of the bridge	- Cities of El Jorf and Ajim - Ministry of Environment (supervision of Environmental Impact Study)	- Embankment or low height bridge when 3-4m of depth, <i>tirant d'air</i> (air draft) for an elevated part over the oued and maybe at another place near Ajim, with respect to the natural environment of the bay
- Technical studies (toll barrier or not at 1 side) and tendering	- Ministry of Agriculture and Fisheries (fishing industry)	- Technical studies of the bridge + tolling facility if toll (idea supported by the consultant since lots of seasonal traffic is not paying taxes for maintenance)
- Supervise the works	- S3T	- Min. Equipment + ad hoc service DRE Médenine+ specialized consultant
- Commission the bridge		- Official opening (state, region, cities)
- De-commission the ferry. Reallocate staffs		- Possible re-allocation of the staff (Min. Equipment) in the new structure?
- Operate and maintain the bridge		- Operation in safety and comfort for the users, with respect of the environment
Indicator		Risk
<ul style="list-style-type: none"> - Choice of system (State, PPP) is made - If PPP, financing of project is completed - Studies are finalized - Bridge is constructed - Bridge is open to traffic - Growth of traffic (measured by tolling facility) crucial for the level of profitability of the PPP financing scheme 		<ul style="list-style-type: none"> - If PPP, not enough financing available to cover construction + repayment periods - Geotechnical or bathymetric problems - Environmental problems - No growth of traffic compared to ferries - Road safety problems for bridge users (including pedestrians and 2-wheelers)

Strategy	TR-1	Increase the possibilities of mobility	
Project	TR-1-11	Two urban bridges in Gabès city	
Intervention Area	Gabès City Centre	Implementing agency	DRE Gabès
Description			
<p>This project is linked with the project of urban reclaim mentioned in proposal for project TR-1-6:</p>			
			
<p>Figure TR 1-11-1 Planned bridges (red arrows) in the reclaimed area near Gabès oued</p>		<p>Figure TR 1-11-2 Existing bridge of circa 250m (blue arrow on figure 47)</p>	
<p>The reclaimed area is now landlocked and bridges need to be built in order to improve its servicing. The existing bridge downstream the area (above picture) accommodates a heavy traffic. It could hardly support additional car movements.</p> <p>The building of two new bridges of 1x2 or 2x2 lanes over the oued pending on planned traffic (simultaneously or consecutively) would greatly improve servicing of the area. As a result of this urban renewal, the city would “move” toward its southern part.</p> <p>The cost of one 250 meter PC girder bridge can be estimated at first glance at 30 million TND (1,800 MJPY)</p> <p><u>Note:</u> one of the bridges can be larger and its cost more expensive if it has to accommodate the new LRT <i>métro</i> line pending on the route still to be defined (see proposal for project TR 1-5).</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Scheduling of the project (1 bridge at a time, or 2 bridges simultaneously)	<ul style="list-style-type: none"> - Ministry of Equipment - DRE Gabès - Min. Interior - City of Gabès - Min. Environment (Environmental Impact Study) - Sotragames and authority for public transport in Gabès (TAGR) if bridge also for the “metro” line - S3T 	- Pending on development of the area and on cost saving issues if these 2 similar bridges are realized at the same time or in continuity (decision DRE)	
- Technical studies and tendering		- DRE Gabès + specialized consultant. Consideration on pedestrians and 2-wheelers	
- Supervise the works		- DRE Gabès + specialized consultant	
- Commission the bridge(s)		- City of Gabès	
- Operate and maintain the bridge		- Technical services of city of Gabès + support DRE if necessary	
Indicator		Risk	
<ul style="list-style-type: none"> - The decision on scheduling of works is taken - The bridge is built/The bridges are built - The bridge(s) is (are) open to traffic 		<ul style="list-style-type: none"> - The bridge is not appropriate to the evolution of the traffic - Road safety/ pedestrians safety problems induced by the design of the bridge(s) 	

Sector	Strategy	TR-2	Increase the intensity of mobility			
	Plan		Actions	Term	Cost	
Infra	a) Institutional and human capacity development plan	—	—	—	—	
	b) Facility and infrastructure development plan	TR-2-1: Creation of <i>Voies express</i> (express roads) by widening roads to 2x2 lanes	<ul style="list-style-type: none"> - Identification of the route - Securing the land - Detailed technical, economic and environmental study - Decision - If yes, purchase the land - Detailed technical studies, tendering - Supervising the works - Commissioning the new road - Maintaining the road 	Various	See 3.7.10	
		TR-2-2: Program for the suppression of bottlenecks (roundabouts, traffic lights, left turns, flyovers...)	<ul style="list-style-type: none"> - Census of the projects to be considered under this category - Definition of order of priority by corresponding entities with support from min. Equipment, min. Transport, ONSR and S3T - Realization of feasibility studies and IES - Request for financing (project by project) - Detailed studies and tendering - Supervision of works - Commissioning of the new infrastructure - Definition and financing of maintenance issues 	Short	n.a	
		TR-2-3: Improving the quality of vehicles of the public transport companies	<ul style="list-style-type: none"> - Census of vehicles - Determination of 10% of vehicles in most critical condition (age, kilometers, pollution, consumption, general status) - Replacement of these buses and coaches by new vehicles or vehicles of less than 5 years age - Study on customers (actual, potential) - Study on overcrowded vehicles in urban areas - Plan for purchase new vehicles (50 seats, 30 seats capacities or equivalent) - Validation of plan by AOT - Purchase (yearly phasing, but grouped for the four companies, more quantity, better prices) - Commissioning of vehicles - Progressive replacement and rejuvenation during the following years 	Short	n.a.	

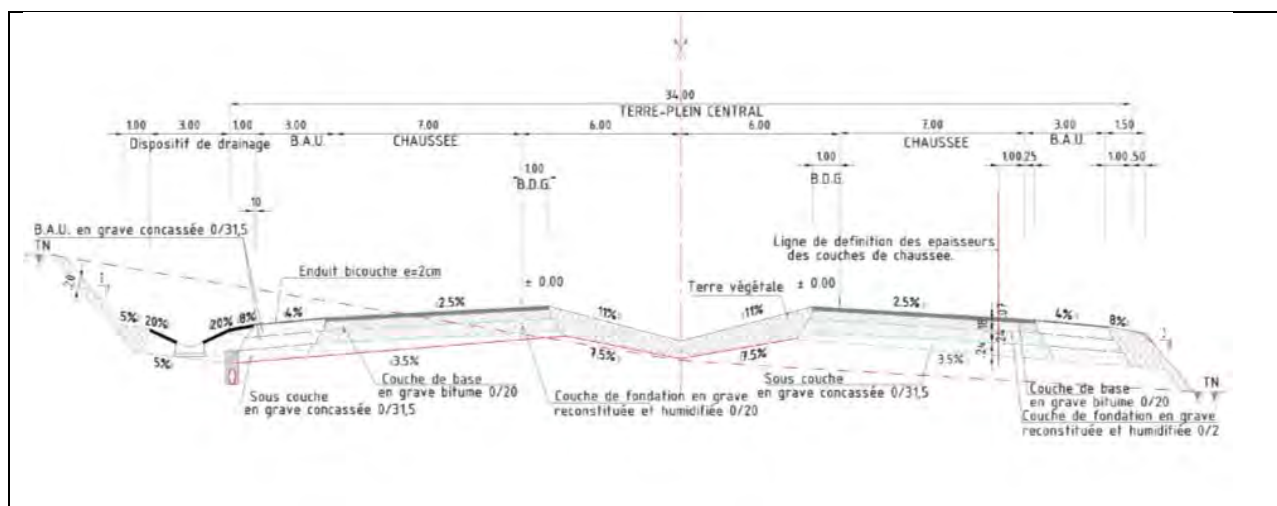
		<p>TR-2-4: Replacement of old SNCFT passengers wagons by new ones and audit of the locomotives</p>	<ul style="list-style-type: none"> - Census on rolling stock, for passenger wagons and for locomotives - Replacement of passengers wagons over 20 years and of 10% in most critical condition by new ones or ones of less than 5 years of age - Study on rail customers (actual, potential) - Plan for purchase of new wagons - Validation of plan by SNCFT - Phased purchase and commissioning of wagons (in common with other regions of Tunisia) - Progressive replacements and rejuvenation during the following years 	Short	n.a.
c)	Financial and investment plan	<p>TR-2-5: Other main roads -Continuous improvement via Fund</p>	<ul style="list-style-type: none"> - Creation of the Fund - Creation of an executive committee / Board - Feeding of the Fund - Definition of a standard request and of a procedure of assessment (<i>systeme de prise en consideration</i>) - Detailed study on costs and advantages of a project, including environmental evaluation if necessary and property related aspects (secure part of land if necessary) - Decision by consensus on funding (quarterly meetings) - Buying the land if necessary - Technical studies, tendering - Supervising the works - Road safety inspection prior opening - Commissioning the improvement tool - Include in maintenance 	Short	n.a.

Strategy	TR-2	Increase the intensity of mobility	
Project	TR-2-1	Creation of “Voies express” (express roads) by widening routes to 2x2 lanes	
Intervention Area	All South Tunisia	Implementing agency	Min. Equipment
Description			
<p>The program will be implemented on the following routes, pending on real traffic measured by continuous monitoring (threshold for intervention to be set and prioritization to be made between the routes proposed for enlargement, with consideration proposed in particular for the roads with most important traffic, black spots and high percentage of heavy goods vehicles (HGV) in the traffic²⁶):</p>			
	Route (tentative, to be confirmed) (sorted by growing number of classification)	Length (km)	Cost (M TND)
1	GP1 – Sfax-Gabès section	137	620
2	GP1 – Gabès-Médenine section	73	330
3	GP1 – Médenine-Ben Guerdane	77	350
4	GP3 - Gafsa-Tozeur	93	420
5	GP14 - Road corridor Gafsa-Sfax	197	890
6	GP15 - Road corridor Gafsa-Gabès	149	670
7	GP15 - Axis Gafsa- Algerian border	107	490
8	GP16 - El Hamma-Gabès	20	90
9	GP16 - Kébili-El Hamma ²⁷	100	450
10	GP19 – Tataouine-Médenine	49	220
11	GP19 – Tataouine-Remada-Dehiba	127	571.5
12	C107 – Mareth- New bridge	47	220
13	C108 - New bridge – Médenine	55	250
14	C 111 – Tataouine – Ben Guerdane	75	337.5
15	C116 – Djerba airport - New bridge	22	100
16	C117 – Zarzis-Djerba airport	52	240
17	C117 - <i>Chaussée romaine</i> section (ongoing)	n.a.	n.a.
18	R118 – Zarzis - A1 highway	30	135
	+ other routes to be considered for widening to 2x2 lanes pending on traffic.		
<p>These routes proposed for enlargement and transformation to “Voies express” represent a total length of more than 1,400 km, for a total cumulated cost of projects of almost 5.5 billion TND.</p> <p>Included in the program of widening main roads in South Tunisia to 4 lanes (in French: <i>voies express à 4 voies</i>, indicated with large red strips on the synthesis map of planned roads on page 3-50): creation of separated lanes in order to prevent head-on crashes (good for road safety and also easing traffic since safe overtaking of slow vehicles is much easier).</p> <p>The cross section of the <i>voie express</i> should be somehow similar to the one of a highway, see schema here after:</p>			

²⁶ - In the case of France for instance, the rules on enlargement of roads to 2x2 indicate a threshold for considering enlargement (*seuil de gêne* – threshold of embarrassment) of 8,500 PCU/day, with a code that 1 HGV =2 individual vehicles. See for instance: https://fr.wikipedia.org/wiki/%C3%89tude_de_trafic_d%27un_projet_routier

UVP, *unité véhicule passager*, in English « passenger car unit » or PCU.

²⁷ 6 Note: During the ministerial Council for Kébili Governorate of June 2015, the idea of a highway project from Gabès to Kébili has been mentioned.



Source: Tunisie Autoroutes

The width of each lane will be 3.75m. Maximum authorized speed will be general level of 90km/h, instead of 110 km/h permitted on highways. Possibility of mixed traffic with lower speed vehicles to be avoided when possible. Systematic monitoring (automatic radars) enforced.

More intersections with the general traffic are permitted (entrances-exits) compared to highways.

Action Plan		
Actions	Relevant organizations	Role
- Identification of the road	- Min. Equipment - DREs - Governorates - Cities along the road (existing, future)	- Most of reclaimed land is on both sides of existing road but improvements should be sought when possible, e.g. bypasses of villages and corrections of parts with poor alignment or losses of sight (<i>perles de tracé</i>).
- Securing the land	- Ministry of Domains - MDICI/ODS/S3T - Min. Environment	- The land is secured in order to avoid transfer of property or increase of land prices (maximum duration to be determined)
- Detailed technical, economic and environmental study	(Environmental Impact Study IES) - ONSR (national authority for road safety, under supervision of Min. Interior)	- The studies are implemented by a consultant under the supervision of ministry of Equipment (and DREs in charge on the road). IES is implemented
- Decision		- Decision to be confirmed under supervision of State and Governorate(s)
- YES, purchase the land		- Once bought, the land is transferred to the State domain (national roads)
- Detailed technical studies, tendering		- The ministry of Equipment/ DRE launches the study with a specialized consultant if necessary and tendering is prepared
- Supervising the works		- Min. Equipment supervises the construction works with the support of a consultant if necessary
- Commissioning the new road		- The new road is open to circulation (check of road safety issues to be made beforehand)
- Maintaining the road		- See project TR 3-4
Indicator	Risk	
- The alignment of improved road is defined - The works are launched - The new road is commissioned.	- Land is not available as wished - IES shows impossibility to proceed - New road shows unforeseen problems related to road safety	

Strategy	TR-2	Increase the intensity of mobility	
Project	TR-2-2	Program for the suppression of bottlenecks (roundabouts, traffic lights, left turns, flyovers...)	
Intervention Area	All South Tunisia	Implementing agency	Technical services of cities + support Min. Equipment if necessary
Description			
<p>This project is similar to projects TR 3-9 and TR 3-10 (see after) which relate to continuous improvement of roads in cities and on roads (mainly in cities pending on traffic). It differs by the size of projects: more important duration of works, amounts and consideration project by project of the operations to be launched (amounts and necessity may vary pending on traffic and technical local conditions).</p> <p>Each operation under this theme should be assisted/supervised by S3T (including technical aspects and maintenance).</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Census of the projects to be considered under this category	- Cities in South Tunisia - Governorates - Min. Equipment and DREs	- Establishment of a "long list" of individual project which can be proposed to financing by Tunisia, local authorities or Partners to development (ODA agencies)	
- Definition of order of priority by corresponding entities with support to Min. Equipment, Min. Transport, ONSR and S3T	- Min. Transport and DRTs - ODS/S3T - Min. Environment (environmental impact study IES) - ONSR(road safety issues)	- Definition of a short list of the projects which are the most urgent to be implemented, based on various criteria (including the number of persons concerned by the project and the improvements expected in terms of facilitation of traffic and of road safety.	
- Realization of feasibility studies and IES		- Technical definition of the project to be realized, verification of conformity of environmental criteria if necessary (IES)	
- Request for financing (project by project)		- Support of S3T to all authorities in order to create a file which comprises all necessary elements for the presentation to potential funding authorities	
- Detailed studies and tendering		- Once funding entity found, implementation of the studies by consultant and tendering	
- Supervision of works		- By a specialized consultant, under supervision of the technical Department of the city + S3T + DRE if necessary	
- Commissioning of the new infrastructure		- Going to traffic. Test of road safety features (<i>inspection de sécurité routière</i>) prior to commissioning.	
- Definition and financing of maintenance issues		- The infrastructure is handed over to the local authority, with a plan set for maintenance and corresponding entity in charge (S3T assists the process)	
Indicator		Risk	
<ul style="list-style-type: none"> - The census is made, S3T has a copy - The short list is made - Projects are financed/ funded on a case by case basis - The new infrastructure is commissioned + maintained 		<ul style="list-style-type: none"> - No common understanding for the definition of the short list (each project competes with the others) - No clear definition of responsibilities for maintenance - Problems on road safety on the new infrastructure 	

Strategy	TR-2	Increase the intensity of mobility	
Project	TR-2-3	Improving the quality of the vehicles of public transport companies	
Intervention Area	All South Tunisia	Implementing agency	Min. Transport

Description

Several public transport companies operate under the umbrella of the ministry of Transport. Each one covers one or more governorates of South Tunisia:

Table 2-17-1.: bus companies in South Tunisia

Name	Governorates
SNTRI <i>Société Nationale de Transport Interurbain</i>	All South Region (national level) Continuity with SNCFT in Gabès station
SRT Gabès (Sotreg Ames)	Gabès, Kébili
SRT Gafsa (El Kawafel)	Gafsa, Tozeur
SRT Médenine.	Médenine, Tataouine

(SRT : Société régionale de transport)

These companies possess buses that are maintained with care, but lots are quite old and need to be replaced, with effects on increase of comfort (hence more clients) and on reduction of pollution.



Fig 2-3-1 Bus of SRT Gafsa stationed in Tozeur



Fig 2-3-2 Japanese bus under repair at the workshop of SRT Médenine

The present project aims to facilitate and speed up replacement by financial initiatives covering up to the total cost of vehicle brought on site, pending on financial possibilities of donors (obtaining some vehicles for free, reductions on public tariffs, systems of leasing, better prices for some models, etc.).

Public transport needs a sharp increase in terms of capacity in seats offered and in number of vehicles in order to be in a position to match potential demand (+40% of seats estimated by the Regional Directorate of Transport in Kébili, so in this governorate from an actual size of 50 up to 70 coaches).

Action Plan

Actions	Relevant organizations	Role
- Census of vehicles	- Ministry of Transport - DR Transport for the six governorates	- Update of data on parks of vehicles, for each AOT (copy to S3T)
- Determination of 10% in most critical condition (age, kilometers, pollution, consumption, general)	- ODS/S3T - SNTRI	- Suppression of the buses and coaches which are the less performing (10% tentative, systematic). Their spare parts can be reused for other buses

status)	<ul style="list-style-type: none"> - SRT Gabès (Sotreg Ames) - SRT Gafsa (El Kawafel) SRT Médenine. 																																	
- Replacement of buses and coaches by new ones or ones of less than 5 years age	Authorities responsible for public transport on local scale (AOT, up to 15):	- Selection of maker common for all AOT in order to get the better commercial and financial offers																																
- Study on customers (actual, potential)	<table border="1"> <thead> <tr> <th>City</th> <th>Category</th> </tr> </thead> <tbody> <tr> <td>Gabès</td> <td>1</td> </tr> <tr> <td>Gafsa</td> <td>1</td> </tr> <tr> <td>Djerba</td> <td>1</td> </tr> <tr> <td>Médenine</td> <td>2</td> </tr> <tr> <td>Tataouine</td> <td>2</td> </tr> <tr> <td>Ben Guerdane</td> <td>3</td> </tr> <tr> <td>Douz</td> <td>3</td> </tr> <tr> <td>El Hamma</td> <td>3</td> </tr> <tr> <td>Kébili</td> <td>3</td> </tr> <tr> <td>Mareth</td> <td>3</td> </tr> <tr> <td>Tozeur</td> <td>3</td> </tr> <tr> <td>Zarzis</td> <td>3</td> </tr> <tr> <td>Metlaoui</td> <td>4</td> </tr> <tr> <td>Sned</td> <td>4</td> </tr> <tr> <td>Souk El Ahed</td> <td>4</td> </tr> </tbody> </table>	City	Category	Gabès	1	Gafsa	1	Djerba	1	Médenine	2	Tataouine	2	Ben Guerdane	3	Douz	3	El Hamma	3	Kébili	3	Mareth	3	Tozeur	3	Zarzis	3	Metlaoui	4	Sned	4	Souk El Ahed	4	- What are the wishes of customer (lines, schedules, tariffs packages...)?
City	Category																																	
Gabès	1																																	
Gafsa	1																																	
Djerba	1																																	
Médenine	2																																	
Tataouine	2																																	
Ben Guerdane	3																																	
Douz	3																																	
El Hamma	3																																	
Kébili	3																																	
Mareth	3																																	
Tozeur	3																																	
Zarzis	3																																	
Metlaoui	4																																	
Sned	4																																	
Souk El Ahed	4																																	
- Study on overcrowded vehicles in urban areas		- What are the most critical parts/ hours of the network when the quality of services is not optimal?																																
- Plan for purchase new vehicles (50 seats, 30 seats capacities or equivalent)		- Plan for progressive renewal/increase of the fleet pending on the requests of the customers																																
- Endorsement of plan by AOT		- Endorsement of plan by AOT pending on funding and financing plan. Endorsement by the ministry of Transport (new lines, positioning of bus stops, etc.)																																
- Purchase (yearly phasing, but grouped for 4 companies, more quantity, better prices)		- Yearly purchase by AOT, if possible in common, in order to build up a progressive plan of replacement of the buses (<i>lissage des remplacements</i>)																																
- Commissioning of vehicles		- Vehicles are adorned at the networks colors and put into service (promotion to be made at this occasion). Smaller vehicles for new lines, complements at peak hours or replacement of large vehicles during schedules with less number of customers																																
- Progressive replacements and rejuvenation during the following years	<p>1: over 150,000 inhabitants 2 100,000 – 150,000 inhab. 3: 50,000 -100,000 inhab. 4: 30,000 -50,000 inhab.</p>	- System of progressive replacement of the fleet in order to decrease the average age of the fleet and to increase progressively the number of vehicles available on the network.																																
Indicator		Risk																																
<ul style="list-style-type: none"> - The average age of fleet of vehicles decreases (objective of optimal age to be fixed by each AOT) - More passengers on the network - More kilometers of buses on the network - More trips (traveler/km) on the network - More income from transport for the AOT 		<ul style="list-style-type: none"> - No increase on passengers - Increase on passengers and trips, but no increase of income enough (tariff policies, special and reduced rates, etc.) to compensate the cost of purchase of new vehicles and the operational costs (minimum share of the cost to be borne by the users and the corresponding subsidies ex. schoolchildren) 																																

Strategy	TR-2	Increase the intensity of mobility	
Project	TR-2-4	Replacement of old SNCFT passengers wagons by new ones and audit of the locomotives	
Intervention Area	Governorates of Gabès, Gafsa, Tozeur	Implementing agency	SNCFT
Description			
<p>In addition to the actions on tracks and infrastructure, focus should be put to the improvement of materials, since some of the transport passenger cars date back from 1982-1984.</p> <p>With this increase of level quality of the equipment and of the transport speed with northern cities (Tunis, Monastir ...), new commercial trains could be considered, as for instance an express train Tozeur-Tunis.</p> <p>Further study has to be implemented in order to know the number of wagons to consider in that scheme and if some locomotives could benefit from replacement or from an in-depth refurbishment.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Census on rolling stock, for passenger wagons and for locomotives	<ul style="list-style-type: none"> - Ministry of Transport - SNCFT - MDICI/ODS/S3T - Ministry of Tourism - Governorates of Gabès, Gafsa, Tozeur - (Other governorates participate through ODS) 	<ul style="list-style-type: none"> - Determination of the condition of rolling stock. Specific enquiries on locomotives (not the same characteristics, constraints and maybe various possibilities of allocation of engines, not addressed) 	
- Replacement of passengers wagons over 20 years and of 10% in most critical condition by new ones or ones of less than 5 years age		<ul style="list-style-type: none"> - Minimum replacement compulsory of outdated rolling stock (financing to be discussed with SNCFT since a maintenance plan should exist for the passenger wagons (and locomotives), 	
- Study on rail customers (actual, potential)		<ul style="list-style-type: none"> - See project TR 3-7 - Possible to include an express service Tozeur--Tunis 	
- Plan for purchase new wagons		<ul style="list-style-type: none"> - To be established taking into consideration the existing network and rolling stock but also the panned network (and rolling stock if relevant). 	
- Endorsement of plan by SNCFT		<ul style="list-style-type: none"> - SNCFT owns the network and operates it. 	
- Phased purchase and commissioning of wagons (in common with other regions of Tunisia)		<ul style="list-style-type: none"> - Joint purchase in order to obtain better prices. 	
- Progressive replacements and rejuvenation during the following years		<ul style="list-style-type: none"> - The network enters into a phase of scheduled replacement of material, hence decreasing the overall age of the rolling stock and increasing the quality of the supply (new wagons: more seats, less weight, better layout, etc.) 	
Indicator		Risk	
<ul style="list-style-type: none"> - The census is made - The oldest and more outdated rolling stock is replaced - A purchasing plan is established and implemented - More customers on the network, more often 		<ul style="list-style-type: none"> - No possibility to mix new vehicles and old ones for technical reason (necessity of complete replacement) - No increase in the number of customers despite this improvement 	

Strategy	TR-2	Increase the intensity of mobility		
Project	TR-2-5	Other main roads - Continuous improvements via the creation of a Fund		
Intervention Area	All south Tunisia (outside cities)	Implementing agency	Min. Equipment	
Description				
<p>Unlike the previous case where the project can be clearly identified and prioritized for each operation, this category comprises various types of works, all necessary at various periods of a road life. The ministry of Equipment is the appropriate body to determine the priorities on this issue, thanks to its regional directorates.</p> <p>The point is to have the main road network always fully operational and to improve its quality as much as possible. The quality of the road surface evolves with time, as per traffic and other conditions. If no regular maintenance implemented, the road surface deteriorates then disintegrates.</p> <p>The duration of the cycles of maintenance is determined on a case-by-case basis (as an average, first maintenance seven years after construction, extensive maintenance after fifteen years). This maintenance can be accompanied by works dedicated to improve road safety and quality, as for instance:</p> <ul style="list-style-type: none"> • Roundabouts (<i>rond points</i>) in entry-exist areas and nearby the gateways to cities; • Replacement of the calming humps (<i>gendarmes couchés</i>) by speed cushions (<i>coussins berlinois</i>)²⁸; • Rectification of alignments and suppression of loss of sight sections (<i>pertes de tracé</i>); • Creation of off-carriageway stopping areas for public transport: taxis, buses and <i>louages</i>; • Suppression of potential obstacles alongside the road; • Remediation of black spots (road accidents); • Widening of road lanes to 3.75 m (when necessary); • Drainage, dredging and remediation of blue spots (water accumulation); • Roadways repaving/restoring (small-size interventions); • Re-profiling (<i>reprofilage</i>) and upgrading the road surfaces; • All other features which may increase road safety and service life of the structure. <p>This is the purpose of this project. We propose the creation of a structure similar to a Road Fund, with the creation of a basket funding system managed by the ministry of Equipment and dedicated to these works. The ministry of Equipment will allocate the funding available in the basket pending on prioritization of needs.</p> <p>Reporting will be made to S3T (see project TR 3-2). No cumulated payment for one project may exceed 30% of the amount available in the basket funding at the beginning of year, and 50% of the remaining amount at the date of payment (percentages to be finalized in cooperation with the ministry of Equipment, set up in order to avoid that all available funding be allocated to one single operation).</p> <p>The basket can be alimeted by various entities and ODA agencies. In addition, the cost covered by the basket funding may cover only part of the cost of the project to be implemented, other sources of financing (State, governorates, cities, etc., may also be solicited on a case by case basis.</p>				
Action Plan				
Actions	Relevant organizations		Role	
- Creation of the Fund	- Ministry of Finance - Ministry of Equipment - ODS/S3T		- The Fund has to be officially created and duly registered to all relevant authorities. It should be exempted of taxes and levies.	
- Creation of an executive committee / Board	- Members of the fund: * ODA agencies * National State * Governorates (if trust funds possible inside the fund)		- The structure of governance of the Fund has to be established ex ante, at least at the level of the board. - Two important ministries: Finance (for the financial planning), Equipment (for the technical relevance of projects)	

²⁸ For more information please see : http://en.wikipedia.org/wiki/Speed_bump

- Feeding of the Fund	<ul style="list-style-type: none"> * Cities (if trust funds possible inside the fund) * Case by case funding entities (companies, ONGs, individuals) * ONSR 	- Crucial by State (if no other adapted system under the State budget), ODA agencies, others.
- Definition of a standard request and of a procedure of assessment (<i>système de prise en consideration</i>)		- A procedure has to be defined in the early stages of the structure in order to harmonize the nature, layout, information in the requests and to standardize the way of processing the requests, in order to avoid possible complaints afterwards.
- Detailed study on costs and advantages of a project, including environmental evaluation if necessary and land ownership related aspects (secure part of land if necessary)		<ul style="list-style-type: none"> - All studies have to be made beforehand on requests for funding. The decision is an OK to proceed the works and there should be no need for complementary studies; - (if so the decision is postponed and the project has to be improved in order to make a renewed request at a later stage).
- Decision by consensus on the funding (quarterly meetings)		- Decision is taken by a Commission, under the supervision of the Board (same members possible, case by case members (representatives of cities for instance). If no consensus the project is refused (there are enough projects to finance). If specific problem the board meets.
- Buying the land if necessary		- As for other projects. Since the surface area is often small, some owners may be reluctant to sell due to limited financial interest.
- Technical studies, tendering		- Made by DRE + specific consultants if needed.
<ul style="list-style-type: none"> - Supervising the works - Road safety inspection prior opening 		- Made by DRE or cities authorities (or specific consultant if specific feature type electric network). ONSR checks before opening if no problem related to road safety.
- Commissioning the improvement tool		- By min. Equipment or the city.
- Include in maintenance	- To be acted with min. Equipment or the city	
Indicator		Risk
<ul style="list-style-type: none"> - The Fund is created - The Fund has funding - The projects are selected and implemented 		<ul style="list-style-type: none"> - No money in the Fund - The process too complicated or at the contrary too lenient regarding the allocation of funds (funding agencies complain and do not continue to participate).

Sector	Strategy	TR-3	Increase the sustainability of mobility		
	Plan		Actions	Term	Cost
Infra	a) Institutional and human capacity development plan	TR 3-1: General accounting principles for public entities	<ul style="list-style-type: none"> - Create a project team among the key players - Discuss on issues and the points to be pointed out - Set a training module (2 half-days maximum) - Set the logistics of the training sessions (who, where...) - Create a contact desk for participants for questions (before, after session) - Implement - Evaluate by questionnaire sent to participants - Feedback discussion in the team and reporting - Modifications if necessary and start of a new cycle 	Short	n. a.
		TR 3-2: <i>Mission des Transports du Sud tunisien / South Tunisia Transport Taskforce (S3T)</i>	<ul style="list-style-type: none"> - The structure (S3T) is created - S3T is staffed - S3T holds its first meeting in ODS - S3T constitutes a documentation (database) and operates it - S3T holds regular meetings in the six governorates - S3T goes on site to supervise operations on a case by case basis - S3T reports to the authorities on a regular basis (quarterly) - S3T organize plenary meetings with stakeholders (every 6 months) - S3T publishes information online - S3T realizes small size strategic studies 	Short	n. a.
		TR 3-3: Census of existing transport studies and creation of a compiled transport development master plan in South Tunisia.	<ul style="list-style-type: none"> - Creation of a steering Committee - Elaboration of the terms of reference - Definition of the rights to access the information - Validation during plenary half-yearly meeting - Selection of a consultant - Determination of the entities which can provide relevant information - Creation of an organizational scheme to contact entities, collect and sort information - Definition of research tools and criteria - Collection of information - Computation of information - Indexation/storage of documents - Test of the database - Commissioning the database - Training of staff on how to obtain information on continuous basis and enter additional documents - Definition and start of the operational phase - Collect of documents - Feeding of the database - Maintenance of the database 	Short	n. a.

b) Facility and infrastructure development plan	<p>TR 3-4: Road network development (paved and unpaved roads) Part 2: Maintenance and improvement</p>	<ul style="list-style-type: none"> - Update on data on existing maintenance of the network, road by road - Prevision of maintenance costs and of their evolution for years n+1 to n+5 - Establishment of scenarios of maintenance pending on available budget - Discussion on systemic choices pending on scenarios (if considered necessary) - Creation of the Fund dedicated to maintenance and of its administrative entity - Coordination of the Fund 	Short - Mid	n. a.
	<p>TR 3-5: ITS system for roads and road database</p>	<ul style="list-style-type: none"> - Creation of a steering Committee - Definition of a "pilot DRE" which will host and maintain the <i>base de données routières</i> (BDR) - Definition of functions and specificities to be noted for the points (<i>informations à renseigner</i>) - Collection of the points on the road network - Computation and creation of the BDR - Operational phase: use the data as tools for decision - Regular update, improvements and check of the accuracy of the database 	Mid	n. a.
	<p>TR 3-6: comprehensive information system for public transport systems by bus</p>	<ul style="list-style-type: none"> - Creation of a steering Committee for all South Tunisia - Definition of a person in charge for each <i>gare routière</i>, for the supervision of installation and monitoring - Definition of a person in charge for each bus company for supervision of installation, monitoring, update and transmission of data to the <i>gare(s) routière(s)</i> in the perimeter of lines operated by the company + transmission to S3T - Installation - Commissioning - Operation - Maintenance - Regular meetings between users in order to exchange on best practices, improvements, etc. (<i>club d'utilisateurs</i>) 	Short	n. a.
	<p>TR 3-7: study of rail transport network for passengers/ freight in South Tunisia</p>	<ul style="list-style-type: none"> - Creation of the steering committee and setting of the terms of reference of the study - Selection of the consultant - Implementation of the study - Discussion of results and elaboration of strategies 	Short	n. a.
	<p>TR 3-8: Traffic and parking master plan program (<i>programme de plans de circulation et de stationnement</i>)</p>	<ul style="list-style-type: none"> - Definition of a proposition of common platform to be used to set up the Terms of reference (ToR) for the studies - Studies realized independently by each city with possible use of the propositions for ToR described above - Definition and implementation of policies by the cities - Sharing of experience between cities of South 	Short	n. a.

			<p>Tunisia: problems, best practices, innovative solutions, etc.</p> <ul style="list-style-type: none"> - Creation of a permanent group on sustainable mobility in the cities of South Tunisia 		
c) Financial and investment plan		<p>TR 3-9: Fund for roads improvement outside cities</p>	<ul style="list-style-type: none"> - Creation of the Fund and of its management structure - Mobilization of financing - Definition of a template request and of a procedure of individual assessment (<i>ystème de prise en considération</i>) - Decision on funding the projects - Studies, tendering - Supervision of the works - Commissioning - Include the new structure into the general maintenance scheme 	Short	Fund
		<p>TR 3-10: Fund for streets improvement in cities</p>	<ul style="list-style-type: none"> - Creation of the Fund and of its management structure - Mobilization of financing - Definition of a template request and of a procedure of individual assessment (<i>ystème de prise en considération</i>) - Decision on funding the projects - Studies - Tendering - Supervision of the works - Commissioning - Include in maintenance 	Short	Fund

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR-3-1	General accounting principles for public entities regarding public transport	
Intervention Area	All South Tunisia	Implementing agency	Min. Finances
Description			
<p>The present system of accounting does not permit easy understanding of the performances of the transport systems, since financial compensations are often grouped into one global “off balance” amount instead being split into corresponding sources of revenue. For example, instead directly compensating the share of transport not covered by schoolchildren²⁹, corresponding State support is included into a global balancing subsidy for the line/company. As a result, some transport services appear as being in deficit even if buses are packed.</p> <p>Action on the methods and training sessions should be implemented on this aspect for civil servants of ministries and for staff of State owned companies under the umbrella and the guidance of the ministry of Finance and of the ministry of Home Affairs.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Create a project team among the key players	<ul style="list-style-type: none"> - Ministry of Finance - Ministry of Home Affairs - MDICI/ODS/S3T - All ministries, in particular Equipment and Transport - All governorates - All bus companies, SNTRI and SRT - All <i>autorités organisatrices de transport</i> (AOT) (management, accounting Departments) 	- The project team is the node for implementing the project. It should comprise min. Finances, home affairs, ODS, a specialist of training, a professional expert in the domain (of a bus company or AOT for instance)	
- Discuss on issues and points to be pointed out		- Definition of the items to be addressed in the training module	
- Set a training module (2 half-days maximum)		- Definition of the training session, duration of agenda items, examples...	
- Set logistics of the training sessions (who, where...)		- Two possibilities: at a center place with several experts of a topic (ex. all bus companies) or in all governorates with participants from same geographical areas.	
- Create a contact desk for participants for questions (before, after session)		- Create a link which will work on a permanent basis and can serve as a helpdesk for additionally addressed issues and further improvements	
- Implement		- Groups with a maximum 20 persons to permit interaction between participants and with the lecturer	
- Evaluate by questionnaire sent to participants		- Feedback to make 2 to 3 months after the session: any implementation by the trainee? Difficulties?	
- Feedback discussion in the team and reporting		<ul style="list-style-type: none"> - At the level of the project team, based on the questionnaires and other feedbacks: good/bad points, improvements to make, additional items to address - Reporting to entities is made after each training session. 	
- Modification if necessary		- Feedback permits continuous improvement of	

²⁹ - In Tunisia, schoolchildren pay generally 10% of the price of their transport, the remaining part is covered by the State.

and start of new cycle		<p>training.</p> <ul style="list-style-type: none"> - The new cycle incorporates requested improvements. - Possibility to create circles of alumni for further thematic and technical exchanges: creation of groups of users by professional centers of interests at the local levels.
Indicator		Risk
<ul style="list-style-type: none"> - The project team is created - The training module is created - The training module is implemented - The feedback is good. Continuity and improvement. 		<ul style="list-style-type: none"> - Not possible to create a project tem - Local logistics not performing (Note: very low risk) - The training session is not matching participant's interests - Items not implemented by the trainees.

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR-3-2	Mission des Transports du Sud tunisien / South Tunisia Transport Taskforce (S3T)	
Intervention Area	All South Tunisia	Implementing agency	ODS in connection with Min. Equipment and Min. Transport
Description			
<p>It is necessary to build up a permanent structure in charge to:</p> <ul style="list-style-type: none"> - ensure a transverse follow-up and monitoring of the projects implemented; - report to the authorities of South Tunisia. <p>In order to ensure better monitoring of the infrastructure projects to be implemented in the six governorates of South Tunisia, we propose to create a “<i>Mission des Infrastructures du Sud tunisien</i>” (in English South Tunisia Transport Taskforce, or S3T), depending from MDICI/ODS, from the ministry of Equipment and from the ministry of Transport. Missions:</p> <ul style="list-style-type: none"> - Compilation and update of a regional Transport Infrastructure Development Master Plan for the six governorates of South Tunisia, based on compilation and coordination of the data provided; - Consultation for roads between governorates ; - Consultation for cross-border routes and for the links with North Tunisia ; - Follow up of suppression of bottlenecks and improvement of traffic in cities; - Collection, storage and publication of traffic related data (all modes) - Collection, storage and publication of transport environment related data (CO2 emissions, etc.). <p>The aim is to interact with the existing structures, not to replace them. The staff should then be comprised of 7 to 10 persons only (direction, management: 3, site follow-up of works: 2, database, Internet: 2). This structure could be based in ODS office in Médenine (support in logistics). The staff would be constituted by ODS staff and/or staff seconded by their ministries</p> <p>S3T will report on its activities at least twice a year during a meeting with representatives of all authorities involved, with the following proposed agenda:</p> <ol style="list-style-type: none"> 1) Update on the evolution of traffic (freight, passengers) in South Tunisia, all modes 2) Update on road accidents and on suppression of black spots 3) Ongoing improvements in transport infrastructure (progress reports) 4) Planned improvements in infrastructure, all modes (short term ST, mid-term MT, long-term LT) 5) Modifications having occurred in the planning and remediation measures taken or considered; 6) New proposals for improvement of infrastructure, all modes (ST, MT, LT) 			
Action Plan			
Actions	Relevant organizations		Role
- The structure (S3T) is created	<ul style="list-style-type: none"> - MDICI/ODS - Min. Equipment - Min. Transport - <i>Gouverneurs</i> of the six governorates, as representatives of the Tunisian State - Representatives of elected bodies (cities in particular) 		- An appropriate administrative framework (decree, other...) permits to create S3T (provisional name), defines the boundaries of its actions, authorizes its participation to meetings of several ministries and entities, indicates its logistics (hosted by ODS presumably), defines its missions and duties of reporting,
- S3T is staffed			- Permanent staff is determined (see description of the project), and a manager of S3T is hired, with sufficient technical level and administrative background to become a natural partner during her/his mission
- S3T holds its first meeting in ODS			- This kick-off meeting will enforce the existence of S3T (presentation of staff and of terms of reference of the actions towards main supporting authorities, MDICI, Min. Equipment and Min.

		Transport
- S3T constitutes a documentation (database) and operates it		- First phase of the action: gathering existing documentation with external support (see TR 3-3) due to the volume and variety of sources of documents. - This phase will permit to establish links with the persons in charge of the documentation in counterpart institutions, who will then become counterparts of S3T staff on a sustainable basis (feeding of information).
- S3T holds regular meetings in the six governorates		- S3T has to exist and to be on site on a regular basis.
- S3T goes onsite to supervise operations on a case by case basis		- S3T legitimacy rests in this type of work, vis-à-vis of authorities and of local stakeholders (see after)
- S3T reports to authorities on a regular basis (quarterly)		- S3T legitimacy rests in this type of work, vis-à-vis of authorities and of local stakeholders (see above).
- S3T organize a plenary meeting with stakeholders (every 6 months)		- This type of meeting is necessary to monitor progress, promote best practices and foresee future projects
- S3T publishes information online		- Lots of information put in common could be of interest for a large audience. Pending on confirmation and authorization from its counterparts and supporting authorities, S3T could become the place where available information is processed and supplied into informative/ promotional articles and distributed (magazine, online edition).
- S3T realizes small size strategic studies		- Pending on its expertise, S3T could realize upstream strategic studies for the authorities, if corresponding studies would not interfere with the monitoring tasks.
	Indicator	Risk
	- S3T holds its first meeting - S3T visits its counterparts in governorates - S3T holds its first meeting with stakeholders - S3T has constituted and manages its database of information - The system is sustainable - A magazine or equivalent product is published by S3T on transport development in South Tunisia	- S3T is not properly inserted in the landscape of transport and transport infrastructure in South Tunisia (all governorates, all ministries, all counterparts) - The knowledge inside S3T is not sufficient in order to build up an interesting counterpart - Due to difficulties of funding, S3T has to reduce its staff or its onsite presence.


Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-3	Census of existing transport studies and creation of a compiled transport development master plan in South Tunisia	
Intervention Area	All South Tunisia	Implementing agency	Supervised by S3T
Description			
<p>Numerous projects and reports in the domain of transport have been established by various institutions. They could constitute an important and relevant source of information / databank for the development of future projects. Unfortunately these materials (documents, maps, pictures...) are scattered among locations and entities and are often available on paper format only.</p> <p>The task of project TR 3-3 (to be implemented by a specialized consultant company) would be to establish a databank of all available reports on a digital format: acquisition of copies of existing reports, scan and digitization of documents if necessary, creation of an electronic library with a system of index.</p> <p>Considering the scale of this work, it is not possible that this project be realized by S3T alone (if created). But S3T could be in charge of providing data as a basis to the initial work, to supervise the work of a specialized consultant, and to increase the quantity of available data by collecting and processing all new documents available in the domain.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Creation of a steering Committee for this study	<ul style="list-style-type: none"> - S3T - MDICI - Min. Equipment - Min. Transport 	- Oversees the realization	
- Elaboration of the terms of reference		<ul style="list-style-type: none"> - What to collect/not to collect based on keys of selection to define - To which entities? Where? In which form? - Duration of the mission 	
- Definition of the rights to access the information		<ul style="list-style-type: none"> - Who will have access to the documents, for which purposes? Which security for the database? This step should permit to define the structure of the database based on the access rights. 	
- Validation during plenary half-yearly meeting		- Necessary to access information from all counterparts , to inform them on the progress, and maybe to be informed by a participant of additional available documents	
- Selection of a consultant		- Tendering process	
- Determination of the entities which can provide relevant information		- Review and if necessary complements, to the Terms of Reference on this aspect	
- Creation of an organizational scheme to contact entities, collect and sort information		- How to collect the information onsite (organization of missions, exploitation and digitations strategies)	
- Definition of research tools and criteria		- How to manage the database? (this task can be done in parallel with other tasks)	
- Collection of information		- Onsite missions	


- Computation of information		- Processing on electronic format
- Indexation/storage of all documents		- (<i>référencement</i>) Each document can be accessed directly through a set of key words
- Test of the database		- Testing phase
- Commissioning of the database		- The database can be accessed by appointed users (2 possibilities: remote access is possible or not)
- Training of staff on how to obtain information on continuous basis and enter additional document		- In addition to the exploitation of the existing documents, S3T staff has to be trained on the following issues: - How to processing new documents? - Which key words to enter for each document? - How many times a year to provide a document? - Who is the registered counterpart? etc.
- Definition and start of the operational phase - Collect of documents - Feeding of the database - Maintenance of the database		- Transfer from consultant to S3T of necessary knowledge and set of procedures in order to operate the database efficiently and on a sustainable basis.
Indicator		Risk
<ul style="list-style-type: none"> - The Steering Committee is created - The Terms of Reference are elaborated and validated by the stakeholders of S3T - The database is created - The database in operated on a permanent basis 		<ul style="list-style-type: none"> - Poor initial product (quantity of documents gathered, availability of information with research tool) - Insufficient feeding of the database due to inappropriate definition of the feeding procedures or lack of training of staff

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-4	Road network development (paved and unpaved roads)- Part 2: Maintenance and improvement	
Intervention Area	All South Tunisia	Implementing agency	Min. Equipment
Description			
<p>Note: this project covers the maintenance of roads to be built under the present Action plan, not their construction. Considering the number of parameters not yet determined, it is not possible to address totally adequately the issue. For instance: in order to increase activities, a paved link between El Borma and Bir Zar in Tataouine governorate shall be created (see proposal TR 1-2). This induces two issues in terms of road maintenance (and corresponding financing): (i) at which horizon in time and (ii) which level of maintenance to be foreseen?</p> <p>The same kind of question applies to trunk roads to be widened to 2x2 lanes³⁰. (see proposal for projects in Strategic theme TR 2-1): which consequences on the road maintenance budget ? (a factor 2 on the corresponding roads seems reasonable in first analysis)</p> <p>At present, the road network is maintained under the supervision of the <i>Directions régionales</i> of the ministry of Equipment, with a funding by Tunisian national budget. It seems reasonable to consider that the same organization of maintenance, which offers results of a good quality, should be maintained.</p> <p>The point is to allocate funding accordingly, which can be ensured on a sustainable basis through a sustainable financing either inside the budget (to be planned), or through extra budgetary resources like a road Fund of first or second generation.</p> <p>The present project aims to bring some elements of reflexion on this issue, in view of possible implementation. It shall be supported by the implementation of project TR 3-5 on the implementation of an ITS system for roads, based on a <i>banque de données routières</i>, road data bank of information on the roads and their maintenance.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Update on data on existing maintenance of the network, road by road	- Ministry of Equipment - Ministry of Finance	<p>- Establish a baseline of maintenance costs for the network for each governorate (operative areas of the DREs).</p> <p>- For instance: in 2013 the cost of road network maintenance for the main network (titre I) was: Total six governorates 4,565 million TND with Gabès 19.9%, Médenine 18.7%, Tataouine 15.1%, Gafsa 17.2%, Tozeur 14%, and Kébili 15%.</p>	
- Prevision of maintenance costs and of their increase for years n+1 to n+5		<p>- Prevision of budgetary requirements based on annual maintenance costs for existing roads + previsions for each coming year of increase of cost for maintenance following the commissioning of (i) new roads and (ii) of enlarged sections of roads (to be then maintained).</p>	
- Establishment of scenarios of maintenance pending on available budget		<p>- Establishment of various scenarios of expenses for maintenance, pending on available budget.</p> <p>- Check if maintenance can be properly implemented with available funding.</p>	
- Discussion on systemic choices pending on scenarios		<p>- The maintenance can be directly financed in a sustainable manner by the State budget (as before);</p>	

³⁰ The percentage of roads with separate lanes is at present of 4.4% in South Tunisia compared to 8.8% for the country in general.

		<ul style="list-style-type: none"> - There is a need for securing financing/ additional financing on a sustainable basis; - Establishment of a road maintenance fund (of second generation), secured from a fuel levy and taxes related to vehicles paid by road users.
- <i>(In that case)</i> Creation of the Fund dedicated to maintenance and of its administrative entity		- To be discussed and decided by the ministries of Equipment and Finance
- Coordination of the Funds		<ul style="list-style-type: none"> - Coordination between Funds of various nature - Road safety Fund based on income from operations of enforcement of regulations related to road safety and dedicated at first to the mitigation of black spots; - Funds for construction works: suppression of bottlenecks, improvements of the main roads, improvement of networks (i) in cities and (ii) in rural areas (various authorities concerned). These Funds should be financed by a system of basket funding; - The road (maintenance) Fund has no overlap with the other Funds above.
Indicator		Risk
<ul style="list-style-type: none"> - The road maintenance works can be financed on a sustainable basis within the national state budget, for all its components. - A road fund dedicated to maintenance is created. 		- Increase too important in maintenance costs/ in needs of financing for maintenance compared to available amounts of financing

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-5	ITS system for roads and road database	
Intervention Area	All South Tunisia	Implementing agency	Min. Equipment
Description			
<p>ITS (intelligent transport systems) should permit to have better knowledge of traffic, of allocations of expenses on a specific section of roads (maintenance, remediation works, etc.), and to display messages when necessary (travel time to next city, accidents, works on the road for instance).</p> <p>They are useful tools for road management and can be even more useful if interconnected with other similar features.</p> <p>If possible, this system could be interconnected with information systems of the public transport companies (real-time positioning of buses, average traffic speed on routes, etc., see proposal for project TR 3-6).</p>			
<p>Figure TR 3-5-1 Early warning system of Estimated waiting time for the El Jorf- Ajim ferry</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Creation of a steering Committee	- Main: Min. Equipment DRE of 6 governorates	- In charge to define the specificities of the project, the data to be informed and to follow implementation	
- Definition of a “pilot DRE” which will host and maintain the road database <i>base de données routières</i> (BDR)	- Partners: Min. Transport Min. Agriculture Min. Intérieur S3T	- The data have to be gathered and stored in one entry point to be defined inside the region	
- Definition of functions and specificities to be noted for the points - (<i>informations à renseigner</i>)		- With the support of external providers (survey companies) constitution of a database comprising two categories: regular points (same inter distance on network) specific points (road crossings, etc.)	
- Collection of the points on the road network		- Information obtained for these two categories of points.	
- Computation and creation of the BDR		- Data are stored and processed	
- Operational phase: use the database as tool for decision		- Data are used	
- Regular update, improvements and check of accuracy of the database		- The database has to be maintained / improved; - The accuracy of data has to be checked; especially during the starting phase; - Additional functions can be added upon request (if approved by Min. Equipment).	
Indicator		Risk	
<p>- The committee is created and has a mandate</p> <p>- The database of points is constituted</p> <p>- The database of points BDR is used as tool of decision (improvements, maintenance, new routes entered)</p>		<p>- No clear mandate for the steering committee: loose definition of tasks to be implemented (e.g. which specific points to be included)</p> <p>- BDR is not used as a tool for decision</p> <p>- BDR is not properly updated and the additional data not entered are missing for proper use after some years</p>	

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-6	Comprehensive information system for public transport by bus	
Intervention Area	All South Tunisia	Implementing agency	Companies of public transport by bus
Description			
<p>The information provided online by bus companies is very often updated and accurate, but is not always sufficient in terms of available data and not often used as a tool of management by these companies (real-time positioning of vehicles, number of passengers based on ticketing, etc.).</p> <p>The problem also consists in on-site information, like information boards and screens, etc. in the <i>gares routières</i> (bus stations). This information is not always updated and is displayed company by company, i.e. not comprehensive for the station with indication of all departures and arrivals, showing to passengers and to potential customers all available destinations and schedules in a user-friendly, harmonized and efficient manner.</p> <p>Real-time information must be comprehensive and accurate. Diffusion of this updated information in the <i>gares routières</i> must be improved.</p> <p>The purpose of this project is:</p> <ol style="list-style-type: none"> 1) to support the purchase of a system of comprehensive information (information board(s) + support electronics + maintenance) for each <i>gare routière</i> (more than one per governorate, number of such facilities to increase if traffic increases); 2) to provide incentives to the bus companies which, based on their own networks and constraints, will be in a position to select the system the most fitted to their needs. This system should allow the transmission of data on a common format for a common use (in particular to the <i>gares routières</i>); 3) Computation and update of corresponding data + link when necessary. <p>his system will have to be connected with the system(s) of the bus companies for permanent update, and has to be maintained on the spot in order to enter additional information on other users of the <i>gare routière</i> (if allowed to display).</p> <p>The point of the maintenance of the systems – informatics, electronics, mechanics if needed for the information panels - has to be addressed during the purchasing phase. Maintenance can be made by specialists of the bus companies or outsourced to a specialized company</p>		 <p style="text-align: center;">Fig TR 3-6-1 Tozeur, <i>gare routière</i> - Information point</p>	
Action Plan			
Actions	Relevant organizations	Role	
- Creation of a steering Committee for all South Tunisia	- Main: Ministry of Transport DRTs Bus companies: SNTRI, 3 SRT Private companies for tourism A3T, in charge of the <i>gares routières</i> S3T	- The steering committee will comprise the ministry of Transport , A3T, SNTRI, all public transport companies, a representative of Min. Tourism ³¹ and define features of information to be displayed in the <i>gares routières</i> and the “common grammar” necessary for the various STI systems of the bus companies (data on same format for exchange)	

³¹ The development of tourism by public and private bus transport can be promoted on this occasion.

<ul style="list-style-type: none"> - Definition of a person in charge for each <i>gare routière</i> of supervision of installation and monitoring of the feature 	<ul style="list-style-type: none"> - Partner: Ministry of tourism 	<ul style="list-style-type: none"> - Support structure for implementation of the project at the level of each <i>gare routière</i>
<ul style="list-style-type: none"> - Definition of a person in charge for each bus company for supervision of installation, monitoring and update of the feature, transmission of data to the <i>gare(s) routière(s)</i> in the perimeter of the company + transmission to S3T 		<ul style="list-style-type: none"> - Support structure for the implementation of the project at the level of each bus company
<ul style="list-style-type: none"> - Installation - Commissioning - Operation - Maintenance 		<ul style="list-style-type: none"> - The project is ongoing (see the issue of maintenance in the description of the project here above)
<ul style="list-style-type: none"> - Regular meetings between users in order to exchange on best practices, improvements, etc. (<i>club d'utilisateurs</i>) 		<ul style="list-style-type: none"> - The system has to improve over the years and users have to know each other in order to facilitate exchanges, replacement of trained staff when necessary. - Good points and developments have to be shared.
Indicator		Risk
<ul style="list-style-type: none"> - The steering committee is created - Responsible persons are nominated for each <i>gare routière</i> and each bus company - Common specifications are defined - Materiel and software are purchased - The system is commissioned - The system is in use 		<ul style="list-style-type: none"> - No common grammar can be defined. The systems cannot be interconnected between the <i>gare routières</i> and the bus companies (this should be avoided since all these entities are under the supervision of the ministry of Transport). - The system does not perform for any reason (improper update, conformity of format of data, maintenance...).

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-7	Study of rail transport network for passengers/freight in South Tunisia	
Intervention Area	All South Tunisia	Implementing agency	Ministry of Transport / SNCFT

Description

It is necessary to undertake a strategic study dedicated to passenger and freight rail transport in South Tunisia³⁴. This study would include in its terms of reference:



Figure TR 3-7-1 Tunisia's rail network

- 1) The railway network in South Tunisia has been developed by the «*Compagnie des phosphates et des chemins de fer de Sfax-Gafsa* »³² mainly for mining and industrial purposes, in order to link the areas of production of phosphates in the governorate of Gafsa and the ports of export, Sfax then Gabès in a second stage;
- 2) This is the reason of the overall shape of this network, which was not designated at first place for passenger transport³³, and does not comprise any part south of Chott El Jerid/ south of Gabès.
- 3) SNTRI ensures by bus the continuity of rail transport south of Gabès. The passengers transfer from/to SNTRI with their train ticket constitutes a system of "combined tariff"
- 4) The network (equipment, facilities, vehicles and image) is aging and loses attractiveness towards existing and potential users, individuals or companies.
- 5) At the same time, the general quality of road transport (network, vehicles –cars, *louages*, and coaches) increases.

A – Points to be studied for passengers transport:

- complement/ synergy rail-road is already existing: around 500,000 passengers per year are transported by bus for part of their travel;
- comparison of transport times (when buses on 2x2 lane roads) and waiting times with the present network or improved network as per the proposal for project **TR 1-3** of high speed railway land;
- existing and potential clients:
 - for long distance transport (to Tunis, to Tripoli);
 - for regional transport (to Sfax, to Gabès, to Médenine);
 - for local transport (Tozeur-Metlaoui-Gafsa, El Hamma-Gabès, etc.);
- comparison of cost of construction/maintenance and of levels of service;
- use of the new planned high-speed line (see proposal for project **TR 1-3**) as backbone for regional passenger transport.

B – Points to be studied for the freight transport:

Phosphates represent 2/3 of the railway freight in Tunisia. The quantity transported decreased sharply, from 7 million

³² This company, now CPG, *Compagnie des phosphates de Gafsa* had the monopoly of the rail network South of Sfax. The rail network of South Tunisia has been transferred to SNCFT national railways in 1967.

³³ It takes approximately 10 hours at present to reach Tunis from Tozeur by train (450 km), and around 5 hours by car.

³⁴ Note: there is a pledge from France to finance the renovation of the railway Sfax-Gafsa-Gabès in order to improve the transport of phosphates and to unlock the regions from the inland (800,000 EUR of grant for studies, then works could be financed through a loan to SNCFT (43 Million EUR).

tons in 2010 to 3 million tons in 2013.

Transport is now undertaken for an important part by road, but for mining and phosphates industries train is considered as having a comparative advantage: one train can transport 1,700 tons of phosphates while a truck can transport only 30 to 32 tons (1 train = more than 50 trucks).

In the wake of the refurbishment of the rail network of the “*triangle des phosphates*”, the same study should be implemented for the freight transport by rail in South Tunisia.

The Terms of Reference (ToR) should comprise the study of the feasibility of the following items:

- 1) If possibilities for development of new mines of phosphate in Tozeur Governorate (to be confirmed), various possibilities for transport of minerals can be considered: train, trucks or “mineroduc”, a pipeline that transports a mix of minerals and water. Possibilities offered by rail transport should be duly considered at this occasion;
- 2) Rehabilitation for freight transport of the railway line linking Tozeur to Feriana and to Tunis;
- 3) Extension of rail tracks from Tozeur to the Algerian border;
- 4) Use of rail transport to remove phosphate refuse (phosphogypsum) from the port of Gabès to an inland storage site (location to be determined);
- 5) Access to the industrial port and facilities of Skhira;
- 6) Use of new high-speed line (see project **TR 1-3**) as a backbone for regional freight transport;
- 7) Development of multi-modal logistic facilities including rail transport;
- 8) Combined transport of goods and passengers.

As one can see the development of rail transport in South Tunisia will depend a lot from the use/specifications of the Trans Maghreb railway project.

Action Plan		
Actions	Relevant organizations	Role
- Creation of the steering committee and elaboration of the terms of reference of the study	- Ministry of Transport - SNCFT - S3T - Partners: Min. Industry (freight) Min. Tourism (passengers)	- The steering committee must define the terms of reference of the study in such a way that all themes be addressed without prior considerations on finalities and priorities
- Selection of the consultant		- The consultant must have a good knowledge of the area and of the specificities of rail transport.
- Implementation of the study		- At the time of implementation, S3T should be in a position to provide an important number of data and information following the census made beforehand (see project TR 3-3)
- Discussion of the results and elaboration of strategies		- This study has to lead to decisions in terms of priorities (geography, category) to define for rail transport. These priorities should foster complementarities between transport modes and promote sustainability.
Indicator		Risk
- The decision to undertake the study is taken - The consultant is selected - The study is realized - Recommendations and strategies are made based on the conclusions of the study - Some of these recommendation and strategies are proposed for implementation. - Some of them are selected and implemented		- The study is not comprehensive enough (counterparts, documents, information) and does not tackle adequately the various issues related to rail transport in South Tunisia. - None of the recommendations and strategies emitted at the conclusion of the study is implemented.

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-8	Traffic and parking master plans program (programme de plans de circulation et de stationnement)	
Intervention Area	All South Tunisia	Implementing agency	Cities + coordination S3T
Description			
<p>Apart from traffic, parking is a big issue in cities of South Tunisia which will become further more important in the coming years since the motorization rate should increase in parallel with the growth of GNP and GRP. Therefore, particular care has to be allocated to this issue in order to avoid that efforts made to reduce traffic bottlenecks in cities be reduced to almost nil by a drastic increase of congestion due to increase in number of cars and lack of parking places available.</p> <p>This effort must be coordinated at the level of the study area since various parking policies in various cities might be difficult to understand by users and citizens. The main point of this combined policy could be:</p> <ul style="list-style-type: none"> - priority to public transport vs. cars (creation of bus lanes when needed); - creation of bus + ride free parking sites in city outskirts (with public lightning, supervision); - same policy regarding tariffs, if pricing system is applied (limited duration of parking in hyper centre); - consideration for the 2-wheelers, the soft modes and the pedestrians; - consideration of accessibility for all, including in particular disabled people. <p>Some cities in the area have already realized studies in view of establishing a parking plan (<i>plan de stationnement</i>). A system of dialogue supervised by S3T (see proposal for project TR 3-2) will be made between the cities of South Tunisia in order to mutualise best practices and apply them to all cities of the area.</p>			
Action Plan			
Actions	Relevant organizations		Role
- Definition of a proposition of common platform to be used in order to set up the Terms of reference (ToR) for the studies	<ul style="list-style-type: none"> - Ministry of Equipment - Ministry of Transport - Ministry of Interior (traffic police) - S3T in coordination - Cities 		<ul style="list-style-type: none"> - At present cities are often setting <i>ex nihilo</i> the terms of reference for their studies. Therefore it may happen that some issues are not addressed or only partially addressed. - The point is to create a minimum basis/ "shopping list" where interested authorities can pick up in order to constitute their own ToR with a maximum of relevant items.
- Studies to be realized independently by each city with possible use of the propositions for ToR described above			<ul style="list-style-type: none"> - Each study realized its own study, pending on geographical considerations, existing roads, traffic characteristics, status of public transport, industry and commerce.
- Definition and implementation of policies by the cities			<ul style="list-style-type: none"> - In the same way, each city implements the policy which they have decided on these issues.
- Sharing of experience between cities of South Tunisia: problems, best practices, innovative solutions, etc.			<ul style="list-style-type: none"> - Creation and operation of a "group of users" under the coordination of S3T, in order to share experience and to disseminate best practices and ideas in the domain

<ul style="list-style-type: none"> - Creation of a permanent group on sustainable mobility in the cities of South Tunisia 		<ul style="list-style-type: none"> - The structure created around the issues of parking and car traffic is enlarged to tackle all aspects related to sustainable mobility in the cities of South Tunisia and this group meets on a regular basis.
Indicator	Risk	
<ul style="list-style-type: none"> - A first common “platform ToR” is established - This platform is used by several cities of South Tunisia for the ToR of their respective studies - The studies are implemented and corresponding policies decided. - The “Group of users” is created and meets on regular occasions - The “platform” increases in volume by addition of ideas and feedback of practices - A more important number of cities consider the platform as reference when elaborating the terms of reference for their studies - The “group of users” is transformed into a permanent structure of exchange on the issues of urban mobility in South Tunisia. 	<ul style="list-style-type: none"> - The “platform ToR” is not used as reference material - The group of users is not created - The group of users does not convene at regular basis - The structure “group of users” disappears and/ or is not transformed into a structure dedicated to tackle the challenges of sustainable mobility in South Tunisia. 	

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-9	Fund for road improvement outside cities	
Intervention Area	All South Tunisia (outside cities area)	Implementing agency	Min. Equipment
Description			
<p>Most of TR-2 projects refer to the enlargement of roads to 2x2 lanes. The point with this proposal is to have specific funding available for occasional and punctual operations like the creation of a roundabout, installation of advanced systems of road bumpers, installation of public lightning at a crossroad and at a pedestrian crossing, drainage and sidewalks on a section of road, etc.</p> <p>A specific fund may facilitate and speed up the process for request and allocation of funds. This fund can be financed by one or several ODA agency (ies), and should be managed by the ministry of Equipment, in charge of the general supervision of these items. The selection of projects should involve S3T.</p> <p>Note: a similar basket funding system is proposed for the cities (proposal for project TR 3-10), in this case with the cities as counterparts since they are managing road infrastructure inside their territory under supervision of the ministry of Interior.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Creation of the Fund and of its management structure	- Min. Equipment - Min. Finances - Partner organizations (funding) - S3T (follow up of projects)	<ul style="list-style-type: none"> - The Fund has to be officially created and duly registered to all relevant authorities. It should be exempted of taxes and levies - Governance of the Fund by ministry of Finance (financial planning and supervision) and min. of Equipment (technical relevance and definition of priorities in implementation of proposed projects). - Yearly reporting to be made. - Auditing through S3T possible. 	
- Mobilization of financing		<ul style="list-style-type: none"> - By the State (if no adequate budgetary tool under the State budget), in addition by ODA agencies, by other partners. - "Trust funds" possible? (external funding partner for financing works to be undertaken in a dedicated place, e.g. improvement of access to a factory) 	
- Definition of a template request and of a procedure of individual assessment (<i>système de prise en consideration</i>)		<ul style="list-style-type: none"> - Layout and presentation of the requests to be harmonized, standard processing, pre-determined decision criteria in order to avoid complaints. 	
- Decision on funding the projects		<ul style="list-style-type: none"> - Decision is taken by the designated responsible / responsible structure inside the min. Equipment. 	
- Studies, tendering		<ul style="list-style-type: none"> - Made by DRE + specific consultants if needed. 	
- Supervising the works		<ul style="list-style-type: none"> - Made by DRE (or specific consultant if specific feature). Double-check with ONSR if no problem of road safety before commissioning. 	
- Commissioning		<ul style="list-style-type: none"> - By min. Equipment 	
- Include the new structure into the general maintenance scheme		<ul style="list-style-type: none"> - To be done by min. Equipment. 	
Indicator		Risk	
<ul style="list-style-type: none"> - The Fund is created - The Fund has funding - The projects are selected and implemented 		<ul style="list-style-type: none"> - No money in the Fund - The process too complicated or at the contrary too lenient regarding the allocation of funds (funding agencies complain and do not pursue the participation). 	

Strategy	TR-3	Increase the sustainability of mobility	
Project	TR 3-10	Fund for street improvement in cities (sidewalks, lightning, drainage, roundabouts, speed reducing devices...)	
Intervention Area	All South Tunisia	Implementing agency	Min. Interior
Description			
<p>This project is similar in its purpose to project TR 3-9 for improvements of roads outside cities, but differs in its institutional structure since the streets of cities depend from the city under the supervision and responsibility of the ministry of internal affairs (<i>ministère de l'intérieur</i>).</p> <p>The purpose is to create a basket funding in order to facilitate and speed up the undertaking of operations of improvement of mobility of a limited financial scale inside city areas in South Tunisia. In case of common financing with the own budget of the cities, this Fund could serve as an incentive to start the operations.</p> <p>Among the improvements which could be considered under this fund:</p> <ul style="list-style-type: none"> - paved sidewalks for safety of pedestrians (minimum width 90 cm for wheelchairs), and; - drainage to be realized at the same time than the sidewalks (cost saving, technical requirement); - public lightning, especially at intersections and at pedestrian crossings (<i>passages protégés pour piétons</i>); - grids and similar equipment to prevent accumulation of sand on slopes; - speed reducing devices (speed cushions); - roundabouts (with reduced diameters for reducing speed at intersections inside the cities),... <p>Note: operations of maintenance are not included in the possibilities of financing under this Fund. They must be planned and implemented <u>by the beneficiaries</u>. Corresponding commitment should be one of the criteria for the selection of the projects to fund.</p>			
Action Plan			
Actions	Relevant organizations		Role
- Creation of the Fund and of its management structure	<ul style="list-style-type: none"> - Min. Interior - Min. Finances - Technical partner: - Min. Equipment - Partner organizations and entities (funding) - S3T (follow up of projects) 		<ul style="list-style-type: none"> - The Fund has to be officially created and duly registered to all relevant authorities. It should be exempted of taxes and levies - Governance of the Fund by the ministry of Finance (for the financial planning and supervision) and by the min. of Interior (in charge of streets inside cities, for the definition of priorities in implementation between proposed projects) + Min. Equipment (technical relevance of projects). - Yearly reporting to be made. - Auditing through S3T possible.
- Mobilization of financing			<ul style="list-style-type: none"> - By the State (if no adequate budgetary tool under the State budget), in addition by ODA agencies and/or by other partners. - "Trust funds" possible? (external funding partner for financing works to be undertaken in a dedicated place, e.g. improvement of access to a factory)
- Definition of a template request and of a procedure of individual assessment (<i>système de prise en considération</i>)			<ul style="list-style-type: none"> - Layout and presentation of the requests to be harmonized, standard processing, pre-determined decision criteria in order to avoid complaints.

- Decision on funding the projects		- Decision is taken by the designated responsible / responsible structure inside the min. Interior.
- Studies - Tendering		- Made by the cities + specific consultants support of DREs if needed.
- Supervising the works		- Made by cities' authorities and with the support of DREs or specific consultant if needed. Road safety inspection with ONSR and traffic police of the city before opening.
- Commissioning		- By the city, in presence of representatives of min. Interior and min. Equipment
- Include in maintenance		- To be formally acted and financed by the city
Indicator		Risk
<ul style="list-style-type: none"> - The Fund is created - The Fund has funding - The projects are selected and implemented 		<ul style="list-style-type: none"> - No money in the Fund - The process too complicated or at the contrary too lenient regarding the allocation of funds (funding agencies complain and do not pursue the participation).

Sector	Strategy	TR-4	Increase the safety/eco-friendliness of mobility		
	Plan		Actions	Term	Cost
Infra	a) Institutional and human capacity development plan	TR 4-1: Detailed investigations for lethal road accidents in South Tunisia	<ul style="list-style-type: none"> - Creation of a steering committee under the supervision of ONSR - Recruitment of inspectors on a voluntary basis (<i>volontariat</i>) - Training of the inspectors - Creation of a warning system - Request and decision to dispatch an expert - Onsite interviews (traffic police, <i>garde nationale</i>, eyewitnesses...) - Interviews with family and colleagues - Reporting - Debriefing - Proposals for remediation/ suppression of black spot, if the case - Decision on works and accompanying measures by the authorities in charge - Reporting by S3T 	Short	n.a.
	b) Facility and infrastructure development plan	TR 4-2: Continuous improvement of tourist roads	<ul style="list-style-type: none"> - Creation of a steering committee under the responsibility of the ministry of Tourism - Consideration of the items which can benefit from funding under this project, with a priority to road quality, road safety and road environment aspects - Definition of a process to select the projects to be financed and implemented. Definition of the levels of priorities - Information on the system - Reception of candidate projects - Selections of projects on a periodical basis - Implementation of the works - Road safety inspection and commissioning - Definition and implementation of a scheme of maintenance 	Short	n.a.



		<p>TR 4-3: Refurbishment of the inter-urban bus stations (<i>gares routières</i>) in the six governorates</p>	<ul style="list-style-type: none"> - Creation of a steering committee for each <i>gare routière</i> under the supervision of A3T - Definition of a program the for improvement of the infrastructure: - Technical studies by an architect or specialized consultant, in house or externalized - Tendering - Supervision of the works with due care on provisional facilities and signaling during the work period (indication of schedules and departure platforms, etc.) - Commissioning of the new/improved infrastructure - Establishment of convention(s) for sustainable operation and maintenance of the various parts of the new facilities (cleaning, lightning, etc.) 	Short	n.a.
		<p>TR 4-4: Program for the refurbishment/ development of SNCFT stations</p>	<ul style="list-style-type: none"> - Creation of an ad hoc committee for each train station under the supervision of SNCFT and the city - Definition of a program for the improvement of the infrastructure: - Technical studies by an architect or specialized consultant, in house (SNCFT) or externalized - Tendering - Supervision of the works with due care on provisional facilities and signaling during the work period - Commissioning of the new/improved infrastructure - Establishment of convention(s) for sustainable operation and maintenance of the various parts of the new facilities 	Short	n.a.
	c) Financial and investment plan	<p>TR 4-5: Special Fund to finance projects and activities related to road safety</p>	<ul style="list-style-type: none"> - Creation of the Fund - Authorization for allocation of the penalties and fines (<i>les amendes</i>) to the Fund - Creation of a steering committee under supervision of ONSR - Definition of the priorities to be considered in South Tunisia - Establishment of a program of intervention (yearly) - Realization of operations - Reporting - Closure of the Fund when only few individual operations to handle 	Short	Fund

Strategy	TR-4	Increase the safety/eco-friendliness of mobility	
Project	TR 4-1	Detailed investigations for lethal road accidents in South Tunisia	
Intervention Area	All South Tunisia	Implementing agency	Supervision by ONSR
Description			
<p>Strategic theme 4 for the transport sector is “Consideration of the traffic safety and environment”. This proposal is an overarching background action to understand, to decide and to implement. Basically, it can be implemented by anyone who has lost a friend or a relative in a car accident. At present, a national plan for road safety is under elaboration at the national office for roads safety (ONSR) under AfDB financing. This proposal aims to support the national level due to the specific severity of the situation in South Tunisia (more casualties in car accidents compared to the general level in Tunisia), by implementing a detailed investigation for each lethal road accident (1 week of work). One inspector by governorate should be dedicated to this issue (staff having undergone a proper training for technical and psychological issues – this point of preparatory training is compulsory). The conclusions of reports of inspectors (points related to transport or infrastructure) should be synthesized by S3T and presented to each meeting of stakeholders (see proposal for project TR 3-2), in view of implementation of works if necessary. The funding of this project (marginal cost – <i>coût marginal</i> - if the experts recruited for this project are part-time seconded from ministries or local authorities) can be done through the funding made available by the enforcement of regulations (see proposal for project TR 4-5).</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Creation of a steering committee under the supervision of ONSR	- Min. Interior - ONSR - Min. Equipment	- The steering committee with impulse the project, gather reports and keep records on expert reports and on improvements	
- Recruiting inspectors on a voluntary basis (<i>volontariat</i>)	- Min. Transport - (Inspectors specialized in transport infrastructure issues)	- Inspectors must have good previous onsite knowledge on technical issues regarding road network, cars and drivers psychology	
- Train the inspectors	- Min. Santé - Other ministries - External support can be sought (Global Road Safety Partnership GRSP, IRF?) - S3T for reporting	- The expert reports are difficult to make since having to be realized in a short period of time and to comprise interviews with the families and colleagues of the victim in order to have better understanding of the causes of road accident in a broader meaning. - Therefore experts/ inspectors must receive proper training (by ONSR) on how to gather proper information in such circumstances.	
- Setting-up of a warning system		- ONSR or local representative, based on information from traffic police or <i>garde nationale</i>	
- Request and decision to dispatch an expert		- Based on information on location and condition of the lethal accident, ONSR or representative of the steering authority makes a request to dispatch one specific expert, pending on availability and acceptance (1 week for the process, 1 week for the report).	
- Onsite interviews (police, <i>garde nationale</i> , eyewitnesses)		- The expert goes to the accident site and interviews authorities involved in the	


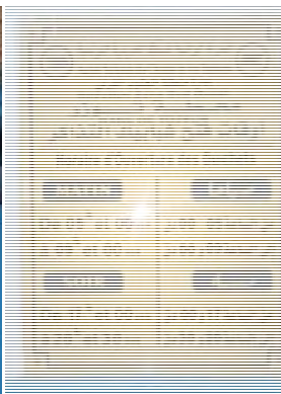
		follow up of the lethal accident (traffic police, <i>garde nationale</i> , health services if relevant) and also eyewitnesses, in order to have a clear description and understanding of the onsite circumstances.
- Interviews with family and colleagues		- These interviews have to be realized with persons who knew the victim well, to obtain elements which may help to better understand the case from a technical point of view (multiple factors accident).
- Reporting		- The expert drafts her/his report in a period which does not exceed 2 weeks after the last meeting. - The time for drafting the report is included in the duration of the expertise.
- Debriefing		- The report is transmitted for analysis by ONSR. - A debriefing with the expert takes place within a period of 3 months following the remittance of the report.
- Proposals for suppression/ remediation of black spot, if the case		- Based on the conclusions of the report, studies are undertaken under the responsibility of min. Equipment (outside of cities) and min. of Interior (inside of cities), to tackle the aspects linked to infrastructure which may have had an influence in the process of the accident (<i>facteurs accidentogènes</i>).
- Decision on works and accompanying measures by the authorities in charge		- Based on these studies, authorities in charge (State, cities, etc.) take a decision on realization of remediation/safety works. - The works can be financed through the Fund defined in proposal for project TR 4.5 here after (Note: AfDB preliminary study on road safety in Tunisia recommends that for new infrastructure, 10% of the amount of the works be dedicated to roads safety measures and equipment).
- Reporting by S3T		- S3T reports on road safety issues (problems, measures, achievements) during a dedicated point of the agenda of the regular meetings of the stakeholders.
	Indicator	Risk
	- The steering structure is created - Volunteers can be found in the six governorates - Expertise are undertaken - Expert reports lead to studies and measures for black point remediation - The structure has to be dismantled thanks to no more lethal accident ("zero casualty option", <i>option zéro mort dans les accidents de la circulation</i>)	- The structure is not created. - Experts cannot be found (not enough level of expertise) nor have not enough time (2 weeks minimum) to undertake their expert mission in suitable conditions. - Works recommended in conclusion of the report cannot be implemented.

Strategy	TR-4	Increase the safety/eco-friendliness of mobility	
Project	TR 4-2	Continuous improvement of tourist roads	
Intervention Area	All tourist roads in South Tunisia	Implementing agency	Min. of Tourism/ Min. Equipment
Description			
<p>Tourist roads have specific needs in terms of (i) creation and maintenance of large size parking areas off-carriageways, with stopping places for large size coaches and mobile homes, shops, information area, lavatories and other facilities and (ii) particular care for environment issues along the road (including advertisement boards, signaling and cleaning on a regular basis of waste and plastic bags brought by the wind). The main point here is to attract and retain tourists thanks to increased environmental quality and an upper level of service.</p> <p>In addition, when possible, these “green roads” should constitute loops (<i>circuits touristiques</i>) in order to avoid necessity of turn round. In the case of “green dirt roads” (<i>itinéraires touristiques non revêtus</i>), particular care must be allocated to maintenance and include on-site patrols on regular basis (weekly as a minimum) to ensure that a proper road and environmental condition is maintained.</p> <p>The main public entities in charge are the ministry of Equipment, ONSR (road safety), the ministry of Environment and the ministry of Tourism. S3T should be associated to decisions and reporting made in the scheme of the <i>Mission Transport</i>, see project TR 3-2. Case by case support should be provided by local authorities: governorates, delegations and cities (financial support, workforce support, counseling...) and by the persons involved in tourist related industries (hotels, <i>gîtes</i>, restaurants, shops) in the scheme of a community based tourism (CBT).</p> <p>Road safety issues will be considered in the scheme of the selection of the projects and onsite inspections will be carried out prior commissioning.</p> <p>Since the quantity and amount of works to be implemented is smaller both in terms of number of routes or of kilometers to be considered for improvement, it possible to think of a system with one single source of funding (State budget or dedicated fund) as to a basket funding system or partial financing mixed with other sources.</p>			
Action Plan			
Actions	Relevant organizations	Role	
– Creation of a steering committee under the responsibility of the ministry of Tourism	– Ministry of Tourism – Ministry of Environment – Ministry of Equipment – ONSR – S3T – Governorates – Delegations	– Define the “touristic roads” to be considered under this project (decision at the level of the ministry if the definition has to be the same in whole Tunisia, otherwise a locally created and duly endorsed tourism promotion entity can be in charge).	
– Consideration of the items which can benefit from funding under this project with a priority to road quality, road safety and road environment aspects	– Cities – Entities involved in tourism industry (Community Based Tourism)	– It is important to define on a general basis what can/ cannot be funded under this program, and to which level (maximum unit amount, maximum percentage of works to be funded, other possibilities of financing...). In particular, proper signaling (<i>signalisation routière dédiée</i>) of the touristic sites in South Tunisia must be considered in an adequate number and in adequate locations (specific road panels/ <i>panneaux routiers spécifiques</i>).	
– Definition of a process to select projects to be financed and implemented. Definition of the levels of priorities		– It is important that all projects to be selected be presented on the same format and content similar compulsory information (e.g. consideration for the environment) in order to facilitate understanding of the projects and decision regarding possible financing. Also, it will facilitate the work of selection if general	


		criteria are defined ex ante regarding priorities (criteria to be decided and implemented by the steering committee).
- Information on the system		- This system has to be well known by a quantity of entities and concerns projects which can be of limited size (e.g. improvement of a parking area (<i>aménagement d'une aire de stationnement</i>) with a reduced number of parties involved at community level. Appropriate diffusion of information is therefore required.
- Reception of candidate projects		- The steering committee must define a process for selection and an entry point for the candidate projects (S3T can be this entry point for South Tunisia)
- Selections of projects on a periodical basis		- Project have to be selected on a multi-criteria basis tourism/equipment/ road safety/ environment/ leverage effect on the local economy by an ad hoc structure to be constitute. The structure will meet on regular basis to compare and select among proposed projects.
- Implementation of the works		- Under the supervision of min. Equipment outside cities, under supervision of the cities in cities areas (+ support of a specialized consultant if necessary).
- Road safety inspection and commissioning		- The improvements are open to general public and to tourists after confirmation that there may be no problem related to road safety created by the new equipment.
- Definition and implementation of a scheme of maintenance		- At the time of the commissioning of project, the beneficiaries must have defined a sustainable scheme for the maintenance of the infrastructure/ equipment created. This point of maintenance should be one of the criteria considered for the selection of the projects.
	Indicator	Risk
	<ul style="list-style-type: none"> - The funding system is defined and the funds are available - The steering committee is created - The criteria of eligibility of projects and the priorities are defined - The committee of selection of the projects is defined and meets - The projects are selected and implemented - More tourists and more tourist activity in South Tunisia 	<ul style="list-style-type: none"> - No funding available or insufficient funding - No clear criteria and priorities for the selection of projects - No proper commissioning - No maintenance of the infrastructure/ equipment created.

Strategy	TR-4	Increase the safety/eco-friendliness of mobility	
Project	TR 4-3	Refurbishment of the inter-urban bus stations (<i>gares routières</i>) in the six governorates	
Intervention Area	All <i>gares routières</i> in South Tunisia	Implementing agency	A3T, in liaison with the <i>autorité organisatrice des transports (AOT)</i> on a case by case basis
Description			
<p>In South Tunisia, the <i>gares routières</i> (inter-city bus stations) are under the supervision of A3T (<i>agence technique des transports terrestres</i>). The <i>gares routières</i> are buildings of good quality and layout (Kébili for instance) but refurbishment is sometimes necessary (e.g. glass canopy in Tozeur).</p> <p>A particular case is the <i>gare routière</i> of Gabès, located in the city centre (see picture), it is very not much convenient any more: only 3 lanes for buses in the main part, nearby parking for <i>louages</i> always packed with cars, heavy traffic jams in the vicinity. Hence, there is a project to relocate this <i>gare routière</i> in the outskirts of the city to a more modern and functional facility. This would imply the modification of several suburban and interurban bus routes, as a good servicing by urban buses for the connection with the urban area (see project for métro inside Gabès project TR 1-6).</p> <p>The refurbishment of the <i>gares routières</i> will have significant quality impact. Information to existing and potential passengers of interurban public transport shall be improved in parallel (see proposal for project TR 3-6 on ITS in this area), and this will have positive impact on the clientele.</p>			
			
Fig TR 4-3-1 <i>Gare routière</i> in Gabès (Stands for buses)		Fig TR 4-3-2 <i>Gare routière</i> in Tozeur (Lobby)	
Action Plan			
Actions	Relevant organizations		Role
<ul style="list-style-type: none"> - Creation of a steering committee for each <i>gare routière</i> under the supervision of ATTT - Definition of a program for the improvement of the infrastructure: 	<ul style="list-style-type: none"> - A3T (ATTT) - Ministry of Transport/ DRT - Ministry of Tourism - in cooperation with: <ul style="list-style-type: none"> - <i>Autorité organisatrice des transports (AOT)</i> if existing at the place of the <i>gare routière</i> to be refurbished - Bus companies utilizing the infrastructure - City - Passengers (by survey) - S3T for information 		<ul style="list-style-type: none"> - Management of the project and coordination of the stakeholders - Definition and validation by the stakeholders (including the users by survey or questionnaire) of what has to be renewed/ improved: structure, information and ITS equipment, administrative office(s) and facilities for staff and drivers, public parts, shops, parking areas, surroundings (liaison with the city center, with the area(s) for <i>louages</i>, pedestrian crossings, lightning, etc.)

<ul style="list-style-type: none"> - Technical studies by an architect or specialized consultant, in house or externalized 		<ul style="list-style-type: none"> - Studies to be realized, with special care due to the specificity of <i>gares routières</i>: facilities accommodating customers (<i>établissement recevant du public</i>), turning radius for buses (<i>rayons de giration des bus</i>), etc.
<ul style="list-style-type: none"> - Tendering 		<ul style="list-style-type: none"> - Selection of a company/ group of companies to perform the works
<ul style="list-style-type: none"> - Supervision of the works with due care on provisional facilities and signaling during the work period (indication of bus schedules and departure platforms, etc.) 		<ul style="list-style-type: none"> - The <i>gare routière</i> has to be used during the work period by an important number of customers. It is therefore important to consider this point and to ensure the continuity of servicing during the work period in order to retain all customers. Information on the future layout of the building may be of use in this issue.
<ul style="list-style-type: none"> - Commissioning of the new/improved infrastructure 		<ul style="list-style-type: none"> - Official ceremony (<i>inauguration</i>) with representatives of the ministry of Transport, A3T, the city and bus companies (+ representative of ministry of Tourism): the <i>gare routière</i> is an important public building which participates to the development and the promotion of the city.
<ul style="list-style-type: none"> - Establishment of convention(s) for sustainable operation and maintenance of the various parts of the new facilities (cleaning, lightning, etc.) 		<ul style="list-style-type: none"> - Convention and contracts have to be established between A3T and all categories of users (+ each city for the surroundings) regarding proper operation and maintenance of the facility: who does what? <i>Qui fait quoi?</i>
Indicator		Risk
<ul style="list-style-type: none"> - The steering committee is created - The program is elaborated - The refurbished facility is commissioned 		<ul style="list-style-type: none"> - No participation of all stakeholders in the preparation of the program - Poor performance of the works - Poor or non-sustainable maintenance of the refurbished facility, its surroundings and its servicing

Strategy	TR-4	Increase the safety/eco-friendliness of mobility	
Project	TR 4-4	Program for refurbishment/ development of the SNCFT stations	
Intervention Area	All train stations in South Tunisia (3 governorates)	Implementing agency	SNCFT
Description			
<p>Appropriate care must be given to railway facilities, which comprise stations in addition to railways, trains and wagons.</p> <p>A comprehensive program for revamping/refurbishment should be launched for all train stations, in addition to the station of Gabès which needs to be moved, with the old station possibly transformed into a main station of the new “métro” (to be confirmed pending on the localization of the line see proposal for projects TR 1-3, TR 1-4 and TR 1-6).</p> <p>As a whole, SNCFT should be more “visible” with offices to sell train tickets located in the stations but also inside city centres with extended opening hours, and providing information on schedules, tariffs, transport possibilities (SNCFT and other transport), claim management desk, etc.</p>			
			
<p>Figure TR 4-4-1 Train station in Tozeur (early XXth century)</p>		<p>Figure TR 4-4-2 Opening hours based on trains' arrivals schedule</p>	
Action Plan			
Actions	Relevant organizations	Role	
– Creation of an ad hoc committee for each train station under the supervision of SNCFT and the city	– SNCFT – Ministry of Transport/ DRT – Ministry of Tourism – in cooperation with:	– Management of the project and coordination of the stakeholders (mainly SNCFT and the city)	
– Definition of a program for improvement of the infrastructure:	– <i>Autorité organisatrice des transports</i> (AOT) if existing at the place of the train station to be refurbished (connection with city bus network and interurban buses). – City – S3T for information	– Definition and validation of what has to be renewed/ improved: structure, information and ITS equipment, administrative office, facilities, public parts, shops, parking areas, surroundings: liaison with city center, with the area for buses and <i>louages</i> , pedestrian crossings, lightning, etc.	
– Technical studies by an architect or specialized consultant, in house (SNCFT) or externalized		– Studies to be realized, with special care due to specificity of the train station, facility accommodating customers	

		(<i>établissement recevant du public</i>) including disabled passengers
- Tendering		- Selection of a company/ group of companies to perform the works
- Supervision of the works with due care on provisional facilities and signaling during the work period (indication of schedules and departure platforms, etc.)		- The train station has to be used during the period of the works by an important number of customers. It is important to consider this point and to ensure the continuity of the servicing in order to retain the customers. Information on the future layout of the building may be of use in this issue.
- Commissioning of the new/improved infrastructure		- Official ceremony (<i>inauguration</i>) with representatives of the ministry of Transport, the city + representative of ministry of Tourism: the train station is an important public building which participates to the development and the promotion of the city
- Establishment of convention(s) for sustainable operation and maintenance of the various parts of the new facilities (cleaning, lightning, etc.)		- A convention has to be established between SNCFT and the city regarding operation and maintenance of the train station, the parking area and the surroundings: who does what? <i>Qui fait quoi?</i>
Indicator		Risk
<ul style="list-style-type: none"> - The program is elaborated - The refurbished facility is commissioned - More customers in the improved facility 		<ul style="list-style-type: none"> - Poor performance of the works - Poor or non-sustainable maintenance of the refurbished facility, its surroundings and its servicing - No positive influence on the number of customer

Strategy	TR-4	Increase the safety/eco-friendliness of mobility	
Project	TR 4-5	Special Fund to finance projects and activities related to road safety	
Intervention Area	All South Tunisia	Implementing agency	ONSR, Min. Equipment, and Min. Transport pending on project considered
Description			
<p>It is proposed that the fees collected thanks to the enforcement of traffic regulations (see proposal for project TR 5-1) be put in a Special Fund dedicated to finance road safety activities and projects in South Tunisia (and if relevant for Tunisia as a whole), for the following reasons:</p> <p>According to the statistics from the ministry of Interior and INS, road accidents killed 209 persons in the six governorates of South Tunisia in 2010;</p> <p>This represents 17.3% of the total of lethal accidents in Tunisia in 2010, for a population accounting for only 14.7% of the population of the country the same year;</p> <p>This shows that South Tunisia is an area of the Tunisian territory (i) more prone to road accidents (ii) where the accidents have an increased degree of severity.</p> <p>Pedestrians represented an average of 28% of the casualties in Tunisia due to road accidents in 2010 (source WHO world report on road safety).</p> <p>Places implying risks due to mixed traffic (road crossings, entrances of schools and other public buildings...) must be secured and sidewalks installed.</p>			
			
<p>Figure 4-5-1 Olive groves by early morning</p>			
<p>Note: in its preliminary study on road safety in Tunisia, AfDB indicated that 10% of the construction costs should be dedicated to facilities related to road safety. Up to now and like in many countries this has not been the case, hence a specific need and effort to be made on this issue.</p>			
Action Plan			
Actions	Relevant organizations		Role
- Creation of the Fund	<ul style="list-style-type: none"> - ONSR - Min. Equipment 		- The Fund has to be officially created.
- Authorization for allocation of the penalties and fines (<i>les amendes</i>) to the Fund	<ul style="list-style-type: none"> - Min. Transport - Min. Interior - <i>Garde Nationale</i> - Min. Health - Min. of Education - Governorates - Delegations 		- At present, fines related to the enforcement of road safety (to be improved see proposal for project TR 5-1) go to the general budget. Authorization has to be obtained by Min. Finance for allocation of these resources to the Fund.

<ul style="list-style-type: none"> - Creation of a steering committee under supervision of ONSR 	<ul style="list-style-type: none"> - Cities - Bus companies - <i>Louages</i>, truck drivers and road professionals (<i>les professionnels de la route</i>) - NGOs in the domain - S3T 	<ul style="list-style-type: none"> - The Fund must be managed in such a way that all operations be directly linked to road safety improvement (other possibilities for financing exist, either funds (inside and outside cities TR 3-9 and TR 3-10), or specific projects (e.g. TR 4-2 improvement of tourist roads).
<ul style="list-style-type: none"> - Definition of the priorities to be considered in South Tunisia 		<ul style="list-style-type: none"> - Priorities must be defined: mitigation of black spots, improvement of signaling, lightning, speed reduction devices, speedometers, etc.
<ul style="list-style-type: none"> - Establishment of a program for intervention (yearly) 		<ul style="list-style-type: none"> - All operations must be planned and organized only a few operations should be taken into consideration case by case (specific issue not previously considered)
<ul style="list-style-type: none"> - Implementation of operations 		<ul style="list-style-type: none"> - By the ministry in charge
<ul style="list-style-type: none"> - Reporting 		<ul style="list-style-type: none"> - Through S3T at a point of the agenda during its stakeholders meeting.
<ul style="list-style-type: none"> - Closure of the Fund when only few individual operations to handle 		<ul style="list-style-type: none"> - This is the proof of the success of the funds: operations realized and equipment purchased has permitted to significantly reduce road accidents and casualties. The remaining problems can be tackled through general budget of ministries.
Indicator		Risk
<ul style="list-style-type: none"> - The Fund is created - The Fund is funded - The priority program is prepared - Projects are implemented - The number of accidents and casualties decrease - The Fund is closed 		<ul style="list-style-type: none"> - No possibility to fund the Fund as foreseen (in this case external financing to be sought or only a function of counseling allocated to the structure created to manage the Fund) - No clear allocation of projects to road safety related issues - No reduction of road accidents and casualties in South Tunisia.



Sector	Strategy	TR-5	Support The Production Sector		
	Plan		Actions	Term	Cost
Infra	a) Institutional and human capacity development plan	TR 5-1: Enforcement of the regulations in the transport sector (all modes)	<ul style="list-style-type: none"> - Purchase the necessary equipment - Train the staff - Process the controls - Receive payment of fines when irregularities 	Short	n. a.
	b) Facility and infrastructure development plan	TR 5-2: Improving the facilities of the public transport companies	<ul style="list-style-type: none"> - Define a plan for equipment and priorities (each company) - Make a request for funding - Implement corresponding works - Define a plan for maintenance 	Short	n. a.
		TR 5-3: Renewing <i>louage</i> vehicles	<ul style="list-style-type: none"> - Creation of a financial facility supporting the purchase of new vehicles dedicated to public transport - Funding of the facility and definition of the conditions to benefit - The facility is operative under its conditions (minimum age of vehicles concerned, duration of the program, etc.) 	Short	n. a.
		TR 5-4: Development of the Gabès port	<ul style="list-style-type: none"> - Depollution of the harbor - Better servicing of nearby industry - Creation of a facility to handle containers 	Short	n. a.
		TR 5-5: Development of the Zarzis port	<ul style="list-style-type: none"> - Create an ad hoc entity in charge of the development of the area - Creation of necessary rail and road infrastructure, of train and bus services to connect with Zarzis (staff) - Development of the port area with a section dedicated to the handling of gypsum, and another section dedicated to the handling of general freight, in particular containers. - Creation of an areas dedicated to the storage and handling of containers inside the port area. - Creation of a scheduled line of maritime transport with at least one international destination - Creation of a berth dedicated to cruises. 	Short	n. a.
		TR 5-6: Development of freight transport by plane in South Tunisia	<ul style="list-style-type: none"> - Census of freight transport in South Tunisia and in Tunisia - Survey to companies about the need of such transport and their willingness to pay pending on tariffs - Looking for a company suitable to implement such transport - Implementation of a test under a period of 1 year 	Short	n. a.

		<p>TR 5-7: Program for the development of logistics centres</p>	<ul style="list-style-type: none"> - Census of planned logistic zones and their characteristics - Definition of geographical priorities pending on industrial activity in the area. - Purchase of corresponding surfaces - Allotment and networks (<i>allotissement de la surface, voirie et réseaux divers</i>) - Find a structure in charge of the exploitation - Sell or rent spaces to companies - Operational phase 	Short - Mid	n. a.
		<p>TR 5-8: Opening of additional border posts and improvement of existing ones</p>	<ul style="list-style-type: none"> - Definition of which border posts may be opened in the future and the corresponding horizon - Preparation of corresponding infrastructure (mainly roads) - Commissioning of the infrastructure prior the opening of the border post 	n. a.	n. a.
		<p>TR 5-9: Elaboration of structured development scenarios for the Djerba Island</p>	<ul style="list-style-type: none"> - Same ToR than those of this study on the 6 governorates, with a focus on transport and on the Djerba island 	n. a.	n. a.
		<p>TR 5-10: Structured development scenarios for infrastructure in Kébili governorate</p>	<ul style="list-style-type: none"> - Buy buses, authorize transport - Create the project structure - Assess the Chott link - Reinforce the structure of the link and make it flood proof - Develop the link - Create a rail track on the Chott link and to Kebili and Tozeur - Create the stations - Commission the train (2 cars) - Operate and maintain the train and the stations 	n. a.	n. a.
	c) Financial and investment plan	—	—	—	—

Strategy	TR-5	Support The Production Sector	
Project	TR 5-1	Systemization of enforcement of regulations in the transport sector (all modes)	
Intervention Area	All South Tunisia	Implementing agency	Ministries of Equipment, Transport, police, <i>garde nationale</i>
Description			
<p>Among the issues to be addressed for the establishment of conditions permitting sustainable development of the transport sector in South Tunisia while supporting the economy of the domain, is the systemization of the enforcement of related regulations in order to suppress distortions resulting in lower proposed prices due to unmaintained, overloaded vehicles and poor overall quality, which may also result in road accidents due to machine failure.</p> <p>The present project aims to tackle the issue by providing to authorities in charge means to perform appropriate verifications and to systemize (<i>systématiser</i>) the controls in order to suppress a possible “random” aspect and the feeling that penalties can be easily avoided.</p> <p>Among important issues are (i) the enforcement of the regulation related to maximum admissible axle load (now 13 tons/axle), to be controlled with appropriate materials in sufficient quantity, at the source (ports, borders posts, factories, logistics centers, industrial areas...) and on the roads, (ii) reduction of emission of pollutants and (iii) enforcement of speed limits, in particular in urban areas³⁵. In fact:</p> <ol style="list-style-type: none"> 1) Overloaded vehicles have a negative impact on the quality of the road surface. In addition, they are often slower than the general traffic and hence penalize other users of the road. 2) Vehicles with poor maintenance often show leaks of oil, which result in further negative influence on the pavement and in risk for general circulation due to the presence of oil on pavement (hydroplaning due to oil). In addition, air pollution is important and may cause health problems; 3) Respect of speed limits basically aims to reduce the number and severity of road accidents. In addition to the casualties, focus should be made on the people who will suffer permanent handicap after an accident, the correlative negative impact on the income on the family and basically the fact that an accident, even without injuries, results in costs for repair and no availability of a vehicle for other purposes. <p>Systematic enforcement of regulations in the domain, beyond direct effect on road safety, may have a positive impact on employment in the sector and on the automotive industry in general (need of adequate facilities and skilled staff for a better level of maintenance, see policy on technical inspection (<i>contrôle technique</i>) implemented by A3T), on traffic facilitation (less traffic jams due to slow overloaded vehicles) and on quality of road pavement due to reduced aggressiveness of axle loads, hence induced budgetary savings in road maintenance.</p> <p>If enough related activity induced, this can allow the creation in one city of South Tunisia of <u>a Training Centre for Technicians in the automotive sector</u> in order to complement the onsite job-training system (<i>compagnonage</i>).</p> <p><u>Note 1:</u> This project must be implemented and managed by a dedicated body in cooperation with the Traffic Police, the National Guard (safety and security during controls on the road in and outside cities) and with the ministry of Finance (collection of fees and fines, which should be transferred to the special fund on road safety see proposal for project TR 4-5).</p> <p><u>Note 2:</u> This project comprises the purchase of materials (speed meters, axle loads meters...) which can be implemented through specific ODA operations (loans or grants from ODA partners) or permitted by the above Fund (see proposal TR 4-5).</p>			

³⁵ Especially cities and villages crossed by large infrastructure. This action can be combined with other projects for equipment in speed reducing features (see proposals for projects **TR 3-10** and **TR 4-5**).

Action Plan		
Actions	Relevant organizations	Role
- Purchase the necessary equipment	<ul style="list-style-type: none"> - Min. Interior - <i>Garde nationale</i> - ONSR - Min. Equipment - Min. Transports - S3T Follow up 	- At present only a few devices are available. Purchase of devices in a sufficient quantity is a prerequisite for proper implementation.
- Train the staff		- There also the staff must be trained in order to perform the control as fast as possible with a perfect quality. Teams must be formed between controllers and supporting team (road police).
- Process the controls		- This is the purpose of the proposal
- Receive payment of fines when irregularities		- Here also is the issue, since fines must feed the Fund to purchase additional equipment and realize remedy works.
Indicator		Risk
<ul style="list-style-type: none"> - The material is purchased - The teams are formed and trained - The controls are undertaken 		<ul style="list-style-type: none"> - Insufficient material (quantity, quality). - Insufficient number of control, therefore still the "at random control" feeling - No recovery of funds

Strategy	TR-5	Support The Production Sector	
Project	TR 5-2	Improving the facilities of the public transport companies	
Intervention Area	All South Tunisia	Implementing agency	Min. Transport
Description			
<p>The facilities of public transport companies are the places where the buses are repaired (often combined with administrative services). Some are of good quality (Médenine for instance), others would benefit of upgrading works.</p>			
			
Figure TR 5-2-1 Maintenance workshop SRT Médenine (Médenine)		Figure TR 5-2-2 Inspection pit (<i>fosse de visite</i>) of SRT Gafsa (Tozeur)	
<p>It has not been possible during the project to visit all facilities, hence to estimate in detail which works should be done and to prioritize them. The above pictures show a sample of situations.</p>			
Action Plan			
Actions	Relevant organizations	Role	
– Establish a plan for equipment and priorities (each company)	<ul style="list-style-type: none"> – Ministry of Transport and DRTs – S3T follow up 	– A prerequisite: census of existing material and needs	
– Make a request for funding		– Systemization of the requests for funding must be made at the level of South Tunisia in order to obtain harmonized quality of the bus network at mid or long term.	
– Implement corresponding works		– The works are implemented under the supervision of each company. Joint reception of works to be made with the ministry of Transport	
– Establish a plan for maintenance		– At the time of the reception of works the company must submit a plan for the maintenance of corresponding facility.	
Indicator		Risk	
<ul style="list-style-type: none"> – The census is made – A plan for works to be implemented, their priority is defined by each bus company and endorsed by the ministry of Transport – Equipment is provided. – The maintenance scheme is established and undertaken. 		<ul style="list-style-type: none"> – No definition of plan. – Insufficient maintenance of equipment provided. 	

Strategy	TR-5	Support The Production Sector	
Project	TR 5-3	Renewing <i>louage</i> vehicles	
Intervention Area	All South Tunisia	Implementing agency	Min. Industry
Description			
<p>Public transport comprises autobus, coaches, taxis and <i>louages</i> (rented coaches). <i>Louages</i>, which have their dedicated parking areas in cities like buses, permit the public transportation of a limited number of people by vehicle, but represent together <u>58% of the trips</u> in public transport (source: ministry of Transport). Their strong points are: size, time, and flexibility. They are classified as follows:</p> <ul style="list-style-type: none"> - <i>louage à bande rouge</i> (rented-coach red stripes): inter-governorate transport (dedicated stations); - <i>louage à bande bleue</i> (rented-coach blue stripes): inter-delegations but intra-governorate. <p>There are various types and ages of <i>louages</i>. A financial facility for renewal of the fleet would facilitate the acquisition of new cars (better comfort, less consumption, better outlook towards potential clients, better overall safety of vehicles).</p> <p>This should also include facilities for the tourist industry. In Tozeur for instance,³⁶ there are 20 travel agencies, with 216 4x4 vehicles, 3 minibuses and one bus. Many of the corresponding tours are not “on demand” but scheduled as regular bus lines for public transport.</p> <p>The idea here is to provide incentives facilitating the conversion toward more modern vehicles, more comfortable, more environmentally friendly and safer, in view of better quality of public transport in the area (and until Sfax, Sousse and Tunis areas, also since some of these <i>louages</i> lines are long-haul lines).</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Creation of a financial facility supporting the purchase of new vehicles dedicated to public transport	- Ministry of Industry - Ministry of Finance	- Key point: the owner of the vehicles must have an incentive to facilitate their decision regarding the renewal of their vehicles.	
- Funding of the facility and definition of the conditions to benefit		- The criteria to fit and the dispositions and levels of funding must be clearly defined.	
- The facility is operative under its conditions (minimum age of vehicles concerned, duration of the program, etc.)		- The product has to be proposed. This facility can be created for the whole region or specific governorates/ delegations if support from corresponding entities.	
Indicator		Risk	
- Existence of the facility. - Definition of the criteria for benefiting of the facility and of the amount of the proposed support.		- Facility is not funded. - Criteria for obtaining a support are too lenient or too difficult to fulfill.	

³⁶ Vehicles registered in Tozeur governorate (source: DRT Tozeur)

Strategy	TR-5	Support The Production Sector	
Project	TR 5-4	Development of the Gabès port	
Intervention Area	Gabès	Implementing agency	Min. Transport/ OMMP
Description			
<p>The Gabès Port is located inside a dense urbanized/industrial area. The activity of the port, created in 1972, is dedicated towards chemistry: the Tunisian chemical Group (<i>groupe chimique tunisien</i> GCT) ensures 60% of the traffic.</p> <p>The total traffic during 1st semester 2012 was 625,183 tons. Cereals represent 16%, liquid bulk 16.5%, solid bulk 52.2%, hydrocarbon 9% and only 6% (36,448 tons) of “no unified goods” or <i>marchandises générales</i>. This perfectly illustrates the industrial characteristic of this harbor. There is of course pre-eminence of Europe among destinations, but the portfolio of Clients diversifies since 40% are from other geographical areas.</p> <p>The port of Gabès is connected in its both sides to the rail network of South Tunisia (this network has been built on purpose). Trains coming to Gabès port make a stop at Ghannouch station where they are dispatched and sent to the factories and the industrial complexes area. In addition, the cereals post and two other the posts on the harbour are directly serviced by rail.</p> <p>Regarding planned development, Gabès port has both advantages and challenges to face:</p> <p><u>- advantages:</u></p> <p>Industrial neighbours (STEG, phosphoric acid factory, DAP (di-ammonium phosphate) factory) provide regular activity to this facility;</p> <p>More than half of the phosphates (58.1% or 1,632,608 tons in 2013) transported by SNCFT transit via Gabès, either for direct export or for transformation in the factories on the site.</p> <p><u>- challenges:</u></p> <p>The entrance channel (3,220m, dredged at 13.5m) has space enough for one boat at a time;</p> <p>The path along the quay is of limited width, which makes the manipulation of containers uneasy;</p> <p>The port site is blocked in its development by its industrial neighbours (STEG, phosphoric acid factory, DAP factory). Development therefore has to be made offshore, by making the best use of its existing land or by reallocation of surfaces owned by the other entities, which might be costly;</p> <p>Phosphogypsum is a refuse, which has polluted the bay and must be removed. Even though the Port is not at the cause of this pollution, it has to be associated to cleaning activities and to mitigate its own emissions of pollutants.</p> <p>Other ports are located in the vicinity: Sfax (1h30 by road) and Skihra (40' by road).</p>			

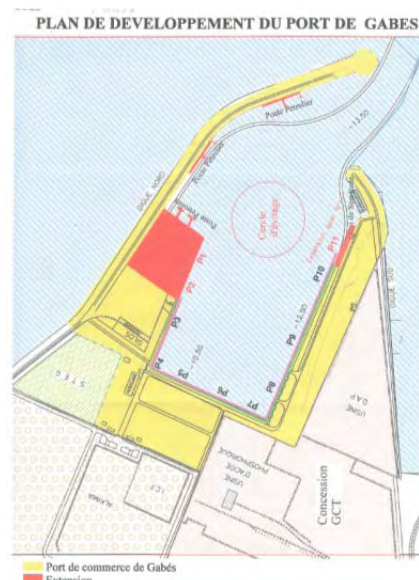


Figure TR 5-4-1 Gabès port development plan
(source: OMMP)

On a medium to long term basis:

- the depollution of the phosphogypsum should be achieved;
- Gabès harbor will increase its role as a dedicated harbour for specialised industry³⁷.
- a facility to handle containers is installed in the port (short or mid-term) on part of the area dedicated to industrial/agricultural commodities. In addition (MT), the OMMP building, the office of the national handling company *Compagnie Tunisienne de Manutention* and part of one industrial surface could be relocated in order

³⁷ Alternatively, corresponding industries could be moved to Skhira port with significant costs and impact on local employment.

to increase available space for storage and handling of containers in the port area.		
Action Plan		
Actions	Relevant organizations	Role
- Depollution of the harbor	<ul style="list-style-type: none"> - Ministry of Transport - OMMP - Port of Gabès authority - Ministry of Environment - S3T 	- Necessary for sustainable activity and good relations with the city (specific study to be made).
- Better servicing of nearby industry		- This action is already undertaken on a daily basis by the services of the port. This system has to be maintained and be a key partner in the initiatives for the technical development of ports area. The needs of the industry must drive the policy of development.
- Creation of a facility to handle containers		- Sea transport by container is increasing continuously. Therefore it is important for Gabès to benefit from a dedicated facility in order to handle this type of freight. Due to the limited space inside the harbor area, it might be necessary to reorganize the whole space at the entrance of the harbor (including existing buildings) in order to increase the available storage and handling capacity for the containers, even on a short term basis with medium to long-term storage facilities located in other spaces in the surrounding area.
Indicator		Risk
<ul style="list-style-type: none"> - The depollution is achieved - A systemic scheme of discussion between all stakeholders of the port area is constituted, formalized and developed. - The facility for containers is created and operative. 		<ul style="list-style-type: none"> - Pollution of the port remains a problem - The discussions occur on a case by case basis with no general scheme. - No facility to handle containers>

Strategy	TR-5	Support The Production Sector	
Project	TR 5-5	Development of the Zarzis port	
Intervention Area	Zarzis	Implementing agency	To be created

Description

The Zarzis Port³⁸ has lots of possibilities for development (135 ha of land secured aside the port) but no industrial hinterland at present. The following picture shows the facilities (red arrow), with aside the existing free trade zone (blue arrow) and the land reserve (green arrow). The ensemble formed by the 3 zones in coordination presents an interesting potential for development (light blue arrow):



Source: Google map

Figure TR 5-5-1 Aerial view of the Port of Zarzis

At present Zarzis Port has the smallest freight traffic in Tunisia compared to other ports managed by OMMP (except La Goulette nearby Tunis): no cereals, 5 berths with corresponding length of 950m, one mooring dolphin (*duc-d'Albe*) for petroleum products (import), 28 ha of platform, 2 warehouses (total: 9,000 m²), no facilities for containers.

As a result, 793,000 tons of freight was transported in 2013 for 576 boats berthing³⁹. The ratio export/import was 3.04 with a sharp continuous decrease in the exports (-53.5%). Traffic has been reduced by 45.5% since 2010 and comprises 72% of solid bulk (mainly salt), 24% of hydrocarbons and 4% of miscellaneous goods. More than 95% of the freight goes to Europe.

To be noted that offshore petroleum companies use the port as a basis to feed supply their drilling stations in Tunisia and in Libya. It is also the nearest port from Algerian oil fields.

In addition, it is located nearby the Libyan border and Western Libya, which can also induce activities, and the public maritime domain can increase the potential area to be developed until a surface of circa 1,000ha.

The development of the Zarzis Port is one of the keys of sustainable development of the area. The following favorable conditions have to be matched in order to permit this development:

- 1) There is at present no industrial activity which could constitute a hinterland (territory likely to use the port facility) for the port and provide goods to transport. The development of the Zarzis port must go hand-in-hand with the development of the port hinterland and the creation/ development of import-export activity;

³⁸ See OMMP Website : http://www.ommp.nat.tn/zarzis.php?code_menu=4&code_page=20

³⁹ Including 151 commercial boats. The peak in the number of boats berthing was reached in 2011 (total number of boats mooring 692 including 279 commercial boats), when a trade with Libya (mainly cars) was organized through Zarzis port.

- 2) Due consideration has to be made on the fact that hinterland of the Zarzis port also comprises part of the territory of Libya, with corresponding business opportunities;
- 3) The harbour area and the nearby city of Zarzis have to be re-motivated (*redynamisé*) because the activity of export of crude oil has ceased and the traffic in the port has decreased in recent years. It is necessary to create a new impetus, a new dynamic of development;
- 4) An important and stable supply of goods should be ensured to the Zarzis port in order to secure its activity and its development on a long-term basis. This should be done by the gypsum ore from Tataouine area⁴⁰ (quantities to be confirmed by specialized studies). The ore would be transported by rail to the Zarzis port (see proposal for project **TR 1-5**), and this track would also facilitate handling of goods in the port area and nearby;
- 5) In addition to gypsum ore, regular import/export activity has to be brought to the Zarzis port by the logistics park and the free trade zone to be created and developed near the port;
- 6) A connection of the Zarzis-Tataouine rail track (point 4 above) with the line of the high speed train has to be organized, if the high speed line is carrying freight transport (see proposals for projects **TR 1-3** and **TR 1-5**). In that case, the Zarzis port would be connected by rail to the whole region;
- 7) Connection with the Médenine - Ras Jedir highway has to be made by 2x2 lane road in order to have smooth and efficient road transport from and to the Zarzis Port (see proposal for project TR 2-11) ;
- 8) One or more scheduled maritime service(s) has to be created with one or more foreign destinations (Note: this line(s) will have a deficit during their first exercises, since it takes time for companies to re-organize their logistics)⁴¹;
- 9) The draught of the port has to be increased to 11 m minimum⁴², and maintained at this level (recurrent problem of accumulation of sand to be handled) (ongoing);
- 10) Facilities dedicated to containers (loading/unloading) and corresponding storage area have to be installed in the port area (including bonded and non-bonded storage areas);
- 11) Tourist activity should be developed, with boats mooring in the Zarzis port and their passengers visiting Zarzis city and the region of the *Ksour* nearby Tataouine⁴³.

OMMP has commissioned a study for the improvement of the port. The goal is to re-motivate activities and to find a strategic partner who might operate under a concession scheme the new economic pole of Zarzis constituted by the Port, the park of economic activities and the (future) logistic area.

The support of development partners to this project could take several forms (and several amounts; therefore a dedicated basket or baskets could be an appropriate tool):

1 – Prerequisite:

- Support to the creation of a public-private structure dedicated to the development project (this structure can take over from existing structures or could be created *ex nihilo* under the supervision of S3T);
- construction of the railway line to Tataouine (see proposal for project **TR 1-5**);
- purchase of equipment for this railway line (at least 2 locomotives, number of wagons depending on the quantity of ore extracted and transported to Zarzis, wagons for passengers in addition). The trip from Tataouine to Zarzis would be of 1 hour 30 minutes duration approximately;
- construction of facilities (stations, storage areas) on both ends of the line;
- construction of a station at the intermediate part of the line, at the intersection with the high-speed line (pending on characteristics the of traffic – passengers or passengers + freight – on the high speed line);

2 – Free trade zone / industrial area / logistic area (transport and infrastructure related issues):

- support to the development and servicing of the new area, in order to permit to propose for sale or rent lots already connected to all networks (electricity, water, sanitation, gas, telephone, broadband Internet, branch of

⁴⁰ Tataouine deposit is said to be the second in size in the world (the first one is located in Canada), with a rate of purity of gypsum of 98%.

⁴¹ Companies located in Zarzis area should be interested at first place, but companies from Médenine and Tataouine areas and from Western Libya may also consider appropriate connections, schedules and tariffs proposed.

⁴² The draught is 7.5m at present corresponding to a possibility to host ships of up to 15,000t. With a draught of 11 meters, Zarzis port could handle ships up to 30,000t;

⁴³ This tourist development can be considered in any case. This system should be “all inclusive” (tours fully organized: cruise + transport + visits + hotel and restaurants, with a system of package offers). This necessitates the establishment of a structured cooperation at the regional level with one or more tour operators.

- the rail network connected to selected facilities of production and areas of storage);
- support for transport of staff of these companies by creation of a specific bus servicing from Zarzis city centre with a bus stop to be installed off carriageway in the area;
 - servicing of this area by 2x2 lane road from highway A1 (see proposal for project **TR 2-1**);

3 – Port area:

- allocation of a berth for processing of the gypsum from Tataouine (storage place, handling facilities pending on packaging (bulk or processed materials));
- allocation of a berth for handling containers with appropriate berthing facilities and materials (gantry cranes, straddle-carriers, top-lifters...);
- reorganization of the port area with creation of a larger dedicated bonded logistic chain ;
- allocation (time-share or total pending on frequentation) of a berth dedicated to cruise boats with facilities for passengers (passenger terminal, parking place for buses and cars).

The development of this area necessitates lots of expertise, complementary skills and financing (public and private) in order to achieve an efficient and performing area in this part of South Tunisia.


Project management will be key.

Recommendation on this respect is that **a structure be created, gathering private and public stakeholder entities** (State ministries, ODS, S3T, governorate of Médenine, city of Zarzis, chamber of commerce, OMMP, handling companies, companies owning/renting facilities in the area, transport companies active in the area,, representatives of private investors and funding entities, etc.), in order to handle proper development.

Action Plan

Actions	Relevant organizations	Role
- Create an ad hoc entity in charge of the development of the area	- Ministry of Transport - Ministry of Equipment - Ministry of Industry - MDICI/ODS	- As seen, all components are interacting one with each other and cannot be addressed efficiently by separate bodies. A comprehensive structure must be created on the purpose.
- Creation of necessary rail and road infrastructure, of train and bus services to connect with Zarzis (staff)	- Governorate of Médenine - City of Zarzis - OMMP - Port of Zarzis - SNCFT - Bus companies - S3T	- The port must be in a position to interact with its environment by all transport means, road and train in particular. Corresponding infrastructures have to be built (train connection with Tataouine) or enlarged (2x2 lanes connection with A1 highway and servicing of the structure from the city of Zarzis facilitated).
- Development of the port area with a section dedicated to the handling of gypsum, and another section dedicated to the handling of general freight, in particular containers. Creation of an area dedicated to the storage and handling of containers inside the port area.		- Plan of development of the port area to be determined in line with the development of other activities (logistic area, industrial areas in the vicinity or in the hinterland of the port, activity of operation of gypsum ore facilities in Tataouine).
- Creation of a scheduled line of maritime transport with at least one international destination		- Necessitates financial support since the first years of activity of the line may not create enough profit.
- Creation of a berth dedicated to cruises.		- Pending on the development of tourism activity in the area and on arrangement between cruise company and local tour operators

Indicator	Risk
<ul style="list-style-type: none">- Creation of the entity and regular meetings ;- Creation of the infrastructure permitting and facilitating the development of the port area and of the economic activity in connection with the port;- Development of the port surface according to development of surrounding entities, including facility for containers- Creation of a maritime line- Creation and operation of a berth dedicated to cruises	<ul style="list-style-type: none">- The entity is not created and the actions are not coordinated- The infrastructure are not created or delayed, therefore delay in the development of the port area- The infrastructure for containers is not created,- No maritime line- No facility for cruise.

Strategy	TR-5	Support The Production Sector	
Project	TR 5-6	Development of freight transport by plane in South Tunisia	
Intervention Area	All airports	Implementing agency	Min. Industry/ Min. Transport
Description			
<p>The transport of passengers faces at present lots of uncertainties. Therefore, the related activity of airports of South Tunisia is not stable.</p> <p>In order to cope with the situation, a study could be implemented in the development of freight transport (mainly in direction of the European markets), as similar type of transport already exists.</p> <p>The present situation on that respect is the following, according to information obtained during the study:</p> <ul style="list-style-type: none"> - In Tozeur, there is almost no activity, the freight being mostly in connection with the pilgrimage to Mecca. The exports of goods from the airport date back to 1998 (export of cherry tomatoes to Brussels). - In Djerba, the maximum quantity has been reached in 2011 with 265 tons (for the whole year), equivalent to 7 38-tons trucks. - no information for the other airports of Gabès and Gafsa. <p>The development of this type of transport, which corresponds to a request of the markets for “ultra fresh” fruits and vegetables and maybe also for just in time industrial products should be confirmed by a detailed study.</p> <p>On that basis, if confirmation, services of transport could be organized on a regular basis, with combined trips organized for the four airports: Tozeur, Gafsa, Gabès and Djerba and also the airport of Sfax and other airports of Tunisia pending on the goods to be transported.</p> <p>Requirements for these products being higher (and their final price also, due to the necessity to include the costs of air transport into the price) they would have to be of an increased level of quality, which in turn would necessitate an increase level of skills at the level of the producers.</p> <p>Note: regarding Tozeur airport for instance, quantity of freight is limited despite an appropriate storage facility for freight and 20 ha of land reserve (<i>réserve foncière</i>) in the vicinity, which could constitute a logistics park on the long term (in line with the general development of the area). This kind of development will therefore necessitate continuous efforts to be implemented.</p>			
			
<p>Figure TR 5-6-1 Gabès-Matmata international airport Entrance of terminal</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Census of freight transport in South Tunisia and in Tunisia	- Ministry of Transport - OACA - Ministry of Industry - MDICI/ODS	- Several airports in South Tunisia have records of freight transported, plans to create freight transport and willingness to develop this type of transport. This has to be verified in order to have a proper view on the issue.	

<ul style="list-style-type: none"> - Survey to companies about the need of such transport and their willingness to pay pending on tariffs 	<ul style="list-style-type: none"> - S3T follow up 	<ul style="list-style-type: none"> - Looking for potential customers (detailed survey asking about type of product to be transported, quantities, etc.)
<ul style="list-style-type: none"> - Looking for a company suitable to implement such transport 		<ul style="list-style-type: none"> - Financial support has to be sought at the beginning, since this type of transport necessitates time to obtain and retain customers.
<ul style="list-style-type: none"> - Implementation of a test under a period of 1 year 		<ul style="list-style-type: none"> - This is a minimum period of time to test the profitability of the service.
Indicator	Risk	
<ul style="list-style-type: none"> - The study is made - The study shows good indication for profitability - The service is experimented - After one year the service is considered as viable - The service expands, as the activity, the number of destinations and the number of customers 	<ul style="list-style-type: none"> - The service is launched without study - The service is not known enough and therefore not enough customers - After one year, the experiment must be stopped without creation of a sustainable structure 	

Strategy	TR-5	Support The Production Sector	
Project	TR 5-7	Program for the development of logistics centers	
Intervention Area	All South Tunisia	Implementing agency	Min. Transport (Dir. Gl. Logistics)
Description			
<p>The transport chain also includes administrative part (e.g. customs), logistics, and a part of transport in smaller quantities to/from suppliers or end users. Logistic parks include:</p> <ul style="list-style-type: none"> • Management of flows in time and space; • Storage; • Wrapping up/labelling; • Grouping; • Assembly. <p>Logistic parks group these features on the same site, while taking advantage of their size to obtain additional facilities and incentives, which can be provided (single window (<i>interlocuteur unique</i>), networks and facilities like Internet broadband, long-term leases, high voltage, etc.). Combined with parks of economic activities, they can propose <u>production, commercial activities, storage and logistics</u>.</p> <p>In addition, these facilities may serve as (re)distribution centres, freight being downloaded from containers and transferred to smaller trucks in order to reach precisely their final distribution points (and in the other way round, massification of the transport of goods). Studies made in the scheme of the development of the Zarzis port area (see proposal for project TR 5-5) showed that most of the freight (71%) was transported by vehicles of small capacity (<i>véhicules de faible tonnage</i>) with a limited quantities of goods in each vehicle.</p> <p>The development of logistic/activity areas, linked with the development of container transport, the reduced loading of vehicles due to enforcement of the limit of axle loads, will be an asset to develop the economy of South Tunisia, in line with the evolution of the international trade⁴⁴.</p> <p>Mixed with activity parks, logistic parks are in a position to:</p> <ul style="list-style-type: none"> • Attract foreign investments; • Promote export; • Create jobs; • Create an impetus (<i>effet d'entraînement</i>) in the area and the region. <p>Logistics costs are said to represent at present 20% of the GNP in Tunisia, vs. 15% around in Morocco or Turkey. In addition, the rank of Tunisia in the global logistics performance survey (www.worldbank.org/lpi) has decreased in recent years after a maximum in 2012.</p> <p>The reduction of logistic costs is therefore of paramount importance.</p> <p>Regarding logistic centres two types appear: the main logistic centre of a company (or group of companies) and secondary logistic centres (warehouses or <i>plate-formes régionales</i>) realizing intermediate storage and facilitating quick delivery. These two types of centres are complementary. Some of them can also perform post-manufacturing in connection.</p> <p>Regarding positioning, the centres should be located not too far from populated areas (both for workforce, customers and manufacturing companies) and if possible near a node in the transport network proposing various transport modes and a large choice of destinations, both near and far. To sum up: <u>exchange areas, areas of production, areas of consumption</u>.</p> <p>When determining the possible positioning of such centres, the size of South Tunisia and its geography (no big obstacles for road transport and good quality infrastructure inducing reasonable transport times) must be taken into consideration.</p>			

⁴⁴ This is already the case for the ports of Radès (increase of the logistic zone under way) and Sfax.

Table TR 5-7-1 – Distances and transport times from Gafsa, horizon 2025 (example)

From Gafsa to:	Distance (approx.)	Type of road (MT)	Travel time (approx.)
Tozeur	93	Voie express	1h 10'
Gabès	150	Voie express	1h 40'
Sfax	260	Voie express	2h 15'
Zarzis	285	Voie express	3h 15'
Tunis	362	Highway	3h 20'

Average speed considered: 100 km/h on highways, 80 km/h on other 2x2roads

In addition, the quantity of goods to be stored has to be duly estimated (no bulk materials for instance), as the fact that logistic zones are also planned in Enfidha and Sfax. The issue has to be addressed at the national level, through structures like the National Council for Logistics (*Conseil National de la Logistique*) grouping the shareholders in the domain.

Regarding South Tunisia, based on past experience and ongoing activities, we can note the following:

- two logistics areas are already planned: one in Tozeur and one in Zarzis;
- Ghannouch train station nearby the industrial area of Gabès has a kind of function of logistics for rail transport, permitting to sort the flows of freight prior their arrival to Gabès port and industrial facilities;
- if the Ajim-Jorf bridge is constructed, the area nearby Mareth and the highway A1 nearby the city of Sidi Makhoulf will become the barycentre of important places of consumption.

To these main structures should be added smaller structures or *plate-formes régionales* near the main cities, if possible at a close proximity to industrial parks, in order to gather commercial, industrial, and services activities.

Note: the General Directorate for logistics and multimodal transport (*Direction générale de la logistique et du transport multimodal*) supervises this activity in the Ministry of Transport.

Action Plan

Actions	Relevant organizations	Role
- Census of planned logistic zones and their characteristics	<ul style="list-style-type: none"> - Ministry of Transport / DRT - Ministry of Equipment - Ministry of Industry - MDICI/ODS - S3T 	<ul style="list-style-type: none"> - Definition and sorting between main logistic centers (for a company, or massification of transport) and secondary logistic centers (intermediate storage, quicker delivery of goods). - Definition of corresponding surfaces.
- Definition of geographical priorities pending on industrial activity in the area.		<ul style="list-style-type: none"> - The surfaces located in areas with existing or planned economic activity in the short term may be more prone for a more early development. - The facility has to be connected to the trunk network (2x2 lanes roads) if possible with a connection to another mode of transport (plane, train, boat).
- Purchase of corresponding surfaces		<ul style="list-style-type: none"> - The surfaces have to be purchased. A system with in the initial stage a partial equipment of the land purchased for development may be appropriate in order to minimize the cost and adapt them to the evolution of the activity (<i>développement phasé de la zone</i>)
- Allotment and networks (<i>allotissement de la surface, voirie et réseaux divers</i>)		<ul style="list-style-type: none"> - Infrastructure works are a prerequisite: the companies coming to the logistic park must have really turnkey projects and no concern about support infrastructure

<ul style="list-style-type: none"> - Find a structure in charge of the exploitation 		<ul style="list-style-type: none"> - Necessary, since exploitation consists in selling parts of the area to companies but also in renting warehouses and/ or surface. In this case a specialized company is necessary, this company having also in charge the maintenance of the structure (lightning, waste disposal, security if not ensured by the general police).
<ul style="list-style-type: none"> - Sell or rent spaces to companies 		<ul style="list-style-type: none"> - The core work of the operating structure
<ul style="list-style-type: none"> - Operational phase 		<ul style="list-style-type: none"> - To be supervised by the operating structure, which must maintain permanent contacts with users but also with potential customers and with authorities in order to anticipate needs for development.
Indicator		Risk
<ul style="list-style-type: none"> - The needs are defined (What to store? How much? When? How long? Under which technical conditions?) - The positions of facilities are selected and prioritized. - The work starts - The structures are commissioned. - The structures are operated. 		<ul style="list-style-type: none"> - No prior study and concurrent structures. - Facilities are completely developed but only partially used at the beginning, generating wasted operative costs. - Operation of the structure does not give satisfaction to the users, hence any development and potential withdrawal of some customers.

Strategy	TR-5	Support The Production Sector	
Project	TR 5-8	Opening of additional border posts and improvement of existing ones	
Intervention Area	Governorates of Tataouine, Gafsa	Implementing agency	Customs Directorate (Douanes)
Description			
<p>The number of border posts in South Tunisia is scarce at present (two with Libya, one with Algeria) and this constitutes a difficulty and a hurdle for road transport due to the necessity of additional distance to travel.</p> <p>In order to cope with this situation, new border posts should be planned, <u>their opening being subject of course to other considerations as only transport considerations</u>. Therefore, no horizon for their opening will be indicated⁴⁵.</p> <p>- Border posts with Algeria: At present, only the border post of Hazoua is opened in the study area. If we consider an increase of the traffic both of freight and passengers, additional facilities may be considered:</p> <ul style="list-style-type: none"> - El Borma (south in the desert in Tataouine governorate), in connection with the Algerian oil fields area; - Ain El Ouchika (connection with Tamerza in Tozeur governorate, for passengers mainly); - Matrouha in Kébili governorate. <p>- Border posts with Libya: Two border posts exist: Ras Jedir (the main border post in the area) and Dehiba in the South. In addition a third border post could be created in Machhad Salah (creation postponed at present), and in the long term, a facility opened in Borj El Khadra.</p> <p>In addition, existing border posts sometimes face difficulties in handling all the freight, and their improvement should be planned the case being.</p> <p>In addition, the border post of Bou Chebka on the GP15, located north from the study area, accommodates lots of traffic South Tunisia-Algeria, and could be developed pending on traffic.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Definition of which border posts may be opened in the future and the corresponding horizon	- Directorate of Douanes - Ministry of Equipment - DREs - Related ministries - Governorates	- Long term planning of corresponding works and other works that can be made in connection.	
- Preparation of corresponding infrastructure (mainly roads)	- MDICI/ODS/S3T	- Studies, tenders, supervision of the works by the DREs or by a specialized consultant.	
- Commissioning of the infrastructure prior the opening of the border post		- Commissioning the infrastructure (including signaling since lots of transit traffic and definition of a plan for maintenance)	
Indicator		Risk	
<ul style="list-style-type: none"> - A plan is defined - Corresponding infrastructure is defined - Corresponding works are implemented until the trunk network (network of 2x2 lines connections) - The infrastructure is commissioned and maintained. 		<ul style="list-style-type: none"> - No planning making difficult any forecast regarding the need for infrastructure - Late planning of corresponding works which cannot be fully operational by the time of the opening of corresponding border post. 	

⁴⁵ Note: this proposal does not address the point of the customs facilities in the ports of Gabès and Zarzis.

Strategy	TR-5	Support The Production Sector	
Project	TR-5-9	Elaboration of structured development scenarios for public transport in the Djerba Island	
Intervention Area	Governorate of Médenine	Implementing agency	ODS (coordinator)

Description

During this development study, consideration has been given to the Djerba Island, with in particular a proposal for the creation of a bridge between Ajim and Jorf in the western part of the Island (see proposal **TR 1-10**).

This bridge would re-equilibrate the road traffic (now mainly through *chaussée romaine* or slow through the ferry link) and may have implications and consequences on the development of the island as a whole (the part nearby Ajim being less developed at present).

Hence, the general scheme of the transport on the island must be reviewed taking into consideration the new status of Ajim and a planned increased of traffic in the area, which lags now behind the other parts of Djerba in terms of population.

The modifications in the structure of traffic may also lead to increased number of trips but also to increased number of stays of tourists (one-day basis or longer stays) with consequences on:

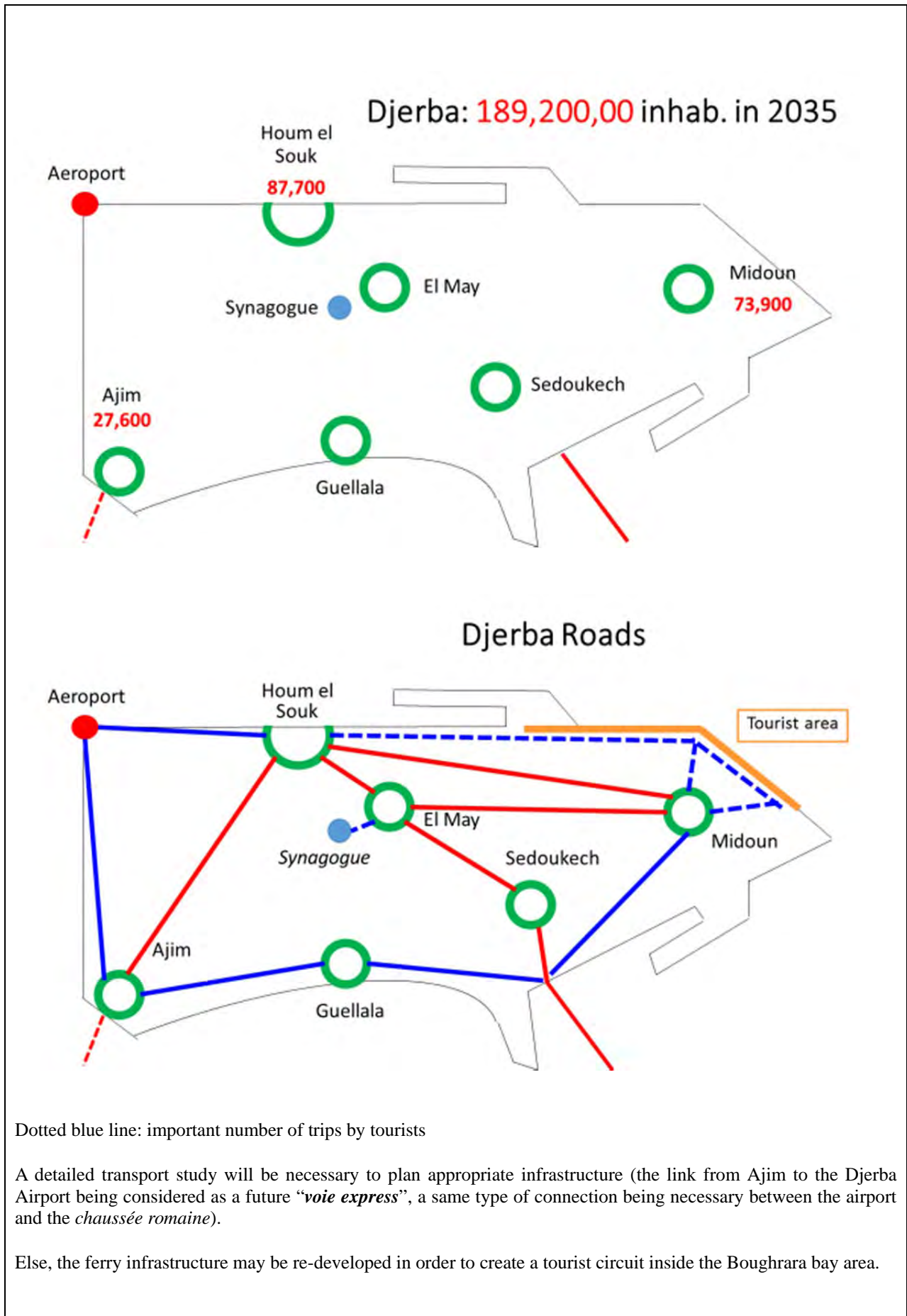
- **Transport for all modes**, including the soft modes (bicycles, 2-wheelers, *calèches*...);
- Development of the **tourism industry** (coastal, inland);
- Impact on the **water** consumption and use;
- Impact on the **environment**.



Source: Wikipedia

Figure 5-9-1 Djerba Island and connections to mainland

The issue is to develop the island while preserving its merit/name: “*Djerba la douce*”, Sweet Djerba.





Travellers at Houm el Souk bus station



Street in Midoun



Jorf to Ajim Ferry



Fisherman's boats in the port of Boughrara

In addition, local servicing by urban transport has to be developed using appropriate means (dedicated lanes and circuits, BRT type, tramway type, etc.), to be selected pending on analysis. The two categories of population of the island (inhabitants and long-term residents, short term tourists and visitors) have to be duly considered.

This study shall also consider aspects related to agriculture, industry, trade and tourism, having also in mind the social and environmental considerations.

Action Plan

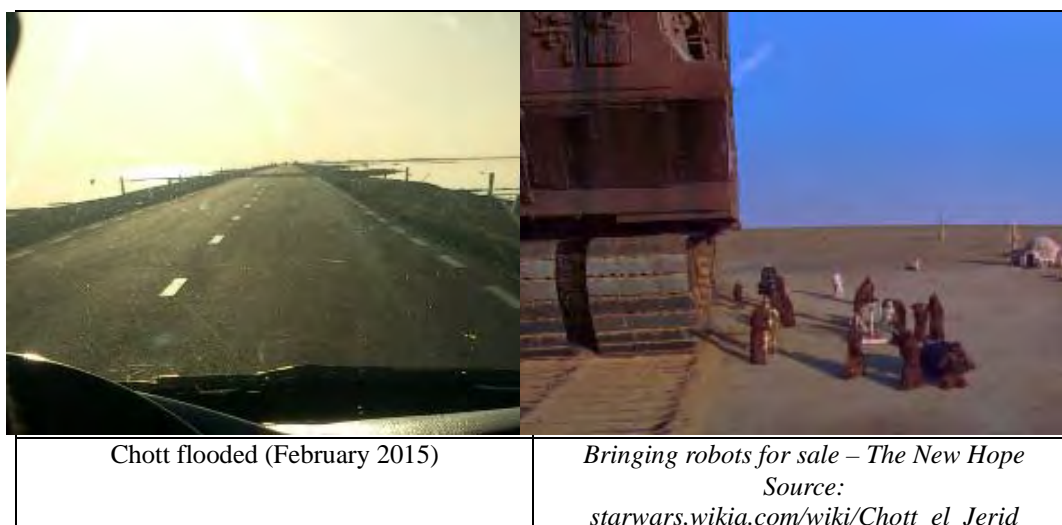
Actions	Relevant organizations	Role
– Basically the same ToR than those of this general study on the six governorates, with a focus on the Djerba island	Same than for the general study on the 6 governorates: all ministries, governorate of Médenine, all cities of Djerba, local stakeholders, ODS and S3T	Dito present study.
Indicator		Risk
– The study is realized – The recommendations of the study are implemented. – Djerba Island develops smoothly.		– No impact study is implemented before (i) construction and (ii) commissioning of the bridge (if decision of construction taken); – Recommendations from the study are not totally taken into consideration, totally or partially.

Strategy	TR-5	Support The Production Sector	
Project	TR 5-10	Structured development scenarios for infrastructure in Kébili governorate	
Intervention Area	Governorate of Kébili	Implementing agency	ODS (coordinator)
Description			
<p>The governorate of Kébili has a specific position in South Tunisia, with no direct access to the sea and no underground mining ores identified up to now, no train station, no airport and no high capacity road.</p> <p>Hence, particular care has to be allocated to its development in terms of infrastructure in the scope of this project, in order to preserve and promote its advantages: agriculture, tourism and Sahara, and to further develop the activity with an objective of bridging the gap with the other areas of South Tunisia.</p> <p>The present proposal introduces a combination of individual actions seen during the scope of the project, related to various strategic themes in the domain of transport. Furthermore, a proposal will be made for their prioritization and sequencing in terms of timing.</p> <p>Step 1: increase the possibilities of mobility under the current situation</p> <p>People complained about poor quality or lack of links with Gabès (mainly transfer to train) and Tozeur (mainly transfer to planes). This situation can be improved by creating 2 dedicated <u>fast speed bus lanes</u> :</p> <ul style="list-style-type: none"> - Douz – Kébili (bus, <i>louage</i> station, center) - El Hamma - Gabès train Station – Gabès bus station - Douz – Kébili (bus, <i>louage</i> station, center) - Degueche - Tozeur bus station – Tozeur airport <p>These buses would be new <u>dedicated materials</u>, long-haul buses (<i>bus de grand tourisme</i>) with livery paint mentioning “Express transport Kébili Douz” or equivalent. The naming is important since these buses should be used by inhabitants at first but also promote tourism to Kébili region both by foreign and local tourists.</p> <p>Basically and technically, buses’ schedules should be planned in such a way that they arrive at least 20 minutes before the departure of the train and 1 hour and a half before the departure of the plane, and that they depart from station and airport 30 minutes after the <u>actual</u> arrival time of plane and train, in order to catch up with possible delays.</p> <p>Other schedules can be planned during the day/ week pending on activities (home-work commuting, market...). These schedule will be advertised both on Internet and at the bus stops,</p> <p>Step 2a (medium term) : Improve the state of main roads and upgrade them to tourist roads (see TR 4-2)</p> <p>There are two main routes:</p> <ul style="list-style-type: none"> - Kébili - Gabès - Kébili-Tozeur <p>Kébili-Tozeur possesses a unique feature: Chott el Jerid, which should be emphasized and developed as an attraction for tourists and as a <u>landmark</u> for all South Tunisia.</p> <p>In fact, it is because of its unique feature that South Tunisia has been chosen to serve as set for several episodes of the cult movie Star Wars (see: http://starwars.wikia.com/wiki/Chott_el_Jerid).</p> <p>The development of Chott infrastructure can be considered as follows:</p> <ul style="list-style-type: none"> - Designate the road link over the Chott as a strategic cultural property for (South) Tunisia (the inscription to the list of UNESCO’s world heritage sites has been requested since 2008); 			

- Rejuvenate the road link by:
 - Cleaning the structure and its surroundings;
 - Dredging when needed in order to ensure stability under rain ;
 - Reorganize the platform : road, 2-modes path, footpath, place for rail track (1 way);
 - Create ephemeral attractions along the link (light shows, etc.);
 - Create small attractions at regular or irregular places along the link (small size if possible taking into consideration the reduced space of the platform (individual handicraft shops);
 - Create a larger attraction, “Chott Center” (*tentative name*), in the middle of the Chott with souvenir shops, museums - why not one part dedicated to the Star Wars saga since several parts have been filmed in South Tunisia and since the Star Wars brand is well known? -, showcase of the economic activities in the governorate and in the region...;
 - At the level of each “attraction/place of interest”, a roundabout to slow down traffic.

As often as possible, the Chott has to be preserved and enhanced. With such an improvement, the area will become the key point of a cultural trip, and the road will become one of the milestones for the route of the *ksour*.

Note: the factory for extracting salt on the Chott should have its own entrance-exit, with a roundabout.



Step 2b: improve other liaison roads in the governorate and support structures

Apart from this specific structure, several roads should be developed and improved:

- Kébili – El Hamma;
- Kébili-Douz
- Kébili-Gafsa;
- Kébili-Matmata;
- Douz-Matmata;
- Douz- El Hamma;
- Douz-Hazoua

Also, pending on traffic, it can be considered to open a new border post with Algeria in the area of Matrouha.

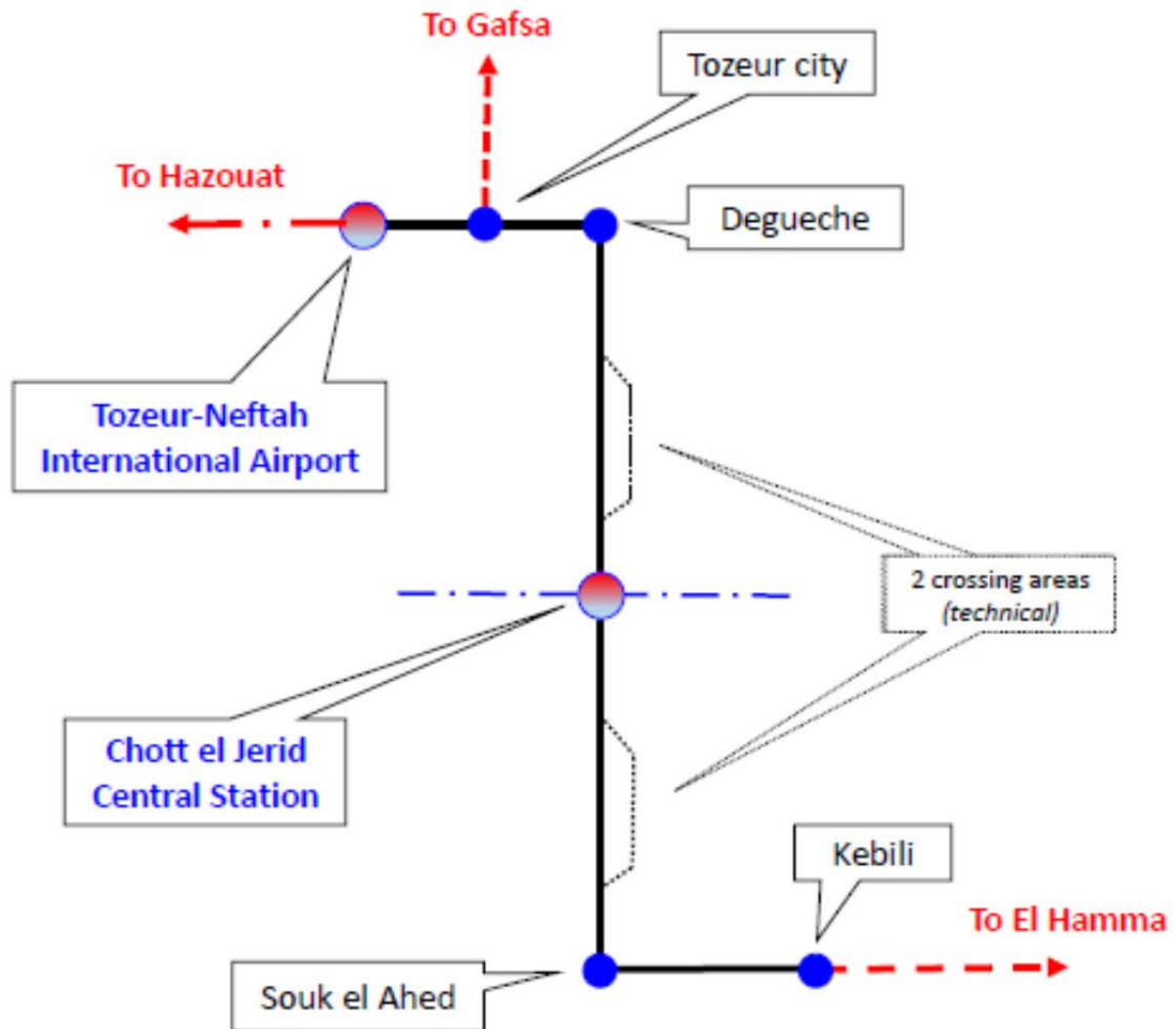
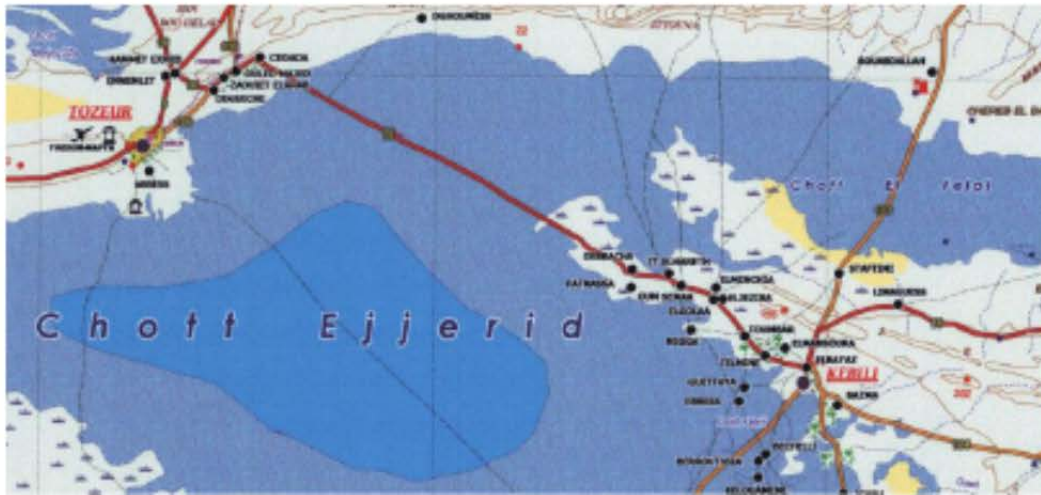
Step 3 (medium to long term): develop a railway network

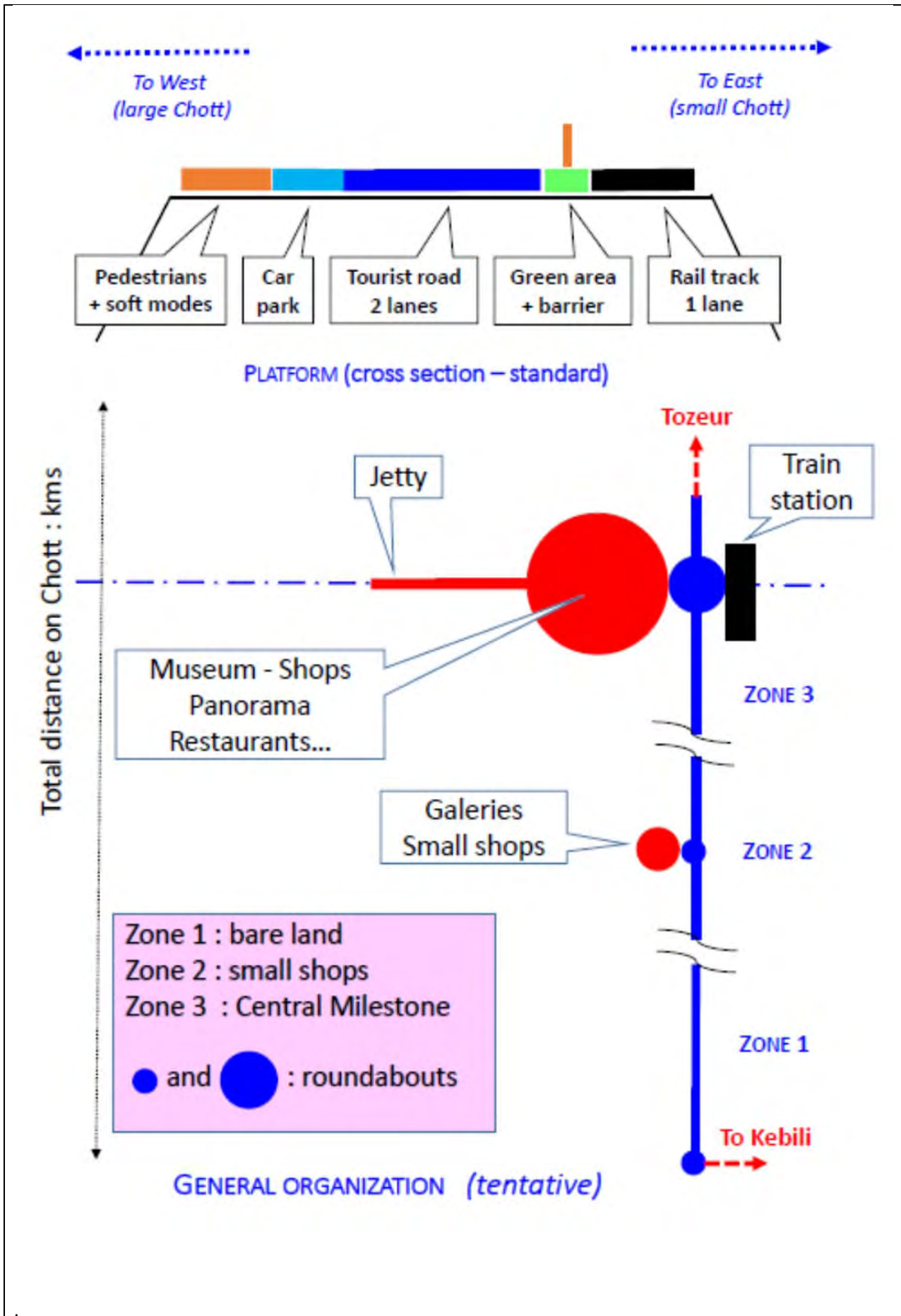
If results in terms of traffic are satisfactory, the frequentation will have increased, both from Tunisia and outside of Tunisia.

Hence it will be more practical to organize a transport by train and to create a railway route Gabès-El Hamma (see project **TR 1-4**) El Hamma – Kébili-“**Chott Center**” at the middle of the Chott (with a train stop at this level and large parking facilities)-Degueche-Tozeur, then north to Metlaoui, Gafsa or west to north Tunisia and to Algeria.

See here after a few diagrams presenting this proposal.

General view - Rail system





Action Plan		
Actions	Relevant organizations	Role
- Buy buses and authorize corresponding transport	- SRT Gafsa - SRT Gabès	- Creation of 2 new lines with new buses and new schedules and operation.
- Create the structure for the project	- SNCFT - Governorate of Kébili - Governorate of Tozeur	- This project being on 2 governorates and including numerous stakeholders, it is necessary to create an <i>ad hoc</i> structure for smooth implementation
- Assess the Chott link (structure, environmental and cultural constraints, property rights...)	- Governorate of Gabès - Ministry of Transport; - Ministry of Equipment;	- Min. Equipment (DRE Kébili and Tozeur), ministry of agriculture for agricultural lands;
- Reinforce and extend if necessary the structure of the link, and make it not subject to inundations	- Ministry of Environment; - Ministry of Tourism - Ministry of agriculture	- Ministry of Equipment (check standards both for roads and for rail tracks)
- Develop the link (can be develop part by part, starting by the “Chott Center” as a milestone)	- Local economic organizations ; - Local artists.	- Governorates and cities, ministries of Tourism and culture, private entities...
- Create a rail track on the Chott link and to Kébili and Tozeur (beware of adverse effects of salinity)		- SNCFT
- Create a station ad mid-term at Kébili, Degueche and at the airport		- SNCFT + Governorates, under supervision of the ministry of Transport
- Commission the train (2 cars)		- SNCFT
- Operate and maintain the train and the stations		- SNCFT + governorates
Indicator	Risk	
<ul style="list-style-type: none"> - The buses are bought - The buses are commissioned - The studies of the structure of the Chott are made - The Chott link is improved - The midway attraction is created - The midway attraction operates - Other attractions are created ; - The rail track is built - The new train is commissioned; - The new train is profitable. 	<ul style="list-style-type: none"> - No additional specific buses bought ; - No studies implemented for the link ; - No interest for the attractions (main one, small ones); - Not enough traffic in order to justify the creation of a rail link ; - No rail track built ; - No new trains commissioned; - No adequate maintenance in the new train, the stations and the attraction areas, resulting in a decrease in the number of clients/users. 	

3.3.2 Water Supply and waste water treatment

(1) Summary of current situation

The water supply issues in the southern region have to be considered for each type: agricultural water usage, residential water usage, and industrial water usage and wastewater treatment.

Currently, water supply and demand is being met by relevant organizations; however, considering future development of each industry, more water supplies are necessary.

In this section, based on the current situation and the country's development policy for the future, proposed strategies for the water sector are introduced.

(a) Agricultural water

The main water source for agricultural water is shallow or deep underground water, which is also used by other areas including residential and industrial. In the eastern region, brackish water desalination plants produce residential water, but in the western region, there are almost no plants operating. Currently, 75% of all demand in Tunisia is for agricultural consumption.

(b) Residential water

Currently, around 20% is for residential consumption. Water sources are underground water, and desalinated brackish water, which are mainly used in the eastern region. The connection ratio with potable water networks is high; almost 100% in urban areas and an average of approximately 95% of houses are connected.

(c) Industrial water

In Tunisia, especially in the southern region, industries are not yet well developed. Due to a shortage of water, big industries that require large quantities of water, such as chemical industries, are not located in this area. As a result, there is not much industrial water consumption except for tourism, which has a comparatively small consumption.

(d) Wastewater treatment

In the southern region, the connection ratio with wastewater collection networks is low compared with the northern region because houses and factories are not densely concentrated. Treated wastewater is discharged after secondary treatment in a wastewater treatment plant. A small amount of treated water is used for some limited applications, such as general and golf course irrigation and others.

(2) Demand forecast

In this section, SONEDE's forecasted demand and additional required water quantity, which will be created by this JICA project, are introduced. The water demand for agriculture is not included, but agricultural processing industries, which are categorized as "industrial water", are considered.

(a) Agricultural water

Wells are the source used for agricultural water. In order to increase the supply quantity for agricultural usage, reducing the supply of well water for residential and industrial use is recommended.

For this purpose, desalination plants and transmission pipelines are under construction. In addition, reuse of treated water from wastewater treatment plants is being studied. Details are given in Section 3.3.2 (3) (b) WA-2, (c) WA-3 and (d) WA-4 below.

(b) Residential water and Industrial water, based on current economic growth

According to SONEDE headquarters, the demand forecast is as shown in Table 3.3-33. Basic data was supplied by SONEDE, in a presentation by SONEDE on 10 November 2014, in Tokyo, and was studied by JET. This study procedure was discussed and agreed with SONEDE headquarters on 20 February 2015. The study process is as follows.

Step 1: Demand in the south-eastern region

Demand predictions for Djerba in 2015, 2025 and 2035 was given in SONEDE's Tokyo Seminar, see Table 3.3-33.

Demand predictions for other areas except Djerba in 2025 and 2035 was also supplied by SONEDE, see Table 3.3-33. The proportion of the total demand for these two areas was reviewed by JET (JICA Expert Team) and Djerba was estimated to be 32% of the total for 2015, other areas, 68%.

Total demand in this region was estimated to be 200,000m³/day for 2015, 255,000m³/day for 2025 and 314,000m³/day for 2035.

Table 3.3-33 Water demand in the southeastern region

1. Demand in 2015 – Region (SONEDE Nov 20, Tokyo)		1. Demand in 2015 – Usage (estimated by JICA team)	
proportion			proportion
32%	Djerba: 64,000 m ³ /d	For Residential water: 158,000 m ³ /d 1,008,000 person x 110l/p/d ÷ 0.7 = 158,000	80%
68%	Other than Djerba: 136,000 m ³ /d	Industry & Tourism : 42,000	20%
100%	Total : 200,000 m ³ /d	Total : 200,000 m ³ /d	100%
2. Demand in 2025 – Region (SONEDE Nov 20, Tokyo)		2. Demand in 2025 – Usage (estimated by JICA team)	
33%	Djerba: 83,000 m ³ /d (33%)	For Residential water: 180,000 m ³ /d 1,108,000 person x 130l/p/d ÷ 0.8 = 180,000	70%
67%	Other than Djerba: 172,000 m ³ /d	Industry & Tourism : 75,000	30%
100%	Total : 255,000 m ³ /d	Total : 255,000 m ³ /d	100%
3. Demand in 2035 – Region (SONEDE Nov 20, Tokyo)		3. Demand in 2035 – Usage (estimated by JICA team)	
34%	Djerba: 108,000 m ³ /d (34%)	For Residential water: 194,000 m ³ /d 1,165,000 person x 150l/p/d ÷ 0.9 = 194,000 m ³ /d	60%
66%	Other than Djerba: 206,000 m ³ /d	Industry & Tourism : 120,000 m ³ /d	40%
100%	Total : 314,000 m ³ /d	Total : 314,000 m ³ /d	100%

Proportion: estimated by JET

Source: SONEDE, adapted by JET

Step 2: Demand in by usage in the south-eastern region

An estimation of water consumption per capita is shown in Table 3.3-33, and has been agreed with SONEDE headquarters. Water loss rate has also been discussed and agreed. As a result, the consumption per capita and loss rate were respectively determined to be 110 litres/day/person and 70% for 2015, 120 litres/day/person and 80% for 2025, and 130 litres/day/person and 90% for 2035. Therefore, the residential water demand was forecasted to be 158,000m³/day for 2015, 180,000m³/day for 2025 and 194,000m³/day for 2035.

The difference between the total water demands calculated in Step 1 and the above residential water demands is accounted for by industrial water. Industrial water was predicted to be 42,000m³/day for 2015, whereas residential water was predicted to be 158,000m³/day. The ratio of the two usages was checked by JET and was found to be 1:4 for 2015. According to SONEDE and Ministry of Agriculture,

75% of water is used for agriculture, 20% is used for resident purposes and the remaining 5% is used for industry; in other words, the ratio of residential water (20%) to industrial water (5%) is 4:1.

The proportion of industrial water will be 30% by 2025, and 40% by 2035 as shown in Table 3.3-33. This change can be explained by industrialization in this area.

Water demand in the south-eastern region based on SONEDE's Tokyo Seminar is shown in Table 3.3-34.

Table 3.3-34 Forecasted water demand in the southeastern region

Refer to	Slide 28			Slide 33			Total (South East)	
	Djerba		Ratio to All South East (%)	Tataouine +Medenine (except Djerba)	Gabès	Sub Total (All south east, except Djerba)		
Year	A (l/s)	m3/d		B (mio m3/year)	C (million m3/year)	B+C (million m3/year)	m3/d	Round figure (m3/d)
	increase ratio	=AX3600X24/1000					=(B+C)x1000/365	
2015	742	64,109	32%				136000	200,109
2016	762	65,837					(by JET)	
2017								
2018	802	69,293						
2019								
2020	844	72,922						
2021								
2022	889	76,810						
2023	912	78,797						
2024	935	80,784						
2025	960	82,944	33%	36.2	26.7	62.9	172,329	255,273
2026	985	85,104						
2027								
2028	1037	89,597						
2029								
2030	1091	94,262						
2031	1122	96,941						
2032	1152	99,533						
2033								
2034	1212							
2035	1246	107,654	34%	44.7	30.5	75.2	206,027	313,682

Base data source: SONEDE, Blue figure is estimated by JET.

Projection of population growth in this region by JET is shown in Table 3.3-35.

Table 3.3-35 Forecasted population

	2015	2025	2035
Gabès	376,172	413,796	435,181
Medenine	481,898	529,216	556,565
TaTaouine	150,248	165,386	173,933
South East Total	1,008,317	1,108,398	1,165,680
Gafsa	338,987	390,271	410,440
Tozeur	108,440	121,276	127,544
Kébili	157,785	175,085	184,133
South West Total	605,211	686,633	722,118

Source: JET

Water consumption quantity is shown in Figure 3.3-21. This is from a 2004 report by the Japanese Ministry of Land, Infrastructure, Transport and Tourism (MLIT). The data is slightly dated; however, the trend of consumption vs. GDP per capita in Figure 3.3-21 is useful for confirming the situation of Tunisia. GDP per capita in Tunisia is around 4,000 USD and the average proportion of residential

water constitutes 30-33% of the total residential and industrial water demand (database: Same report by MLIT). Based on these figures, the consumption of water in Tunisia is estimated to be around 110 litres/day/person.

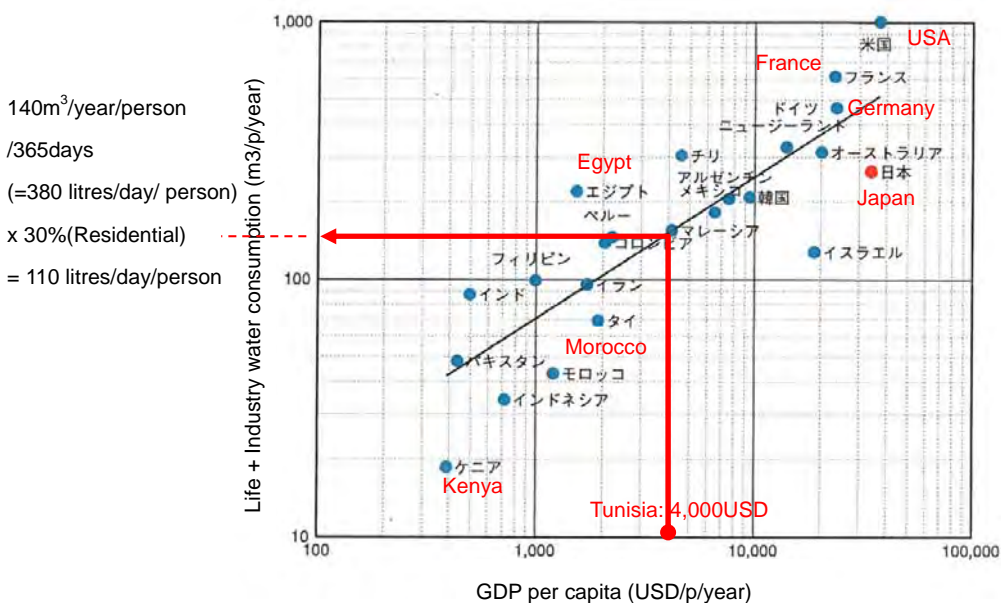


Figure 3.3-21 Industry and Residential water consumption quantity per capita vs. GDP per capita
Database: MLIT, Japan

Step 3: The southwestern region

The same procedure has been applied for the south-eastern region. Results are shown in Table 3.3-36. Note that industrialization is less than in the eastern region.

Table 3.3-36 Water demand in the southeastern region

1. Demand in 2015 (estimated by JET)		2. Demand in 2025 (estimated by JET)		3. Demand in 2035 (estimated by JET)	
	proportion		proportion		proportion
For Res'l water: 95,000 m ³ /d 605,000 person x 110l/p/d ÷ 0.7 = 95,000 m ³ /d	80%	For Res'l water: 110,000 m ³ /d 687,000 person x 130l/p/d ÷ 0.8 = 110,000 m ³ /d	75%	For res'l water: 120,000 m ³ /d 722,000 person x 150l/p/d ÷ 0.9 = 120,000 m ³ /d	70%
Industry & Tourism : 25,000	20%	Industry & Tourism : 35,000	25%	Industry & Tourism :	30%
Total : 120,000 m ³ /d	100%	Total : 145,000 m ³ /d	100%	Total : 170,000 m ³ /d	100%

Proportion: estimated by JET

Step 4: Water demand in the southern region as a whole

Total demand in the southern region for residential and industrial water was estimated from the above data.

Around 424,000m³/day is required to meet the total demand, without considering water demand of this Project.

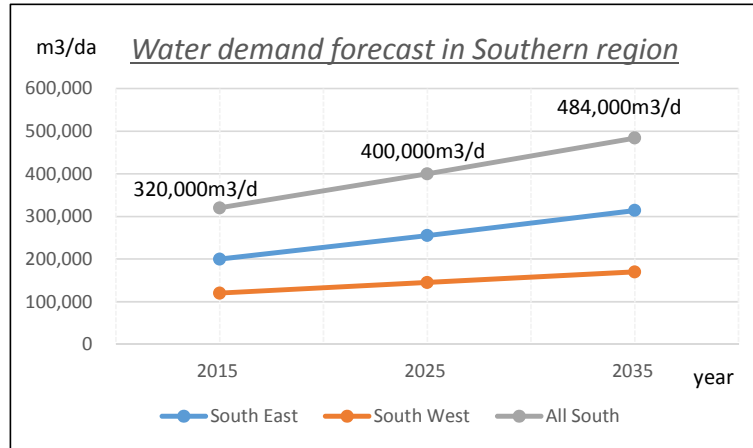


Figure 3.3-22 Water demand forecast in the southern region

(c) Additional Industrial water, based on JICA expert team's strategy

Industrial specialist team has studied a selection of the most suitable industries for the southern region, as shown in Table 3.3-37.

This table does not show the total quantity of water required for all the industries, but based on this recommended industry list, water demand has been estimated as follows.

(i) Agriculture industries

This has already been estimated.

(ii) Other industries

This table shows industries that have large water consumption. Industries that do not require large amounts of water are not listed, such as steel industry, chemical industry, petro-chemical industry and pulp-paper industry.

(iii) Tourism industry

The increased demand from an increasing number of hotels and beds has already been considered in SONEDE's forecast in Table 3.3-34 and Table 3.3-36. Other than SONEDE's forecast, no amusement centres or special tourism facilities are proposed by this Project. Therefore, there should be no additional water demand by tourism industry.

(iv) Conclusion

Considering the above-described situation, additional required water shall be provided by realization of this project. This study proposes that the project budget be used to construct two new 2,000 m³/day desalination plants for the eastern region and three new 1,000 m³/day brackish water desalination plants for the western region by 2035. This study tentatively proposes that 3,000m³/day of the above capacity be realized by 2025: one 2,000 m³/day and one 1,000 m³/day brackish water desalination plant, and that the remaining 4,000m³/day be constructed afterward.

Table 3.3-37 Required water quantities for planned industries in the southern region

Gabès												
Sector	Particular Products	Req'd Process Area (Ha)	m3/year	m3/day								
Agriculture	Red Meat Processing	1	36,680	100								
	Dairy Products & Milk	1	30,000	82								
	Processing Products of Black Acid	12										
	Olive oil	2.5	6,000	16								
	Dates	3	52,000	142								
	Fishery Processing	1	16,000	44								
Industrial	Limestone											
	Marble Stone											
	Phosphate											
	Chemical (Bulk)											
	Chemical (Container)											
	Cosmetic Products	2										
Tourism	Textile Products	3										
	Common											
Gabès Total		amma & Gabès West 12	140,680	385								
		Gabès South 13.5										
Medenine												
Sector	Particular Products	Req'd Process Area (Ha)	m3/year	m3/day								
Agriculture	Olive (Oil)	10	30,000	82								
	Red Meat	2	9,000	25								
	Dairy Products & Milk	1	4,000	11								
	Fishery Products	0.5	4,000	11								
	Dates (Process+Package)	5	100,000	274								
	Processing Products of black acid	6										
Industrial	Marble Stone	3										
	Limestone	8										
	Gypsum (Container)	2										
	Cosmetic Products	3										
Tourism	Textile Products	7										
	Common											
Medenine Total		Medenine Center 10	147,000	403								
		Zarzis 30										
Tataouine												
Sector	Particular Products	Req'd Process Area (Ha)	m3/year	m3/day								
Agriculture	Red Meat Processing	1	4,500	12								
	Olive oil	2.5	6,000	16								
	Dairy Products											
Industrial	Gypsum (Bulk)	8										
	Gypsum (Container)	2										
	Limestone	5										
	Marble Stone	4										
	Cosmetic Products	2										
	Textile Products	1										
	Leather											
Tourism	Cosmetics											
	Common											
Tataouine Total		Tataouine South East 15	10,500	29								
		Tataouine South 6										
		Tataouine Center 6.5										
South East Total		93	298,180	817								
including others 2,000 m3/d x 2 units Independent brackish water desalination plant 2,000 m3/d by 2025, and additional 2000 m3/d will be by 2035												
Gafsa												
Sector	Particular Products	Req'd Process Area (Ha)	m3/year	m3/day								
Agriculture	Olive (oil)	2.5	6,000	16								
	Dates	1	16,000	44								
	Red Meat	0.5	3,300	9								
	Milk & Dairy Products	1	120,000	329								
	Processing products of black acid	5										
Industrial	Phosphate											
	Marble Stone	2										
	Limestone	3										
	Textile	10										
	Cosmetics	2										
Tourism	Common											
	Gafsa Total	Gafsa 27	145,300	398								
including others 1,000 m3/d x 1 unit Independent brackish water desalination plant in each governorate												
Tozeur												
Sector	Particular Products	Req'd Process Area (Ha)	m3/year	m3/day								
Agriculture	Dates	3	105,000	288								
	Red Meat	1	2,400	7								
	Greenhouse Vege.											
Industrial	Textile	2										
	Cosmetics	2										
Tourism	Common											
	Tozeur Total	Tozeur 8	107,400	294								
including others 1,000 m3/d x 1 unit Independent brackish water desalination plant in each governorate												
Kébili												
Sector	Particular Products	Req'd Process Area (Ha)	m3/year	m3/day								
Agriculture	Dates	5	112,500	308								
	Red Meat											
	Greenhouse Vege.											
Industrial	Limestone	5										
	Cosmetic Products	2										
Tourism	Textile Products	1										
	Common											
Kébili Total		Kébili Center 5	112,500	308								
		Kébili East 8										
South West Total		48	365,200	1,001								
South Grand Total		141	663,380	1,817								
including others 1,000 m3/d x 1 unit Independent brackish water desalination plant in each governorate One (1) set will be by 2025, and remained two (2) sets by 2035.												
Additional water supply quantity (m3/d)												
<table border="1"> <thead> <tr> <th></th> <th>-2025</th> <th>-2035</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td></td> <td>3,000</td> <td>4,000</td> <td>7,000m3/d</td> </tr> </tbody> </table>						-2025	-2035	Total		3,000	4,000	7,000m3/d
	-2025	-2035	Total									
	3,000	4,000	7,000m3/d									

From Table 3.3-37, additionally required water is estimated to be 7,000m³/day. See Figure 3.3-23. This quantity of water should be included in the proposed Project. Construction and operation could be managed by SONEDE or local industries. This shall be studied in more detail later.

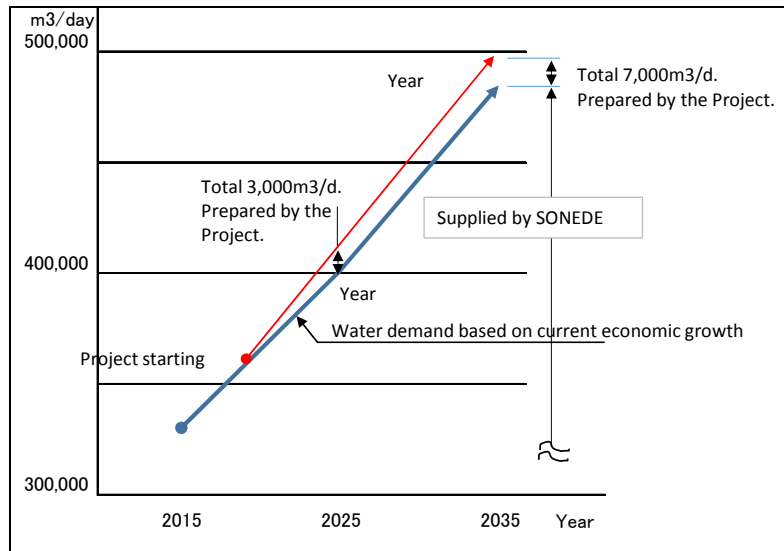


Figure 3.3-23 Additionally required water

(d) Wastewater treatment

An increased capacity for wastewater treatment is required because of increased supply and consumption of water. An action plan is discussed in Section.3.3.2 (4).

(3) Strategies and plans

Based on current issues and the results of the demand forecast, the following four strategies in Table 3.3-38 are proposed in order to develop suitable industries in the southern region.

Table 3.3-38 Water-related strategy for the development of the southern region

Code	Strategy	Effect (Direct / Indirect)			Indicator
		Value-added	Job creation	Sustainability	
WA-1	Increase of water for agricultural use			Conservation of natural water resources.	• 65% of residential water will be provided by desalinated water sources by the year 2025.
WA-2	Increase of water for residential use	Connection of networks to major cities/towns.	Increase of desalination plant employees.	Conservation of natural water resources.	• 65% of residential water will be provided by desalinated water sources by the year 2025.
WA-3	Increase of water for industrial use	Improvement of desalination plants and WWTP treatment processes.	Improvement of desalination plants and WWTP processes. Increase in employees.	Conservation of natural water resources.	• 65% of residential water will be provided by desalinated water sources by the year 2025. • 5% of discharged water from ONAS's WWTPs will be reused by the year 2025.
WA-4	Increase reuse of treated wastewater	Improvement of wastewater treatment network.	Increase in WWTPs and employees	Protection of natural environment and prevention of water diseases.	• 5% of discharged water from ONAS's WWTPs will be reused by the year 2025.

Source: JET, (note) WWTP: Wastewater treatment plant

(a) WA-1: Increase of water for agricultural use

(i) Objective of the strategy

The objective of the strategy is to increase water for agricultural use by reducing the supply of underground water for residential and industrial usage.

(ii) Direct/Indirect Effect

The strategy aims to have following direct and/or indirect effects on the local economy and social and environmental sustainability:

- 1) Increasing the well water supply to the agricultural sector
- 2) Conservation of natural water resources

(iii) Indicators

In order to measure the effect and impact of the strategy by the year 2025, a target of 65% of residential water being provided by desalinated water sources shall be set before shifting well water to agricultural usage.

(iv) Development Plan

Strategy WA-1 will be realized by implementing WA-2, WA-3 and WA-4. Therefore, this section does not discuss institutional and human capacity development plans, facility and infrastructure development plans, or financial and investment plans for increasing water for agriculture usage.

(b) WA-2: Increase of water for residential use

(i) Objective of the strategy

The objective of the strategy is to increase water for residential use by construction of the desalination plants, and improve water supply networks between major cities/towns.

(ii) Direct/Indirect Effect

The strategy will aim to have following direct and/or indirect effect on the local economy and social and environmental sustainability:

- 1) Connection of networks between major cities/towns
- 2) Increase of desalination plant employees
- 3) Conservation of natural water resources

(iii) Indicators

In order to measure the effect and impact of the strategy by the year 2025, a target of 65% of residential water being provided by desalinated water sources shall be set.

(iv) Development Plan

<Institutional and human capacity development plan>

SONEDE will be the core organization responsible for the water management of residential water usage. The staff in this organization will receive specific training and participate in international programs or exchange similar systems with other countries.

Short term (2015-2020):

- Necessary information will be collected and the structure will be created during this period.
- SONEDE and other key personnel's capacity building regarding water management are necessary.
- In addition, capacity development of desalination plant operation and transmission networks is necessary.

Mid-term (2020-2025):

- Suitable organization shall be established and operate with its own budget within SONEDE or another suitable managing ministry.

<Facility and infrastructure development plan>

For realizing this strategy, facilities and infrastructure should be developed through the below activities.

SONEDE's policy is as follows:

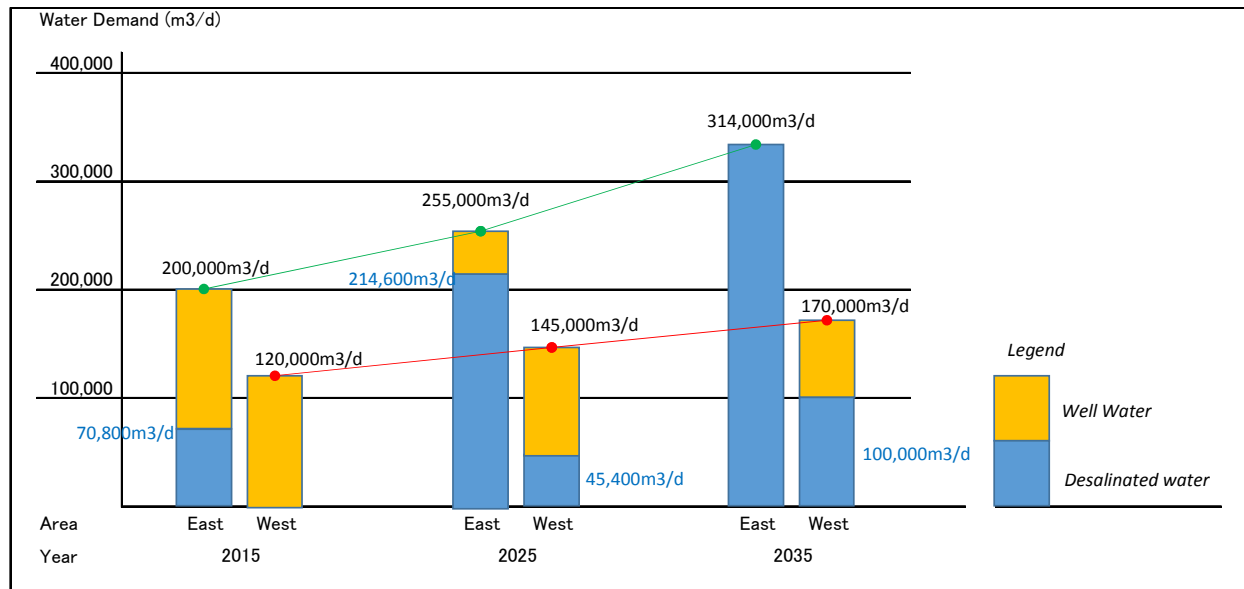
1. For the Southern Region, water supply will be shifted to desalination plants, and well water will be used for agriculture as mentioned in Section (a) WA-1: Increase of water for agricultural use, above.
2. Transmission pipelines will connect three governorates in the south-eastern region and water will be supplied from seawater and brackish water desalination plants.
3. Three governorates in the southwestern region will have a desalination plant in a suitable place for their towns. Connections among the governorates are not considered, because of its investment cost and benefit. The population in these areas is limited; therefore, independent desalination plants were concluded to be more economical.

Based on these policies, SONEDE has already begun work. Ten brackish water desalination plants and one seawater desalination plant in Djerba will be constructed by the end of 2016, and five additional brackish water desalination plants and one seawater desalination plant in Zarat will be constructed by the end of 2020, see Table 3.3-39.

Thus, in the southern region, construction of several desalination plants have already started, and by 2025, 214,000m³/day of fresh water will be produced in the eastern region and 45,400m³/day will be produced in the western region. Specific planning for the next 10 years (2026-2035) has not yet been announced by SONEDE, but JET estimated that a similar capacity of desalination plants would be constructed in this period. As a result, 100% of the eastern region's supply and 60% of the western region's supply will be provided by desalinated water sources.

As a result, water supply by source is summarized in Figure 3.3-24.

Ground well water supplied for residential usage will be reduced and will be used for emergency cases during peak demand, and the resulting excess of ground water will be shifted to agriculture usage during normal demand.



Source: SONEDE and JET

Figure 3.3-24 Water demand and supply source

The location of desalination plants and transmission pipelines are shown in Figure 3.3-25.

Since the southwest region does not face the sea, it is necessary to desalinate brackish groundwater, and waste discharge from the desalination plants has to be carefully handled, so as not to raise the salinity of the groundwater near the plans, also so as not to adversely affect the adjacent farmland. It is recommended to discharge the waste liquid into a Chott, in case the desalination plant is located near some Chott, or to drain to a pit with impervious walls for sun drying, in case the plant is far from any Chott.

Table 3.3-39 Desalination plant construction plan

		by SONEDE data											by JET						
		--2015			--2016			--2020			--2025			--2025 TOTAL	--2035			--2035 TOTAL	
		Plant	Governorate	(m3/d)	Plant	Governorate	(m3/d)	Plant	Governorate	(m3/d)	Plant	Governorate	(m3/d)	(m3/d)	Plant	Governorate	(m3/d)	(m3/d)	
East	SWRO				Djerba	Medenine	50,000	Zarat	Medenine	50,000	Djerba exp	Medenine	25,000		Zarat exp <i>New</i>	Medenine	50,000 <i>40,000</i>		
	SWRO Total			0			50,000			50,000			25,000	125,000			90,000	215,000	
	BWRO	Gabes	Gabes	34,000															
		Djerba	Medenine	20,000															
		Zarzis Ben Guerdane	Medenine Medenine	15,000 1,800	Beni Keda Matamata Mares	Medenine Gabes Gabes	800 4,000 5,000	Ben Guerd Medenine	9,000							<i>New 1</i> <i>New 2</i>	<i>Gabes</i> <i>Tataouine</i>	<i>5,000</i> <i>4,400</i>	
BWRO Total			70,800			9,800			9,000			0	89,600			9,400	99,000		
	Total			70,800			59,800			59,000			25,000	214,600			99,400	314,000	
West	BWRO				Tozeur	Tozeur	6,000	Degueche	Tozeur	2,000									
					Nafta	Tozeur	4,000												
					Hezoua	Tozeur	800												
					Kebili	Kebili	6,000	Kebili exp	Kebili	2,000									
					Souk Laha	Kebili	4,000												
					Douz	Kebili	4,000												
					Berkhir	Gafsa	1,600	Mdhila-Gu	Gafsa East	9,000									
								Metlaoui-F	Gafsa Wes	6,000									
	Total						26,400			19,000				45,400			<i>54,600</i>	100,000	
Grand Total(*)				70,800			86,200			78,000				260,000				414,000	

Blue figure: estimated by JET

(*)Grand Total capacity: discussed with SONEDE at Montfleu on 20.2.2015



Figure 3.3-25 Desalination plants and water transmission pipelines

For realizing this strategy, financial and investment plans, shall be created through the following activities:

Short term (2015-2020):

- Data collection and analysis of the current and future balance of water supply and demand, considering increase of the population and consumption per capita, and study necessary desalination plant and capacity of distribution network systems.
- Feasibility study for the water supply development by desalination plants.

Mid-term (2020-2025):

- Construction of seawater and/or brackish water desalination facilities
- Construction of effective distribution networks

<Financial and investment plan>

Construction cost estimations by SONEDE for the southern region are shown in Table 3.3-40. Based on these data, a 2000-m³/day brackish water desalination plant in Table 3.3-39 is estimated to cost around 10 million TND/unit, see Deguche and Kébili exp projects in Table 3.3-40.

In case of a 1000-m³/day desalination plant, estimated costs of 7-8 million TND are expected.

Table 3.3-40 Investment cost for the southern region

East	SWRO	2015					2016					2020				
		Plant	Governorate	(m ³ /d)	Cost (Contracted)		Plant	Governorate	(m ³ /d)	Cost (Contracted), incl. VAT		Plant	Governorate	(m ³ /d)	Cost (Budget) excl. VAT	
					Kilo TND	TND/m ³ /d				Kilo TND	TND/m ³ /d				Kilo TND	TND/m ³ /d
		Gabès	Gabès	34,000	90,000	Medenine	3,300	incl. Pipeline x60%(Desali)= 2,000m ³ /d	157,000	3,140	Zarat	Medenine	50,000	160,000	3,200	
		Zarzis	Medenine	15,000												
		Djerba	Medenine	12,000												
		Djerba exp 1	Medenine	3,000												
		Djerba exp 2	Medenine	5,000												
		Ben Guerdane	Medenine	1,800												
		Beni Khedache	Medenine	800	11,400	20,200	1,772	Ben Guerdane	Medenine	9,000	41,410	4,601				
		Matamata	Gabès	4,000												
		Mares	Gabès	5,000												
		Berkhir	Gafsa	1,600												
		Lot 1 Total														
West	BWRO	Tozeur	Tozeur	6,000	10,800	Kébili	6,000	Kébili exp	Kébili	2,000	9,013	4,507				
		Nafta	Tozeur	4,000												
		Hezoua	Tozeur	800												
				Lot 2 Total												
				Kébili	Kébili	6,000	14,000	16,100	1,150	Mdhila-Guettar	Gafsa East	9,000	37,880	4,209		
				Souk Lahad	Kébili	4,000										
				Douz	Kébili	4,000										
				Lot 3 Total												
				Berkhir	Gafsa	Included in above Lot 1				Mdhila-Guettar	Gafsa West	6,000	19,524	3,254		

Data source : SONEDE Tokyo Seminar 20-10-2014

For realizing this strategy, financial and investment plans, shall be created through the following activities:

Short term (2015-2020):

- In this stage, the Government of Tunisia shall prepare short-term and annual financial plans.
- If the cost exceeds the budget of the government, support by foreign donors shall be considered.

Mid-term (2020-2025):

- Establishment of long-term financial plans considering the government budget
- Funding by donors and PPP/concession schemes shall also be considered. This depends on the required cost.

(c) WA-3: Increase of water for industrial use

(i) Objective of the strategy

The objective of the strategy is to increase water for industrial use by construction of the desalination plants and improving wastewater treatment technology.

(ii) Direct/Indirect Effect

The strategy will aim to have following direct and/or indirect effect on the local economy and social and environmental sustainability:

- 1) Improvement of industrial water quality with desalination systems
- 2) Improvement of the WWTP processes and increase in the number of employees
- 3) Conservation of natural water resources

(iii) Indicators

In order to measure the effect and impact of the strategy by the year 2025, a target of 65% of residential water being provided by desalinated water sources shall be set and a target of 5% of industrial demand being supplied from the advanced wastewater treatment plant using the discharged water from ONAS's WWTPs shall be set.

(iv) Development Plan

<Institutional and human capacity development plan>

In this strategy, SONEDE and ONAS will be the core organizations responsible for the water management of water for industrial usage. Water supply and operation of desalination plants will be managed by SONEDE, and additional water treatment at WWTPs will be managed by SONEDE.

The staff in this organization will receive specific training and participate in international programs or exchange similar systems with other countries.

Short term (2015-2020):

- Necessary information will be collected and the structure will be created during this period.
- SONEDE, ONAS and other key personnel's capacity building regarding water management is necessary.
- In particular, capacity building of ONAS regarding wastewater recycling systems, and SONEDE regarding industrial water management is necessary.
- Review of regulations for re-use of treated wastewater

Mid-term (2020-2025):

- A suitable organization shall be established and operate with its own budget within SONEDE/ONAS or another suitable managing ministry.

<Facility and infrastructure development plan>

This has already been discussed in Section (b) WA-2, above.

For realizing this strategy, facilities and infrastructure should be developed through the following activities:

Short term (2015-2020):

- Data collection and analysis of the current and future balance of water supply and demand, considering the increased demand of industries in the future, and study necessary supply capacity and distribution network systems.
- Feasibility study for the water supply development by desalination plants and reuse of treated water from WWTPs, including their supply networks.

Mid-term (2020-2025):

- Construction of seawater and/or brackish water desalination facilities
- Construction of advanced wastewater treatment plants for producing suitable quality of water for industrial usage
- Construction of effective distribution networks

<Financial and investment plan>

For realizing this strategy, financial and investment plans, shall be created through the following activities:

Short term (2015-2020):

- In this stage, the Government of Tunisia shall prepare short-term and annual financial plans.
- If the cost exceeds the Government budget, support by foreign donors shall be considered.

Mid-term (2020-2025):

- Establishment of long-term financial plans considering the government budget.
- Funding by donors and PPP/concession schemes shall also be considered. This depends on the required cost.

(d) WA-4: Increase reuse of treated wastewater

(i) Objective of the strategy

The objective of the strategy is to improve wastewater treatment plants and their collection networks for better public sanitation and effective usage of water resources.

(ii) Direct/Indirect Effect

The strategy will aim to have following direct and/or indirect effect on the local economy and social and environmental sustainability:

- 1) Improvement of wastewater treatment level in order to meet the industrial water by advanced wastewater treatment system
- 2) Increase of connection rate with wastewater collection network
- 3) ONAS' capacity building

(iii) Indicators

In order to measure the effect and impact of the strategy by the year 2025, a target of 5% of industrial demand being supplied from the advanced wastewater treatment plant using the discharged water from ONAS's WWTPs shall be set.

Sewerage connection rate by the year 2035 shall be set as per Table 3.3-41 and Table 3.3-42.

(iv) Development Plan

<Institutional and human capacity development plan>

ONAS will be the core organization for water management for this strategy. The staff in this organization will receive specific training and participate in international programs or exchange similar systems with other countries.

Short term (2015-2020):

- Necessary information will be collected and the structure will be created during this period.
- ONAS and other key personnel's capacity building regarding water management are necessary.
- In particular, ONAS's capacity building regarding wastewater policy planning is necessary.

Mid-term (2020-2025):

- A suitable organization shall be established and operate with its own budget within ONAS or another suitable managing ministry.

<Facility and infrastructure development plan>

ONAS has an action plan for improving wastewater treatment facilities. The connection rate in the Southern Region will be improved as per Table 3.3-41 and Table 3.3-42.

Table 3.3-41 Projection of the connection rate in cities supported by ONAS

Governorate	2013	2015	2020	2025	2030	2035*
<i>Gabès</i>	90%	93,9%	98,1%	97,3%	98,2%	99,0%
<i>Mednine</i>	37%	40,5%	52,5%	59,2%	68,8%	77,0%
<i>Tataouine</i>	82%	83,5%	92,2%	95,0%	95,0%	95,0%
<i>Gafsa</i>	81%	88,1%	91,9%	94,3%	95,1%	95,0%
<i>Tozeur</i>	97%	98,7%	99,9%	99,5%	99,1%	99,5%
<i>Kébili</i>	82%	85,1%	99,5%	99,5%	99,6%	99,5%
All Tunisia	90,5%	91,8%	93,8%	94,9%	96,0%	

(* Estimated by JET)

Table 3.3-42 Projection of the connection rate in urban areas

Governorate	2013	2015	2020	2025	2030	2035*
<i>Gabès</i>	87%	90,4%	94,8%	96,6%	98,1%	99,0%
<i>Mednine</i>	31%	34,8%	52,2%	59,2%	68,8%	77,0%
<i>Tataouine</i>	65%	66,2%	75,2%	85,3%	95,0%	95,0%
<i>Gafsa</i>	71%	75,6%	91,9%	94,3%	95,1%	95,0%
<i>Tozeur</i>	88%	89,3%	90,4%	96,0%	99,1%	99,5%
<i>Kébili</i>	61%	63,1%	99,5%	99,5%	99,6%	99,5%
All Tunisia	85,9%	87,6%	92,1%	94,0%	96,0%	

(*) Estimated by JET

For this purpose, ONAS is currently implementing projects in various areas. Outlines of those projects are shown in Table 3.3-43 and Figure 3.3-26.

Table 3.3-43 Main program of projects in the southern governorates

Governorate	Project	Location	Outline	million TND
Gabès	1 Improve the Quality of treated water	El Hamma	Upgrading of WWTP	2.6
	2 New Network	No 23 catch'mt	75km, 4550 houses	7.5
	3 Upgrading of the existing ventilation systems	Gabès		6
	4 Rehabilitation of facility	Gabès & El Hamma	12km rehabilitation	4.3
	5 Improve of Sludge Management	all		-
Medeïneine	1 New WWTP	Djerba Ajim		4
	2 WWTP & Pipe network	Ben Guerdane	70km	24
	3 Improve the Quality of treated water	Medeïneine WWTP	Upgrading of WWTP 5 and rehabilitation of pumping station	0.3
		Zarzis, Souhill,...		12
	4 New Network (5th planning)	No 18 catch'mt	88km, 5000 houses	8.5
	5 Programme de Depollution de la Mediterranean Sea - DEPOLMED	Zarzis, Midoun and Ajim...	The extension of about 123km of pipelines and connection of about 3900 houses	15
		Djerba, Aghir...	Extension and rehabilitation of each WWTP	33
	6 Improve of Sludge Management	All	-	
	7 Study of Cogeneration	Djerba Aghir	-	
Tataouine	1 Sanitation	El maharajene		0.3
	2 New Network	No 3 catch'mt	10km, 500 houses	1
	3 New Network	Tataouine, & Ghomrassen	13km, 450 houses	1
	4 Improve of Sludge Management	all		-
	5 Upgrading	Tataouine STEP		5
Gafsa	1 Expansion & rehabilitation	Gafsa	19 WWTPs & 130 Pump station	29
	2 Sanitation	Guettar	WWTP & 25km pipe for 2800 houses	10
	3 Sanitation	10 mid size cities	Common STEP, 100km pipe for 8000 houses	30
	4 Sanitation	Mdhilla	WWTP, 20km pipe for 1500 houses	8
	5 Sanitation	12 cities	42km pipe for 3100 houses	4.5
	6 Improve of Sludge Management	all		-
Tozeur	1 Improvement	Hezoura	STEP, 18km pipe for 800 houses	4
	2 Sanitation	6citire	17km pipe for 740 houses	1.8
	3 Rehabilitation and extension of WWTP	Nafta		15
	4 Improve of Sludge Management	all		-
Kebili	1 Water environment improvement	Kebili, Douz ..	82km extension pipe for 6000 houses 10km rehabilitation pipe	13 2
	2 Improvement	Telmine	9km pipe for 465 houses	1.3
	3 Sanitation	4 cities	13km pipe for 1260 houses	1.7
	4 Sanitation	Souk Lahad	STEP, 35km pipe for 3000 houses	10
	5 Improve of Sludge Management	all		-

Data source: ONAS Tunis

WWTP: Waste Water Treatment Plant



Figure 3.3-26 ONAS's WWTP sites in the southern region

ONAS also has a policy for industrial wastewater. ONAS will collect wastewater, only when the quality of wastewater complies with effluent standards. In addition, if the quantity from the industries is more than 20% of ONAS's WWTP capacity, then that water will also not be collected. In such cases when ONAS does not collect wastewater, each factory will have to build their own WWTP in their factory, by their own account.

Details of factory locations and quantities have not been decided, therefore, detailed specification of required facilities cannot be discussed in this study.

In this regard, the following is a general idea for realizing this strategy, including reuse of treated wastewater. Facilities and infrastructure should be developed through the following activities.

Short term (2015-2020)

- Data collection and analysis of current, with consideration of the future of, collection pipeline networks.
- Feasibility study on the development of efficient wastewater collection pipeline networks, and rehabilitation of existing WWTPs and necessity of additional WWTPs.

Mid-term (2020-2025):

- Construction of effective wastewater collection pipeline networks
- Rehabilitation of existing wastewater treatment plants
- Construction of advanced wastewater treatment plants for producing suitable quality of water for industrial usage

<Financial and investment plan>

Cost information is discussed in Section 6.2.7 Construction Cost of Part I.

For realizing this strategy, financial and investment plans, shall be created through the following activities:

Short term (2015-2020):

- In this stage, the Government of Tunisia shall prepare short-term and annual financial plans.
- If the cost exceeds the Government budget, support by foreign donors shall be considered.

Mid-term (2020-2025):

- Establishment of long-term financial plans considering the government budget
- Funding by donors and PPP/concession schemes shall also be considered. This depends on the required cost.

Strategy		WA-1	Increase of water for agricultural use		
Sector	Plan		Actions	Term	Cost
Water	(a) Institutional and human capacity development plan		These are not independent, but will be realized by implementation of WA2, WA3 and WA4. Details are given in the project sheets, below.		
	(b) Facility and infrastructure development plan				
	(c) Financial and investment plan				

Strategy	WA-1	Increase of water for agricultural use		
Project	WA-1-1	Increase of water for agricultural use		
Intervention Area	-	Implementing agency	SONEDE, ONAS, Ministry of Agriculture	
Description				
<p>For agricultural water, underground water shall be used</p> <p>The objective of the strategy is to increase water for agricultural use by reducing the supply of underground water for residential and industrial usage.</p> <p>For this purpose, the following action plans are necessary. WA-2, WA-3 and WA-4 give details of the plans.</p>				
Action Plan				
Actions	Relevant organizations		Role	
<ul style="list-style-type: none"> - Construction of desalination plants and transmission pipelines for residential and industrial water. - Promotion of water reuse for industries from wastewater treatment plant by improving water quality. 	<ul style="list-style-type: none"> - SONEDE - ONAS 		<ul style="list-style-type: none"> - Study of best combination of seawater desalination and brackish water desalination plants - Suitable transmission pipelines will be also studied for the south-eastern region - In the southwestern region, inter-city transmission will not be considered due to its high cost - Promotion of water reuse 	
Indicator			Risk	
Proportion of desalinated water of the total residential and industrial demand (65% by 2025), and reused water from advanced wastewater treatment of the total industrial demand (5% by 2025).			Salinity of well water becomes worse, if deep well water is used for agriculture,	

Strategy		WA-2	Increase of water for residential use			
	Plan		Actions	Term	Cost	
Water	(a)	Institutional and human capacity development plan	WA-2-1: Study of a new organization and capacity building	<ul style="list-style-type: none"> - A New organization for the southern region will be studied, if necessary - SONEDE and other key personnel capacity building for water management is necessary - Capacity building of desalination plant operation and transmission network is necessary 	Short-Mid	—
	(b)	Facility and infrastructure development plan	WA-2-2: Facility design and construction	<ul style="list-style-type: none"> - Study of water balance projections for the future. - Feasibility study of desalination plants - Construction of seawater and/or brackish water desalination facilities - Construction of transmission network 	Short - Mid	18 million TND
	(c)	Financial and investment plan	WA-2-3: Financing and investment	<ul style="list-style-type: none"> - If costs exceed the Government budget, support by foreign donors shall be considered - Establishment of long-term financial plans considering the Government budget - Study of the possibility of funding by foreign donors - Study of PPP/concession schemes 	Short - Mid	—

Strategy	WA-2	Increase of water for residential use	
Project	WA-2-1	New organization and capacity building	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>According to SONEDE, desalination technology has been adopted to increase water available for residential use. Especially in the south-eastern region (Gabès, Medenine, and Tataouine), seawater desalination and brackish water desalination plants will produce the required amount of water and transfer it to consumers by pipeline.</p> <p>In the southwestern region (Gafsa, Kébili, Tozeur), brackish water desalination plants will be constructed where needed. Transmission pipelines will not be planned due to their high cost.</p> <p>For this purpose, a new organization will be studied, if necessary, and capacity building is recommended.</p>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Study of a new organization for management of residential water, if necessary - Capacity building for operation of desalination plant 	<ul style="list-style-type: none"> - SONEDE - ONAS - Ministry of Agriculture, Water Resources and Fisheries - Ministry of Interior 	<ul style="list-style-type: none"> - Capacity building of SONEDE and other key personnel for water management. - Capacity building of desalination plant operation and transmission network - If necessary, a new organization for the southern region will be set up 	
Indicator		Risk	
-		- Quality and stability of water supply becomes better , but tariffs may increase	

Strategy	WA-2	Increase of water for residential use	
Project	WA-2-2	Facility design and construction	
Intervention Area	-	Implementing agency	SONEDE
Description			
<p>According to SONEDE, desalination technology has been adopted to increase the water available for residential use. Especially in the south-eastern region (Gabès, Medenine, and Tataouine), seawater desalination and brackish water desalination plants will produce the required amount of water and transfer it to consumers by pipeline.</p> <p>In the southwestern region (Gafsa, Kébili, Tozeur), brackish water desalination plants will be constructed where needed. Transmission pipelines will not be planned due to their high cost.</p> <p>For this purpose, specification of new facilities will be studied and constructed.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Construction of desalination plant and transmission pipeline network	- SONEDE - Ministry of Agriculture, Water Resources and Fisheries	<ul style="list-style-type: none"> - Data collection and analysis of current and projected water balance, considering the population increase and consumption increase per capita in the future, and study necessary desalination plant capacity and distribution network system - Study of the development of water supply based on desalination plant water sources - Study of best combination of seawater desalination and brackish water desalination plants - Construction of seawater and/or brackish water desalination facilities - Construction of effective transmission networks - Suitable transmission pipelines will be also studied for the south-eastern region - In southwestern region, inter-city transmission will not be considered due to its high cost. 	
Indicator		Risk	
- Proportion of desalinated water of the total residential and industrial demand (65% by 2025)		- Quality and stability of water supply becomes better, but tariffs may increase.	

Strategy	WA-2	Increase of water for residential use	
Project	WA-2-3	Financing and Investment	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>According to SONEDE, desalination technology has been adopted to increase the water available for residential use. Especially in the south-eastern region (Gabès, Medenine, and Tataouine), seawater desalination and brackish water desalination plants will produce the required amount of water and transfer it to consumers by pipeline.</p> <p>In the southwestern region (Gafsa, Kébili, Tozeur), brackish water desalination plants will be constructed where needed. Transmission pipelines will not be planned due to their high cost.</p> <p>For this purpose, financing and investment strategies will be studied and executed.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Mobilize the budget for improvement of water supply	- SONEDE - Ministry of Agriculture, Water Resources and Fisheries	<ul style="list-style-type: none"> - In this stage, the Government of Tunisia shall prepare short-term and annual financial plans - If costs exceed the Government budget, support by foreign donors shall be considered - Establishment of long-term financial plans considering the Government budget - Funding by foreign donors and PPP/concession schemes are also a possibility. This depends on the costs involved 	
Indicator		Risk	
-		- Balance of amount of loan and Government budget.	

Strategy		WA-3	Increase of water for industrial use		
	Plan		Actions	Term	Cost
Water	(a) Institutional and human capacity development plan	WA-3-1: Study of a new organization and capacity building	<ul style="list-style-type: none"> - Study of a new organization for the southern region, if necessary - SONEDE ONAS and other key personnel capacity building for water management. - Capacity building of desalination plant operation and transmission network - Capacity building of ONAS to develop wastewater recycling systems - Review of regulations for re-use of treated wastewater 	Short -Mid	—
	(b) Facility and infrastructure development plan	WA-3-2: Facility design and construction	<ul style="list-style-type: none"> - Study of projected water balance for the future based on increased desalination plants and use of treated water from WWTP (Wastewater treatment plant) - Construction of seawater and/or brackish water desalination facilities - Construction of advanced wastewater treatment plants for producing suitable quality of water for industrial usage - Construction of transmission network 	Short - Mid	Included in WA-2
	(c) Financial and investment plan	WA-3-3: Financing and investment	<ul style="list-style-type: none"> - If costs exceed the Government budget, support by foreign donors shall be considered - Establishment of long-term financial plans considering the Government budget - Study of the possibility of funding by foreign donors - Study PPP/concession schemes 	Short - Mid	—

Strategy	WA-3	Increase of water for industrial use	
Project	WA-3-1	New organization and capacity building	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>According to SONEDE, desalination technology has been adopted to increase the amount of water available for residential use. Especially, in the south-eastern region (Gabès, Medenine, and Tataouine), seawater desalination and brackish water desalination plants will produce the required amount of water and transfer it to consumers by pipeline.</p> <p>In the southwestern region (Gafsa, Kébili, Tozeur), brackish water desalination plants will be constructed where needed. Transmission pipelines will not be planned due to their high cost.</p> <p>In addition, by adopting new technology in WA-4, treated wastewater for industrial use will be increased. For this purpose, a new organization will be studied if necessary, and capacity building is recommended.</p>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Study of a new organization for management of residential water, if necessary - Capacity building for operation of desalination plant 	<ul style="list-style-type: none"> - SONEDE - ONAS - Ministry of Agriculture, Water Resources and Fisheries - Ministry of Interior 	<ul style="list-style-type: none"> - Capacity building of SONEDE, ONAS and other key personnel for water management. - Capacity building of ONAS to develop wastewater recycling systems for industrial water - Capacity building of desalination plant operation and transmission network - If necessary, a new organization for the southern region will be set up 	
Indicator		Risk	
-		- Quality and stability of water supply becomes better, but tariffs may increase.	

Strategy	WA-3	Increase of water for industrial use	
Project	WA-3-2	Facility design and construction	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>According to SONEDE, desalination technology has been adopted to increase the amount of water available for residential use. Especially in the south-eastern region (Gabès, Medenine, and Tataouine), seawater desalination and brackish water desalination plants will produce necessary water and transfer to consumers by pipeline.</p> <p>In the southwestern region (Gafsa, Kébili, Tozeur), brackish water desalination plants will be constructed at use points. Transmission pipelines will not be planned due to their high cost.</p> <p>In addition, by adopting new technology in WA-4, treated wastewater for industrial use will be increased. For this purpose, specification of new facilities will be studied and constructed.</p>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Construction of desalination plant and transmission pipeline network - Construction of advanced wastewater treatment plant 	<ul style="list-style-type: none"> - SONEDE - Min. of Agriculture, Water Resources and Fisheries - ONAS - Ministry of Interior 	<ul style="list-style-type: none"> - Data collection and analyse of current and projected water balance, considering population growth and consumption increase per capita in the future, and study necessary desalination plant capacity and distribution network system. - Study on the development of water supply based on desalination plant and reused wastewater. - Study of best combination of seawater desalination and brackish water desalination plants, and reused water. - Construction of seawater and/or brackish water desalination facilities - Construction of advanced wastewater treatment plants for producing suitable quality of water for industrial usage - Construction of effective transmission network - Suitable transmission pipeline will be also studied for the south-eastern region - In the southwestern region, inter-city transmission will not be considered due to its high cost. 	
Indicator		Risk	
<ul style="list-style-type: none"> - Proportion of desalinated water of the total residential and industrial demand (65% by 2025), and reused water from advanced wastewater treatment of the total industrial demand (5% by 2025). 		<ul style="list-style-type: none"> - Quality and stability of water supply becomes better, but tariffs may increase. 	

Strategy	WA-3	Increase of water for industrial use	
Project	WA-3-3	Financing and Investment	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>According to SONEDE, desalination technology has been adopted to increase the amount of water available for residential use. Especially in the south-eastern region (Gabès, Medenine, and Tataouine), seawater desalination and brackish water desalination plants will produce the required amount of water and transfer it to consumers by pipeline.</p> <p>In the southwestern region (Gafsa, Kébili, Tozeur), brackish water desalination plants will be constructed at use points. Transmission pipelines will not be planned due to their high cost.</p> <p>In addition, by adopting new technology in WA-4, treated wastewater for industrial use will be increased. For this purpose, financing and investment strategies will be studied and executed.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Mobilize the budget for improvement of water supply	- SONEDE - Ministry of Agriculture, Water Resources and Fisheries	<ul style="list-style-type: none"> - In this stage, the Government of Tunisia shall prepare short-term and annual financial plans. - If costs exceed the Government budget, support by foreign donors shall be considered - Establishment of long-term financial plans considering the Government budget - The fund by foreign countries donors and PPP/concession scheme are also a possibility. This depends on of the costs incurred 	
Indicator		Risk	
-		- Balance of amount of loan and Government budget.	

Strategy		WA-4	Increase reuse of treated wastewater			
	Plan		Actions	Term	Cost	
Water	(a)	Institutional and human capacity development plan	WA-4-1: Study of a new organization and capacity building	<ul style="list-style-type: none"> - Study of a new organization for the southern region, if necessary. - ONAS and other key personnel capacity building for water management - Capacity building of ONAS to develop wastewater recycling systems - Review of regulation for re-use of treated wastewater 	Short -Mid	—
	(b)	Facility and infrastructure development plan	WA-4-2: Facility design and construction	<ul style="list-style-type: none"> - Feasibility study on the development of efficient wastewater collection network, and rehabilitation of existing WWTP and necessity of additional WWTP. - Construction of effective wastewater collection network - Rehabilitation of existing wastewater treatment plants - Construction of advanced wastewater treatment plants for producing suitable quality of water for industrial usage 	Short - Mid	33 million TND for advanced wastewater reuse plants. Other costs are given in Table 3.3-43
	(c)	Financial and investment plan	WA-4-3: Financing and investment	<ul style="list-style-type: none"> - If costs exceed the Government budget, support by foreign donors shall be considered - Establishment of long-term financial plans considering the Government budget - Study of the possibility of funding by foreign donors - Study PPP/concession 	Short - Mid	—

Strategy	WA-4	Increase reuse of treated wastewater	
Project	WA-4-1	New organization and capacity building	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>ONAS makes efforts to improve the connection rate to sewerage (effluent collection pipelines), and build new wastewater treatment plant (WWTP) in suitable places, and improve facilities of WWTP for better-treated water quality.</p> <p>Current quality of treated wastewater is not sufficient for industrial usage. Therefore, by adding further treatment processes to conventional processes, the quality of treated water can be improved to meet the requirements for industrial usage.</p> <p>This project aims to increase and improve treated wastewater to meet the required quality for industrial usage, and as a result, increase of water for industrial use.</p> <p>For this purpose, a new organization will be studied if necessary, and capacity building is recommended.</p>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Study of a new organization for management of residential water, if necessary. - Capacity building for operation of desalination plant 	<ul style="list-style-type: none"> - ONAS - Ministry of Interior 	<ul style="list-style-type: none"> - Capacity building to ONAS and other key personnel for water management. - Capacity building of ONAS to develop wastewater-recycling systems for industrial water management is necessary. - Review of regulation for re-use of treated wastewater - If necessary, a new organization for the southern region will be set up 	
Indicator		Risk	
-		<ul style="list-style-type: none"> - Quality and stability of water supply becomes better, but tariffs may increase. 	

Strategy	WA-4	Increase reuse of treated wastewater	
Project	WA-4-2	Facility design and construction	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>ONAS makes efforts to improve connection ratio with sewerage (effluent collection pipelines), and build new wastewater treatment plant (WWTP) at suitable places, and improve facilities of WWTP for better-treated water quality.</p> <p>Current quality of treated wastewater is not sufficient for industrial usage. Therefore, by adding further treatment processes to conventional processes, the quality of treated water can be improved to meet the requirements for industrial usage.</p> <p>This project aims to increase and improve treated wastewater for to meet the required quality for industrial usage, and as a result, increase of water for industrial use.</p> <p>For this purpose, specification of new facilities will be studied and constructed.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Construction of advanced wastewater treatment plant	- ONAS - Ministry of Interior	<ul style="list-style-type: none"> - Data collection and analysis of current and projected collection network, considering population growth. - Study of development of efficient wastewater collection network, and rehabilitation of existing WWTP and necessity of additional WWTP - Construction of effective wastewater collection network - Construction of advanced wastewater treatment plants for producing suitable quality of water for industrial usage 	
Indicator		Risk	
- Proportion of reused water from advanced wastewater treatment of the total industrial demand (5% by 2025)		- Quality and stability of water supply becomes better, but tariffs may increase.	

Strategy	WA-4	Increase reuse of treated wastewater	
Project	WA-4-3	Financing and Investment	
Intervention Area	-	Implementing agency	SONEDE, ONAS
Description			
<p>ONAS makes efforts to improve connection ratio with sewerage (effluent collection pipelines), and build new wastewater treatment plant (WWTP) at suitable places, and improve facilities of WWTP for better-treated water quality.</p> <p>Current quality of treated wastewater is not sufficient for industrial usage. Therefore, by adding further treatment processes to conventional processes, the quality of treated water can be improved to meet the requirements for industrial usage.</p> <p>This project aims to increase and improve treated wastewater to meet the required quality for industrial usage, and as a result, increase of water for industrial use.</p> <p>For this purpose, financing and investment strategies will be studied and executed.</p>			
Action Plan			
Actions	Relevant organizations	Role	
- Mobilize the budget for improvement of water supply	- ONAS - Min. of Interior	<ul style="list-style-type: none"> - In this stage, the Government of Tunisia shall prepare short-term and annual financial plans - If costs exceed the Government budget, support by foreign donors shall be considered - Establishment of long-term financial plans considering the Government budget - Funding by foreign donors and PPP/concession schemes are also a possibility. This depends on the cost incurred 	
Indicator		Risk	
-		- Balance of amount of loan and Government budget.	

3.3.3 Power supply

(1) Summary of current situation

(a) Current situation

The power supply in Tunisia has satisfied its current demand, and the electrification rate in 2012 was 99.6%. The power generated at the plant equipment is transmitted to each area of the country by the ultra-high voltage power line, and it is lowered from ultra-high voltage into high voltage in the substation of each area, and electricity is transmitted to each consumer in the area through the local power line.

The current condition of power supply consumption in the southern region is as follows: 43% by households, 54% by industries, and 3% by others.

In the southern region, the substation and the electricity grid have been managed by the district of each area. The amount of consumption in the area is currently within the capacity of the substation. However, it seems that the demand will exceed the supply capacity in the near future since the demand continues increasing.

(b) Current issue

From current situation, the following issues are considered:

- The existing supply capacity will not be able to satisfy if the demand continues to grow by 4% annually; thus the additional plant should be built.
- Since the current power generation is based on natural gas, there is environmental impact concern.

To deal with these issues, the following works are required:

- It is necessary to predict the future demand, and take necessary measures.
- Estimate the additional capacity needed in a southern region, and examine whether the measure against which level is effective, and draw up a strategy.

(2) Demand Forecast

Generally, there are three major indicators for comprehending demands for electric power.

- Power consumption
- Peak power demand
- Capacity of power plants

Equipment to be installed, and operation and management of the power sector can be examined after estimating these indicators. The demand forecast is conducted in the following two steps:

- 1) Estimation of the demand for electricity in the whole country
- 2) Estimation of the demand for electricity in the Southern Region

(a) Estimation Method

The demand is estimated utilizing the following data:

- Population data (1995–2013)

- Population data of the Southern Region (2012)
- Forecast data of the power consumption, the electric power production, and the power demand load peak (2001–2026: STEG data and forecast)
- Population forecast (2025, 2035)
- Population forecast of the Southern Region (2025, 2035)

The Estimation is carried out in the following procedure:

- 1) A relational equation (Model) between population and power consumption is created by regression analysis.
- 2) Applying population of 2025–2035 estimated by JET
- 3) Power consumption by 2035 is estimated by using the projected population as an input into the model.

Simultaneously, necessary capacities of power plants and peak power demand are estimated from the electric power consumption through the following method:

- 1) Concerning capacities of peak power demand and power consumption, average ratio is calculated from recorded data.
- 2) Values of capacity of the peak power demand load are forecasted from the estimated forecast values of power consumption based on the average ratio.
- 3) Ratio of peak power demand to capacity of power plants in 2013 is calculated.
- 4) Capacity of power plants required by 2035 is calculated from the ratio

Estimation of power demand in the Southern Region is carried out in the following procedures:

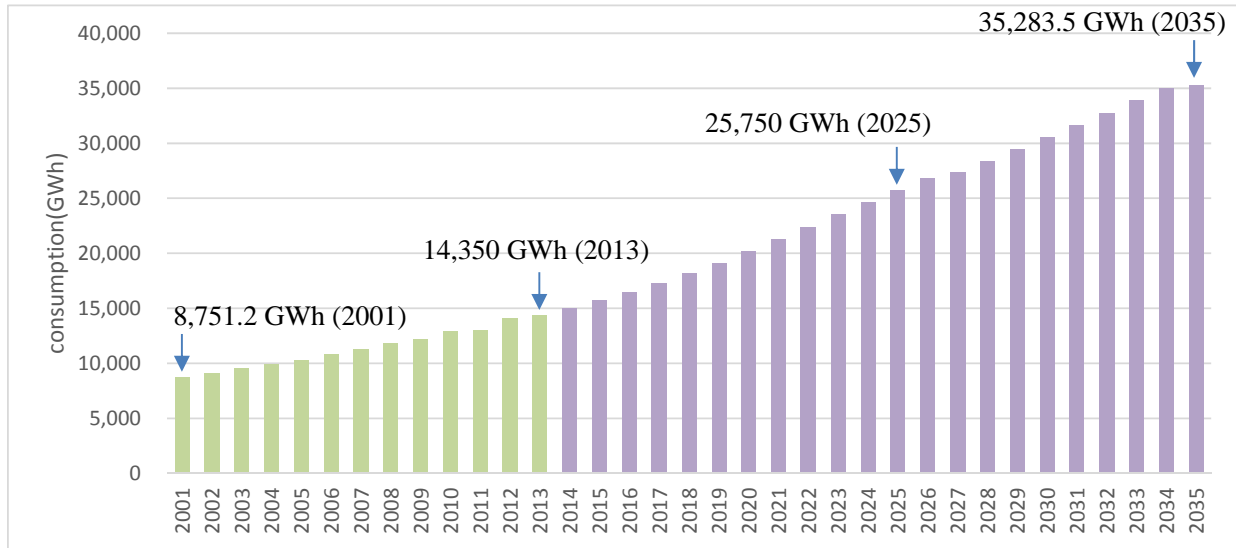
- 1) Data of power consumption, peak power demand and capacity of substation in the Southern Region in 2012 are created based on known information (STEG data, chiffres:ODS).
- 2) National power consumption is divided into that of each governorate of the Southern Region with the proportion of population.
- 3) A correction coefficient is calculated using the above-mentioned results and demand data of the Southern Region in 2012.
- 4) Values of power consumption of the Southern Region in 2025 and 2035 are divided by the proportion of estimated population.
- 5) Peak power demand and capacity of substation the Southern Region in 2025 and 2035 are estimated by multiplying the power consumption by a correction coefficient.

(b) Result of Estimation

The estimations are conducted with the following assumptions and conditions:

- The relation between the population data and the power consumption is a quadratic function.
- The interpolation of the population data is calculated by alignment approximation.
- The average ratio of the power consumption to the peak power demand is 51.6%.
- The ratio of the peak power demand to the capacity of the total power plants is 70.14% based on the 2013 record.

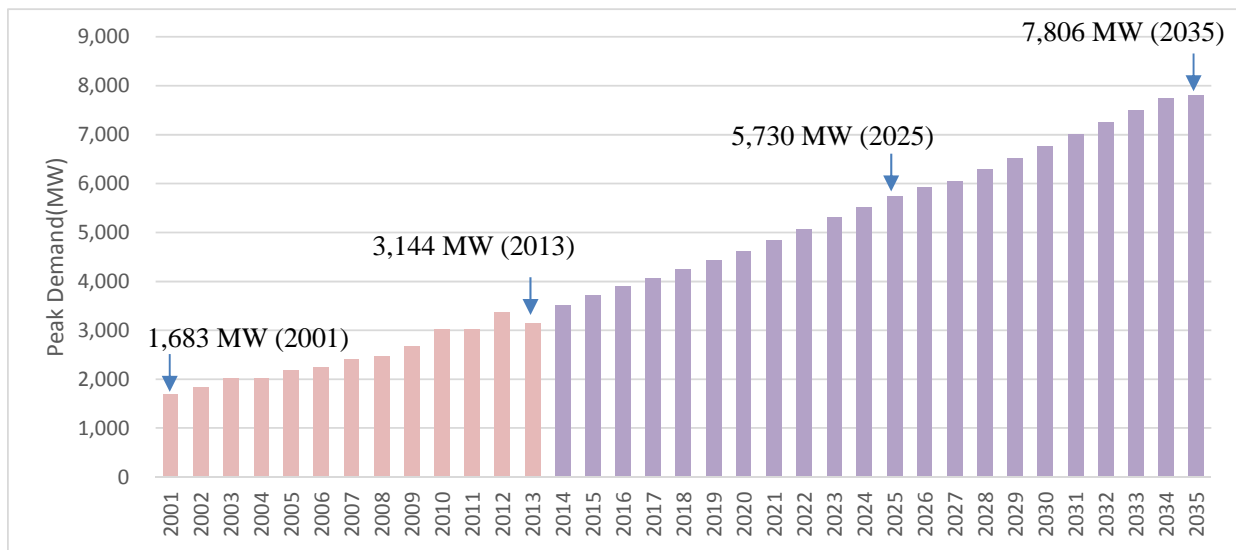
Estimated result of the power consumption of Tunisia is shown below. The consumption was 14,350 GWh in 2013. This is expected to increase to 25,750 GWh in 2025, and to 35,283.5 GWh in 2035.



Source: JET

Figure 3.3-27 Estimation Result of the Power Consumption

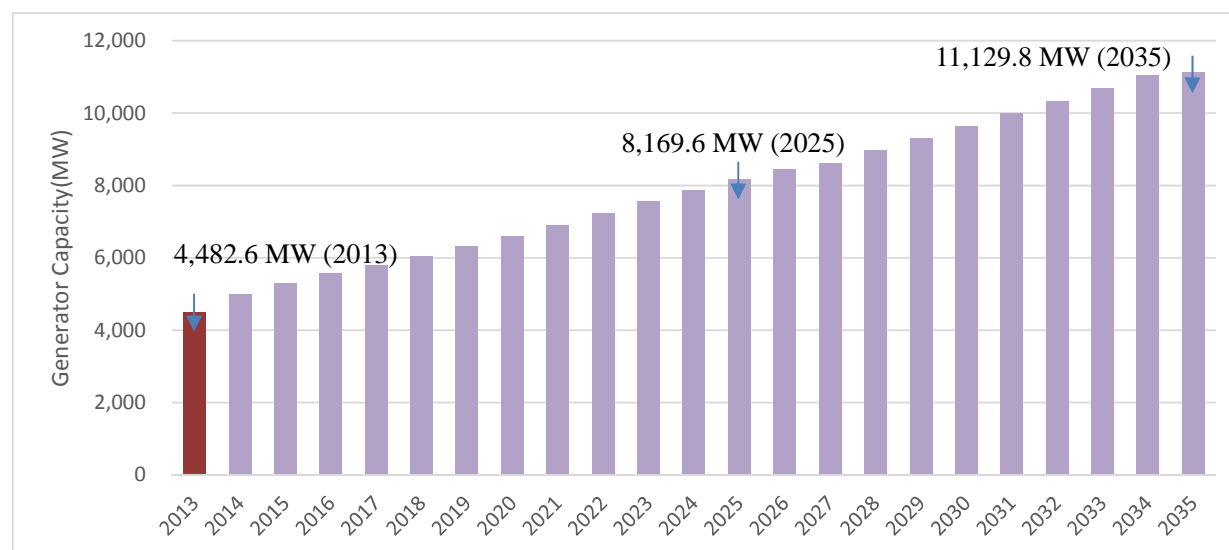
The following graph indicates estimated result of the peak power demand of Tunisia. It was 3,144 MW in 2013, and it will be expected to increase to 5,730 MW in 2025, and to 7,806 MW in 2035.



Source: JET

Figure 3.3-28 Estimation Result of the Power Demand Load Peak

Estimated result of necessary capacity of the power plants is shown in the following figure. It was 4,482.6 MW in 2013, and it will be expected to increase to 8,169.6 MW in 2025, and to 11,129.8 MW in 2035.



Source: JET

Figure 3.3-29 Estimation Result of the Necessary Capacity of the Power Plant

Results of the estimation of the future power supply are summarised as follows:

- Compared with the 2013 value, the power consumption will increase by 1.79 times in 2025, and by 2.46 times in 2035.
- Compared with the 2013 value, the power plant capacity will increase by 1.82 times in 2025, and by 2.48 times in 2035.

Power demand of the Southern Region is estimated assuming the following conditions with the estimated results of the whole country:

- The recorded power consumption of the Southern Region is as in Table 3.3-.
- In order to estimate power consumption, substitute the average value for the place without data.

Table 3.3-44 Power supply in the Southern Region in 2012

	Power consumption	Load Peak	Substation capacity
	(GWh)	(MW)	(MW)
Gafsa	296.0	*0.0	80
Gabès	229.7	209.6	260
Kébili	120.0	50.0	80
Médenine	598.8	169.5	360
Tataouine	111.6	39.4	80
Tozeur	105.3	60.0	80

*The load peak data of Gafsa has not been acquired yet.

Source: JET

Table 3.3-45 Estimates of future power supply of the Southern Region

		Power consumption			Load Peak			Insufficiency of substation capacity (compare with peak load)		
		(GWh)			(MW)			(MW)		
		2012	2025	2035	2012	2025	2035	2012	2025	2035
Gafsa	Quantity	296.0	544.9	746.7	0.0	234.7	321.6	-	-154.7	-241.6
	Ratio	1.00	1.84	2.52	-	-	-	-	-	-
Gabès	Quantity	229.7	419.8	575.2	209.6	383.4	525.3	50.4	-123.4	-265.3
	Ratio	1.00	1.83	2.50	1.00	1.83	2.51	-	-	-
Kébili	Quantity	120.0	221.4	303.3	50.0	92.2	126.4	30.0	-12.2	-46.4
	Ratio	1.00	1.84	2.53	1.00	1.84	2.53	-	-	-
Médenine	Quantity	598.8	1104.7	1513.7	169.5	312.9	428.8	190.5	47.1	-68.8
	Ratio	1.00	1.85	2.53	1.00	1.85	2.53	-	-	-
Tataouine	Quantity	111.6	203.7	279.1	39.4	72.0	98.6	40.6	8.0	-18.6
	Ratio	1.00	1.82	2.50	1.00	1.83	2.50	-	-	-
Tozeur	Quantity	105.3	196.3	269.0	60.0	112.0	153.5	20.0	-32.0	-73.5
	Ratio	1.00	1.86	2.55	1.00	1.87	2.56	-	-	-

Source: JET

Results of the estimation of the future power supply are summarised below:

- Compared with 2012 value, the power consumption will increase by 1.82–1.86 times in 2025, and by 2.50–2.55 times in 2035.
- Compared with the 2012 value, the peak demand will increase by 1.83–1.87 times in 2025, and by 2.50–2.56 times in 2035.
- Capacity of the substations installed to correspond to the current peak power demands. However, the capacity of a substation will run short in four governorates in 2025, and six in 2035.
- The capacity which runs short in 2025 will be 154.7 MW in Gafsa, 123.4MW in Gabès, 12.2 MW in Tozeur, 32MW in Kébili.
- The capacity which runs short in 2035 will be 241.6 MW in Gafsa, 265.3MW in Gabès, 46.4 MW in Kébili, 68.8 MW in Médenine, 18.6 MW in Tataouine, 73.5 MW in Tozeur.

(3) Strategies and Plans

The estimated results show that the power supply will not meet the future demand. To deal with this issue, three strategies are proposed as follows:

Table 3.3-46 Strategies on Power Supply in the Southern Region

Code	Strategy	Effect (Direct / Indirect)			Indicator
		Value-added	Job creation	Sustainability	
PS-1	Reduction of the Power Demand Load Peak through the Demand Control	Investment may be assigned to improve the quality of power.	Employment is created by the new type of industry, DRA.	Amount of consumption of fossil fuel reduces.	<ul style="list-style-type: none"> • Plant operation ratio will decrease to 00.0% by the year 2035. • Capacity of generation plant will be improved to 00.0% by the year 2035. • Subscribers of Demand Response

					will be increased to 0000 by the year 2035.
PS-2	Increase the Amount of Available Energy by Reducing the ratio of Power Distribution Loss	Economic efficiency of the power industry improves.	Employment for equipment replacement is created.	Amount of consumption of fossil fuel reduces.	• Electric power distribution loss rate will be decreased to 00.0% by the year 2035
PS-3	Infrastructure Development in line with the Scenario of the Development Plan	Contribution is made to promote industries in the Southern Region.			• Installation capacity for the electricity infrastructure will be xxx MW in future.
PS-4	Introducing Renewable Energy for Base Power and Peak Power Response	Green power spreads.	Employment for construction and maintenance of the equipment is created	Amount of consumption of fossil fuel reduces.	• Renewable energy supply rate will be decreased to 00.0% by the year 2035.

Source: JET

(a) PS-1: Reduction of the Power Demand Load Peak through the Demand Control

(i) Objective of the Strategy

The power supply system in the society should be transformed from the current system in which the power supplier generates electricity according to the demand to a system in which the power demand will be controlled to reduce the peak load. The new system used technology called “Demand Response (DR),” which is useful to reduce the power demand asking consumers to reduce their power usage during the peak load hour to maintain that the total power usage under the power supply capacity limit.

(ii) Direct/Indirect Effects

This strategy will bear the following direct and indirect effects:

- DR will be beneficial in large and positive effect through accepting both large and small power consumers.
- The power suppliers will be able to manage their supply through current capacity of the power generating facilities, so that it will not be necessary to invest large amount of money in new plant development.
- As multiple DR will be integrated to form a new service called “Demand Response Aggregator (DRA)” which will take a major role in the power supply and management business controlling the demand in cooperation with the power suppliers.
- It is expected that the fossil fuel consumption for the power generation will reduce.
- The number of the employment will increase because of the DRA.
- By assigning the investments to the amelioration of equipment instead of new plant constructions, the quality improvement of the electric power is expected.

(iii) Indicators

The following indicators are set to monitor results of implementation of the strategy:

- Reduction of the plant operating ratio during the peak hour
- Reduction rate from the estimated plant capacity and substation capacity

- Number of DR subscribers

(iv) Development Plan

< PS-1-1: Institutional Design of the Demand Response Project >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- The supervising ministry will conduct surveys and institutional design for the demand response project.
- The supervising ministry will establish an organization to supervise the screening of the project.
- The supervising ministry will establish an organization to lead the project operator.

< PS-1-2: Consideration of Project Feasibility and Planning >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- The electricity company will establish a demand response organization.
- The electricity company will survey the effects of demand response and incentives to DRA.
- The supervising ministry will draw a plan for the project to demonstrate demand response.

< PS-1-3: Demonstration Project for Actual Introduction >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015–2025):

- The private business will establish a project company for DRA.

Mid-term (2020–2025):

- The supervising ministry will implement the demonstration project for DRA.

(b) PS-2: Increase the amount of available energy by reducing the ratio of power distribution loss

(i) Objective of the Strategy

Approximately 15% of generated electricity is lost in the power distribution. Reducing the distribution loss will have positively impact on the economy of power operation with more available power supply.

(ii) Direct/Indirect Effects

The following direct and indirect effects will be generated by the implementation of the strategy:

- Amount of power generated will be reduced according to the usage.
- Amount of fossil fuel consumption will be reduced.
- Number of employment will increase based on the system/facility replacement and upgrade.

(iii) Indicators

The following indicator is set to monitor the result of implementation of the strategy:

- Reduction of the power distribution loss

(iv) Development Plan

< PS-2-1: Survey on the Current Situation and Consideration of Measures >

The plan will be realized through implementing the following actions:

Short term (2015--2020):

- The electricity company will establish an organization to conduct survey and consider measures for power distribution loss.
- The electricity company will conduct survey to find causes of the current power distribution loss.
- The electricity company will redesign power transmission and distribution based on the survey results.

< PS-2-2: Efforts to implement the Design into Execution >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- The electricity company will formulate an execution plan based on the redesign.

Mid-term (2020–2025):

- The electricity company will procure fund based on the project plan.
- The electricity company will implement the plan into execution.

(c) **PS-3: Infrastructure Development in line with the Scenario of the Development Plan**

(i) **Objective of the Strategy**

This survey formulates a development plan scenario of the southern region. There is a development of the industrial park with the installation of the infrastructure in the power infrastructure is also necessary to consider the installation. Infrastructure demand to be set in the plan and estimate the capacity of the infrastructure to be insufficient based on the future and will be discussed to quickly transition to development.

(ii) **Direct/Indirect Effects**

The strategy will generate the following direct and indirect effects:

- It will identify the power capacity required for development.
- It makes possible to know the amount of power supply gap in each region in the future.

(iii) **Indicators**

The following are set as indicators to monitor the result:

- Predicted value of regional power demand
- Development plan value of regional power infrastructure
- Capacity of power infrastructure in the future

(iv) **Development Plan**

< PS-3-1: Reflection of Future Forecast in the Plan >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- Future demand and future forecasting of installation
- Creation of development scenario
- Calculation of the necessary infrastructure capacity based on the future forecast and scenario

< PS-3-2: Implementation of the Plan >

The plan will be realized through implementing the following actions:

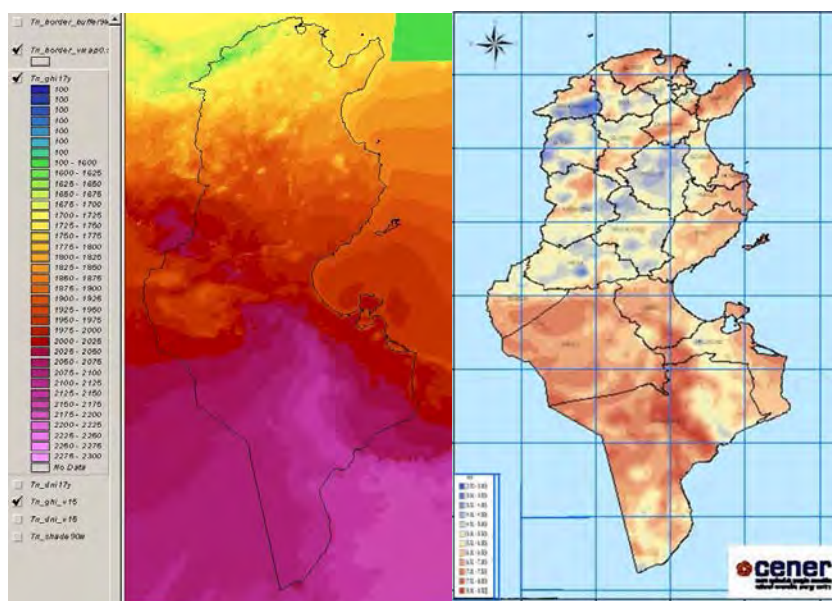
Short- to Mid-term (2015–2025):

- A plan for introduction will be formulated based on the necessary infrastructure capacity.
- The introduction will be implemented in accordance with the plan.

(d) PS-4: Introducing renewable energy for base power and peak power response

(i) Objective of the Strategy

According to the total regional power demand, the investment has been made to install power generators and substations. Therefore, there are some power generation facilities in standby mode during the off-peak hours. To address this problem, it is necessary to improve the operation rate of the equipment by introducing the renewable energy that supplements the demand at the peak time.



Source: STEG-ER

Figure 3.3-30 Potential Map of Renewable Energy

(Left: Solar radiation, Right: Wind power)

(ii) Direct/Indirect Effects

The strategy will generate the following direct and indirect effects:

- Construction of new substations will decrease.
- Volume of fossil fuel consumption for power generation will be reduced.
- New employment for construction and maintenance of the equipment for renewable power generation will be created.

(iii) Indicators

The following is set as an indicator to monitor the result:

- Supply rate of renewable energy capacity for the peak demand

(iv) Development Plan

< PS-4-1: Overall Goal and Feasibility Study, and Formulation of a Plan based on Demand Forecast >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- Surveying the volume of renewable energy that can be introduced
- Forecasting the electricity demand in each area

Mid-term (2020–2025):

- Planning the introduction in consideration of the survey results and overall goal

< PS-4-2: Improvement of Support Systems for Implementation of the Plan >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015–2025):

- Support systems for implementation of the plan will be established.
- The project will be executed according to the plan.

(4) Action plans

Action plans are summarized in action plan sheets shown on the next page.

Sector	Strategy	PS-1	Reduction of the Power Demand Load Peak through the Demand Control		
	Plan		Actions	Term	Cost
Power Supply	PS-1-1: Institutional Design of the Demand Response Project		<ul style="list-style-type: none"> - The supervising ministry will conduct surveys and institutional design for the demand response project. - The supervising ministry will establish an organization to supervise the screening of the project. - The supervising ministry will establish an organization to lead the project operator. 	Short	3,000,000 TND
	PS-1-2: Consideration of Project Feasibility and Planning		<ul style="list-style-type: none"> - The electricity company will establish a demand response organization. - The electricity company will survey the effects of demand response and incentives to DRA. - The supervising ministry will draw a plan for the project to demonstrate demand response. 	Short	300,000 TND
	PS-1-3: Demonstration Project for Actual Introduction		<ul style="list-style-type: none"> - The private business will establish a project company for DRA. - The supervising ministry will implement the demonstration project for DRA. 	Short–Medium	36,000,000 TND

Strategy	PS-1	Reduction of the Power Demand Load Peak through the Demand Control	
Plan	PS-1-1	Institutional Design of the Demand Response Project	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	The Ministry of Industry, Energy and Mines (MIEM)
Description			
<p>To introduce a new demand response project, it is necessary to decide and authorize a governmental ministry or organization that will supervise the project, so that the ministry/organization can lead the project. Currently, the Ministry of Industry, Energy and Mines (MIEM) supervises the electricity industry in Tunisia, so the function of the ministry will be expanded to serve as the ministry supervising the demand response project. This supervising ministry will take the initiative in institutional design for project promotion. To this end, necessary actions are proposed as follows.</p>			
<pre> graph LR A["PS-1-1 【MIEM】 Institutional designing"] --> B["【STEG】 Survey"] B --> C["【MIEM】 Plan"] C --> D["【MIEM】 Demonstration"] </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - The supervising ministry will conduct surveys and institutional design for the demand response project. - The supervising ministry will establish an organization to supervise the screening of the project. - The supervising ministry will establish an organization to lead the project operator. 	<ul style="list-style-type: none"> - MIEM - STEG - MICT < not limited > 	<ul style="list-style-type: none"> - MIEM will establish a committee to discuss the demand response system. - STEG and MICT will participate in the committee of the demand response system. - MIEM will survey the demand situation in each area. - STEG will survey supply and demand in power transmission and distribution systems in each area by hour. - MICT will consider transmission method enabling demand response and standardize the method. - The committee of the demand response system will review the survey results of STEG and the results of consideration by MICT, and propose institutional design to MIEM. - MIEM will review the proposal of the committee and institutionalize the system. - MIEM will establish a screening organization and advisory organization for the demand response project. 	
Indicator		Risk	
- The number of surveys conducted		<ul style="list-style-type: none"> - Because the surveys are basic surveys, they may take time. - Careful discussion will be needed for standardization because it has impact on competition in the industry. 	

Strategy	PS-1	Reduction of the Power Demand Load Peak through the Demand Control		
Plan	PS-1-2	Consideration of Project Feasibility and Planning		
Intervention Area	6 Governorates of the Southern Region	Implementing agency	STEG	
Description				
<p>To introduce the demand response project, it is necessary to plan a feasible project. STEG, which is in charge of the electricity industry, will survey and consider if demand response can be achieved, and present feasible candidate projects. The ministry will plan a demonstration project to investigate if one or more candidate projects are in fact feasible. To this end, necessary actions are proposed as follows.</p>				
<pre> graph LR A["[MIEM] Institutional designing"] --> B["[STEG] Survey"] B --> C["[MIEM] Plan"] C --> D["[MIEM] Demonstration"] subgraph PS-1-2 B C end </pre>				
Action Plan				
Actions	Relevant organizations		Role	
<ul style="list-style-type: none"> - The electricity company will establish a demand response organization. - The electricity company will survey the effects of demand response and incentives to DRA. - The supervising ministry will draw a plan for the project to demonstrate demand response. 	<ul style="list-style-type: none"> - STEG - MIEM 		<ul style="list-style-type: none"> - STEG will follow the system formulated by MIEM and establish an organization that warns DRA at the time of power peak. - The committee of the demand response system established by MIEM will support STEG to set and control the demand response pricing. - STEG will conduct surveys on setting and controlling the demand response pricing to set incentives to DRA. - The committee for demand response system will review the surveys conducted by STEG and formulate a plan for the project to demonstrate demand response. 	
Indicator			Risk	
-			<ul style="list-style-type: none"> - Setting the price for demand response is important and difficult, so careful discussion is required. - The field to conduct the demonstration test will be effectively determined in consultation with STEG. 	

Strategy	PS-1	Reduction of the Power Demand Load Peak through the Demand Control	
Plan	PS-1-3	Demonstration Project for Actual Introduction	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	The Ministry of Industry, Energy and Mines
Description			
<p>To promote the demand response project, it is necessary to implement a demonstration project prior to introduction of the full-scale actual project. The plan for the demonstration project should be formulated in accordance with the institutional design and surveys on the present situations. Then, the effect of demand response will be measured and assessed. To this end, necessary actions are proposed as follows.</p>			
<pre> graph LR A["[MIEM] Institutional designing"] --> B["[STEG] Survey"] B --> C["[MIEM] Plan"] C --> D["[MIEM] Demonstration"] subgraph PS-1-3 D end </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - The private business will establish a project company for DRA. - The supervising ministry will implement the demonstration project for DRA. 	<ul style="list-style-type: none"> - DRA - MIEM - STEG 	<ul style="list-style-type: none"> - MIEM will obtain the governmental budget and invite private companies to bid on the demonstration project. - DRA will establish a project company to apply for the openly invited project. - MIEM will screen proposals and adopt the project. - DRA adopted will discuss agreements on the demonstration project with STEG. - STEG will participate in the demonstration project in accordance with the system formulated by MIEM and in consultation with DRA. - DRA and STEG will jointly implement the demonstration project. - MIEM will compile achievements of the demonstration project and assess the results. - MIEM will decide if the full-scale project will be implemented, based on the assessment results and in consultation with STEG. 	
Indicator		Risk	
<ul style="list-style-type: none"> - The number of openly invited demonstration projects - The number of private companies applied for the demonstration project - The percentage of reduction in peak electricity due to DR 		<ul style="list-style-type: none"> - The electricity demand is susceptible to weather and other external factors, so the results of the demonstration project may vary from year to year. Thus, it is desirable to conduct demonstration projects in multiple areas in multiple years. 	

Sector	Strategy	PS-2	Increase the Amount of Available Energy by Reducing the ratio of Power Distribution Loss		
	Plan		Actions	Term	Cost
Power Supply	PS-2-1: Survey on the Current Situation and Consideration of Measures		<ul style="list-style-type: none"> - The electricity company will establish an organization to conduct survey and consider measures. - The electricity company will conduct survey to find causes of the current power distribution loss. - The electricity company will redesign power transmission and distribution based on the survey results. 	Short	7,000,000 TND
	PS-2-2: Efforts to implement the Design into Execution		<ul style="list-style-type: none"> - The electricity company will formulate an execution plan based on the redesign. - The electricity company will procure fund based on the project plan. - The electricity company will implement the plan into execution. 	Short–Medium	Depends on Design

Strategy	PS-2	Increase the Amount of Available Energy by Reducing the ratio of Power Distribution Loss	
Plan	PS-2-1	Survey on the Current Situation and Consideration of Measures	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	STEG
Description			
<p>To reduce power distribution loss, it is necessary first to understand the present situation and then consider measures. Since STEG alone is in charge of the power transmission and distribution business, it will establish an internal organization to undertake these tasks. Actions that the organization should take are presented as follows.</p> <pre> graph LR subgraph PS-2-1 [PS-2-1] S[Survey] --> R[Redesign] end R --> P[Plan] P --> E[Execution] A[Approval/license] --> E G["6 Gov's"] --> A </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - The electricity company will establish an organization to conduct survey and consider measures. - The electricity company will conduct survey to identify causes of the current power distribution loss. - The electricity company will redesign power transmission and distribution based on the survey results. 	<ul style="list-style-type: none"> - STEG 	<ul style="list-style-type: none"> - STEG will establish an organization in charge of the tasks ranging from survey to implementation of measures against power distribution loss. - The organization in charge at STEG will conduct survey to identify causes of the power distribution loss. - The organization in charge at STEG will consider measures based on the survey results. - The organization in charge at STEG will deal with designing and other technical problems of measures considered. - The organization in charge at STEG will consult the operating organization about measures of operational aspects considered, and formulate a new operational plan. 	
Indicator		Risk	
-		<ul style="list-style-type: none"> - It may turn out to be impossible to identify specific causes of power distribution loss. Thus, causes that can be handled need to be separated from those that cannot be handled. - Power distribution loss may be attributable to the weather and other force majeure. 	

Strategy	PS-2	Increase the Amount of Available Energy by Reducing the ratio of Power Distribution Loss		
Plan	PS-2-2	Efforts to implement the Design into Execution		
Intervention Area	6 Governorates of the Southern Region	Implementing agency	STEG	
Description				
Measures against power distribution loss that have been considered need to be planned and executed. An organization established within STEG will take the initiative. Actions that the organization should take are presented as follows.				
<pre> graph LR S["[STEG] Survey"] --> R["[STEG] Redesign"] R --> P["[STEG] Plan"] P --> E["[STEG] Execution"] A["[6 Gov's] Approval/license"] --> E subgraph PS-2-2 P E end </pre>				
Action Plan				
Actions	Relevant organizations	Role		
<ul style="list-style-type: none"> - The electricity company will formulate an execution plan based on the redesign. - The electricity company will procure fund based on the project plan. - The electricity company will put the plan into execution. 	<ul style="list-style-type: none"> - STEG - 6 Governorates of the South Region 	<ul style="list-style-type: none"> - The STEG organization in charge will consider the economic efficiency based on the redesign and formulate an economically efficient project plan. - The STEG organization in charge will formulate an execution plan based on the project plan. The execution plan includes procurement of necessary fund, schedule and arrangement of personnel within STEG. - The STEG organization in charge will take the procedures for approvals and obtaining licenses necessary for construction work. - The supervising agency to issue approvals and licenses for construction work will discuss and flexibly respond to applications from the STEG organization in charge. - The STEG organization in charge will procure fund based on the project plan. - The STEG organization in charge will implement the project into execution in accordance with the execution plan. 		
Indicator		Risk		
<ul style="list-style-type: none"> - The ratio of power distribution loss decreases from the current 15% to 11% by 2025. - The ratio of power distribution loss decreases from the current 15% to 7.5% by 2035. 		<ul style="list-style-type: none"> - The cost of formulating the STEG organization in charge may exceed the economic efficiency due to reduced power distribution loss. But the economic efficiency is expected to increase further in the long-term through project promotion by the organization. 		

Sector	Strategy	PS-3	Infrastructure Development in line with the Scenario of the Development Plan		
	Plan		Actions	Term	Cost
Power Supply	PS-3-1: Reflection of Future Forecast in the Plan		<ul style="list-style-type: none"> - Future demand and forecasting future installations - Creation of development scenario - Calculation of the necessary infrastructure capacity based on the future forecast and scenario 	Short	Included in this survey
	PS-3-2: Implementation of the Plan		<ul style="list-style-type: none"> - A plan for introduction will be formulated based on the necessary infrastructure capacity. - The introduction will be implemented in accordance with the plan. 	Short–Medium	3,680,000,000 TND

Strategy	PS-3	Infrastructure Development in line with the Scenario of the Development Plan		
Plan	PS-3-1	Reflection of Future Forecast in the Plan		
Intervention Area	6 Governorates of the Southern Region	Implementing agency	STEG	
Description				
<p>This development plan formulated a development plan for the Southern Region of Tunisia and forecast the future electricity demand. Together with the future development plan of STEG, this plan enables to calculate the electricity infrastructure capacity necessary for the plan. Actions necessary to calculate the infrastructure capacity are presented as follows.</p>				
<pre> graph TD subgraph PS31 [PS-3-1] JET1["[JET] Forecast"] --> JET2["[JET] Estimation"] JET3["[JET] Development plan"] --> JET2 end JET2 --> STEG1["[STEG] Plan"] STEG1 --> STEG2["[STEG] Execution"] </pre>				
Action Plan				
Actions	Relevant organizations	Role		
<ul style="list-style-type: none"> - Forecasting future demand and installations - Creation of development scenario - Calculation of the necessary infrastructure capacity based on the future forecast and scenario 	<ul style="list-style-type: none"> - JET - STEG 	<ul style="list-style-type: none"> - JET will forecast the future electricity demand. - STEG will supply JET with information about the development plan for the Southern Region. - JET will estimate the infrastructure capacity necessary for the development scenario in the Southern Region. 		
Indicator		Risk		
<ul style="list-style-type: none"> - Forecast values of electricity demand by region - Planned values of electricity infrastructure development by region 		<ul style="list-style-type: none"> - The estimation will be made in accordance with the development scenario in the Southern Region at the time of preparing this report, but the values may have to be revised if the development scenario is revised in the future. 		

Strategy	PS-3	Infrastructure Development in line with the Scenario of the Development Plan	
Plan	PS-3-2	Implementation of the Plan	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	STEG
Description			
<p>To realize the electricity infrastructure capacity calculated and necessary for the plan, it is necessary for STEG to formulate a plan. This plan will be implemented into execution according to the plan after procurement of fund. Actions necessary up to the actual execution are presented as follows.</p>			
<pre> graph LR JET1["[JET] Forecast"] --> JET2["[JET] Estimation"] JET3["[JET] Development plan"] --> JET2 JET2 --> STEG1["[STEG] Plan"] STEG1 --> STEG2["[STEG] Execution"] subgraph PS-3-2 STEG1 STEG2 end </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - A plan for introduction will be formulated based on the necessary infrastructure capacity. - The introduction will be implemented in accordance with the plan. 	<ul style="list-style-type: none"> - STEG - ODS 	<ul style="list-style-type: none"> - STEG will formulate an installation plan in accordance with the necessary infrastructure capacity. - STEG will formulate the installation plan for the infrastructure in consultation with ODS. - STEG will procure project fund in accordance with the plan. - STEG will implement the project into execution in accordance with the plan. - ODS is to introduce the projects currently in progress, explains the possibility of cooperation in the future. 	
Indicator		Risk	
-The future installation capacity of the electricity infrastructure		-The schedule of the infrastructure development follows regional development, so the initial plan may have to be revised later. It is important for STEG to proceed with the plan in consultation with the organization in charge of the development plan.	

Sector	Strategy	PS-4	Introducing Renewable Energy for Base Power and Peak Power Response		
	Plan		Actions	Term	Cost
Power Supply	PS-4-1: Overall Goal and Feasibility Study, and Formulation of a Plan based on Demand Forecast		<ul style="list-style-type: none"> - Surveying the volume of renewable energy that can be introduced - Forecasting the electricity demand in each area - Planning the introduction in consideration of the survey results and overall goal 	Short–Medium	3,000,000 TND
	PS-4-2: Improvement of Support Systems for Implementation of the Plan		<ul style="list-style-type: none"> - Support systems for implementation of the plan will be established. - The project will be executed according to the plan. 	Short–Medium	Depends on Plan

Strategy	PS-4	Introducing Renewable Energy for Base Power and Peak Power Response	
Plan	PS-4-1	Overall Goal and Feasibility Study, and Formulation of a Plan based on Demand Forecast	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	STEG
Description			
<p>The volume of available renewable energy varies among regions, and the introduction of renewable energy will have an impact on the electricity grid system in areas with low demand. Thus, it is necessary to forecast the demand and survey the volume of renewable energy that can be introduced before planning. It is also necessary to take into account the nation's target volume of renewable energy to be introduced. Actions for planning in consideration of these factors are presented as follows.</p>			
<pre> graph TD A["[STEG] Demand forecast"] --> B["[STEG-ER] Feasibility study"] B --> C["[STEG-ER] Plan"] D["[ANME] Overall goal"] --> C C --> E["[ANME] Execution"] subgraph PS41 [PS-4-1] A B C end </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Surveying the volume of renewable energy that can be introduced - Forecasting the electricity demand in each area - Planning the introduction in consideration of the survey results and overall goal 	<ul style="list-style-type: none"> - ANME - STEG - STEG-ER 	<ul style="list-style-type: none"> - STEG-ER will survey the volume of available renewable energy in each area, and identify the potentials by estimating the electricity and heat generation volumes for each type of energy. - STEG will forecast the electricity demand in each area, and perform case studies for each season in terms of both the capacity and power generation volumes. - ANME will estimate the overall goal set forth by the national government for each area. - STEG-ER will formulate a plan to introduce renewable energy in each area based on the electricity demand forecast and the volume of renewable energy that can be introduced. 	
Indicator		Risk	
<ul style="list-style-type: none"> - Potential of estimated renewable energy - Target volume of renewable energy to be introduced by region 		<ul style="list-style-type: none"> - There is a chance that the progress of renewable energy technology can alleviate impact on the electricity grid system. The plan needs to be formulated while paying attention to the technological trend. 	

Strategy	PS-4	Introducing Renewable Energy for Base Power and Peak Power Response	
Plan	PS-4-2	Improvement of Support Systems for Implementation of the Plan	
Intervention Area	6 Governorates of the Southern Region		Implementing agency STEG
Description			
<p>Renewable energy will be introduced in accordance with a plan formulated by STEG-ER, but it is assumed that various business operators will introduce renewable energy independently. Examination will be made on the installation, and the necessity to improve the support systems for implementation of the plan such as consultation to deal with various regulations in various areas.</p> <pre> graph LR DF["Demand forecast (STEG)"] --> Plan["Plan (STEG-ER)"] FS["Feasibility study (STEG-ER)"] --> Plan OG["Overall goal (ANME)"] --> Plan Plan --> Exec["Execution (ANME)"] subgraph PS42 [PS-4-2] Exec end </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Support systems for implementation of the plan will be established. - The project will be executed according to the plan. 	<ul style="list-style-type: none"> - MIEM - 6 Governorates of the South Region - ODS - Power producer - Small and Medium Scale Enterprises 	<ul style="list-style-type: none"> - ANME will secure resources to support power-generating business and invite private companies to bid on the power generating business. - The power producer will develop a business plan in compliance with the plan formulated by STEG-ER and apply for business operation to the supervising ministry. - MIEM will accept and examine the application for business operation from power producer, and issue approvals and licences for the business operation. - The power producer will apply for the open invitation of ANME to be accepted as the business operator. - If any deregulation or approvals and licences for construction work are necessary for implementation of the project, the power producer will consult ODS and make necessary applications to relevant supervising organizations. - The supervising organization in each area will examine the applications and flexibly deal with the deregulations, and approvals and licences. - Small and Medium Scale Enterprises in the South Region develop the analysis of electricity demand and the incentives. 	
Indicator		Risk	
<ul style="list-style-type: none"> - The volume of renewable energy to be introduced by area - The ratio of the peak capacity of renewable energy to the peak electricity 		<ul style="list-style-type: none"> - Power generating business may not be permitted because of the size in some cases. - Power producers may apply for power generating business exceeding the planned capacity. - It may be impossible to relax some of the regulations. - ANME may not be able to secure enough funds. 	

3.3.4 Telecommunication

(1) Summary of current situation

(a) Current situation

The number of mobile phone users is increasing explosively, and three companies, Tunisia Telecom, Ooredoo, and Orange, are competing. However, there are few fixed line users. Tunisia Telecom the mobile phone service of the communication enterprises covers the residential area mostly. A 32-Gbps high-speed line is installed as a National Network connecting main cities. Moreover, there is an International Gateway which had a capacity of 90 Gbps in 2013.

"The Global Information Technology report 2012" of World Economic Forum reported that Tunisia has a subject in respect of mechanical possession and Internet penetration rate, or security although practical use of ICT to social environment is expected.

Although the number of mobile phone users is increasing explosively in the Southern Region and as well as in the whole country, there are few fixed line users. Metro Network is managed by the district of each area. Although the mobile phone service covers almost all the city area where population concentrates, it does not cover areas, such as the desert area.

(b) Current issue

From the current situation, the following issues are considered:

- Since the quantity of data communications increases with the spread of mobile phones, there is a concern of exceeding the present bandwidth. Furthermore, there is a concern that this may lead to the deterioration of the communication quality.
- For economical reason, the diffusion rate of the data-communications of the mobile phone internet may still be low.
- There is a concern that the conventional operation method may not be properly applicable when the coverage of a mobile phone spreads to the non-inhabitable area of the southern part area.

To deal with the above issues, the following works are required:

- Predicting the future demand, and grasp the capacity required in order to secure the communication quality
- Estimating the additional capacity needed in the Southern Region, and examine whether the measure against which level is effective, and draw up a strategy

(2) Demand Forecast

The telecommunication in Tunisia is spreading, and this may be grasped by seeing the number of subscribers. If the capacity of an infrastructure is small, it will become impossible to transmit the data when data volume that flows into the communications network increases. Therefore knowing capacity of internet bandwidth leads to grasping the situation of data volume.

Infrastructure to be constructed and management institution to be established are examined by estimating the future figures of these indicators.

(a) Estimation Method

Demand is forecast in the following two steps:

- 1) Estimation of Internet Bandwidth for the whole country.
- 2) Estimation of Internet Bandwidth for the Southern Region based on the results of the

estimation whole country.

The internet demand is estimated utilising the following data:

- Capacity of Internet Bandwidth (2006– 2013: Ministry of ICT)
- Number of internet subscribers (2006– 2013: Ministry of ICT)
- Number of Internet subscribers (/100 habitants) (2006– 2013: Ministry of ICT)
- Population data of the whole country (1995–2013)
- Population forecast of the whole country (2025 and 2035)
- Population of the Southern Region (2012)
- Population forecast of the Southern Region (2025 and 2035)
- Number of internet users (2012, chiffres provided by ODS, ect.)

Estimation of Internet Bandwidth for the whole country is carried out in the following procedures:

- 1) A relational equation (model) of number of subscribers to internet and capacity of internet bandwidth is created by regression analysis.
- 2) A relational equation (model) of number of internet subscribers (/100 habitants) and the years is created by regression analysis, and the user rate (internet subscribers/100 habitants) by 2035 is then estimated.
- 3) Population in 2035 is forecasted.
- 4) Number of internet subscribers by 2035 is estimated on the basis of the population projection and the number of internet subscribers (/100 habitants).
- 5) Capacity of internet bandwidth by 2035 is estimated by using the number of internet subscribers forecasted as an input into the model.

Estimation of Internet Bandwidth for the Southern Region is carried out in the following procedures:

- 1) Data of number of subscribers to internet in the Southern Region in 2012 are created based on known information (chiffres provided by ODS, etc.)
- 2) Number of internet subscribers of the country estimated is divided by that of each governorate of the Southern Region with the propotion of population.
- 3) A correction coefficient is calculated using the result of the above 2) and the actual data on internet capacity of the Southern Region in 2012.
- 4) Number of internet subscribers of the Southern Region in 2025 and 2035 is divided by that of each governorate of the Southern Region with the propotion of forecasted population in 2025 and 2035.
- 5) Capacity of internet bandwidth of Southern Region in 2025, 2035 is estimated by using the number of internet subscribers as an input into the model.

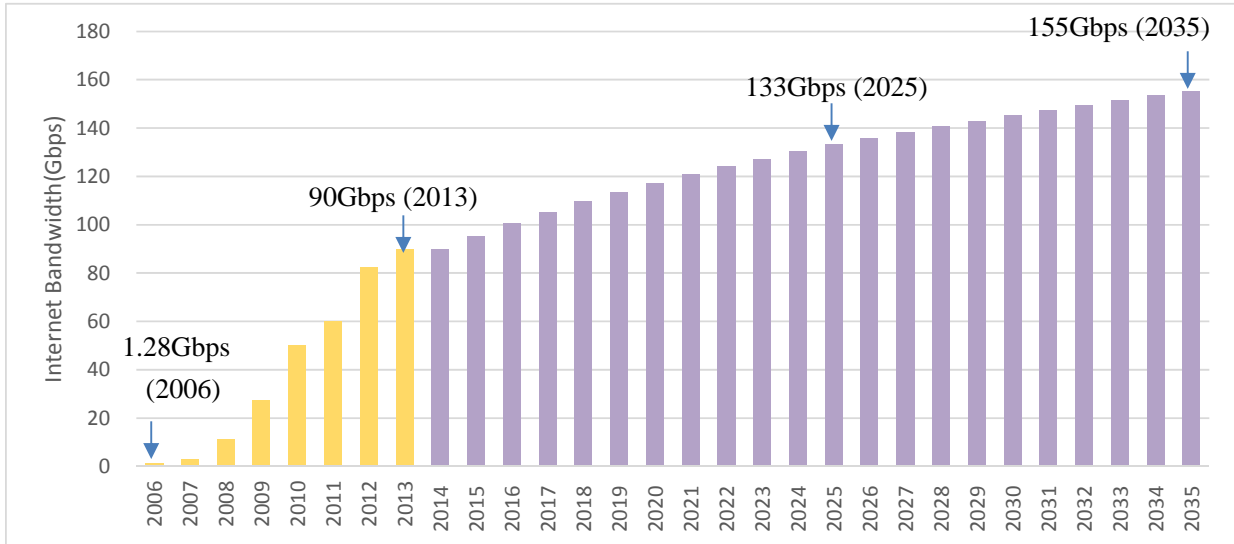
(b) Estimation Result

The estimations are calculated assuming the following conditions:

- The number of internet subscribers and capacity of internet bandwidth has a logarithmic relationship.
- The number of internet subscribers (/100 habitants) and the year has a linear relationship.
- The number of internet subscribers (/100 habitants) is set at 30.84% in 2025, and 46.84% in 2035.

- Interpolation of population data is calculated by linear approximation.

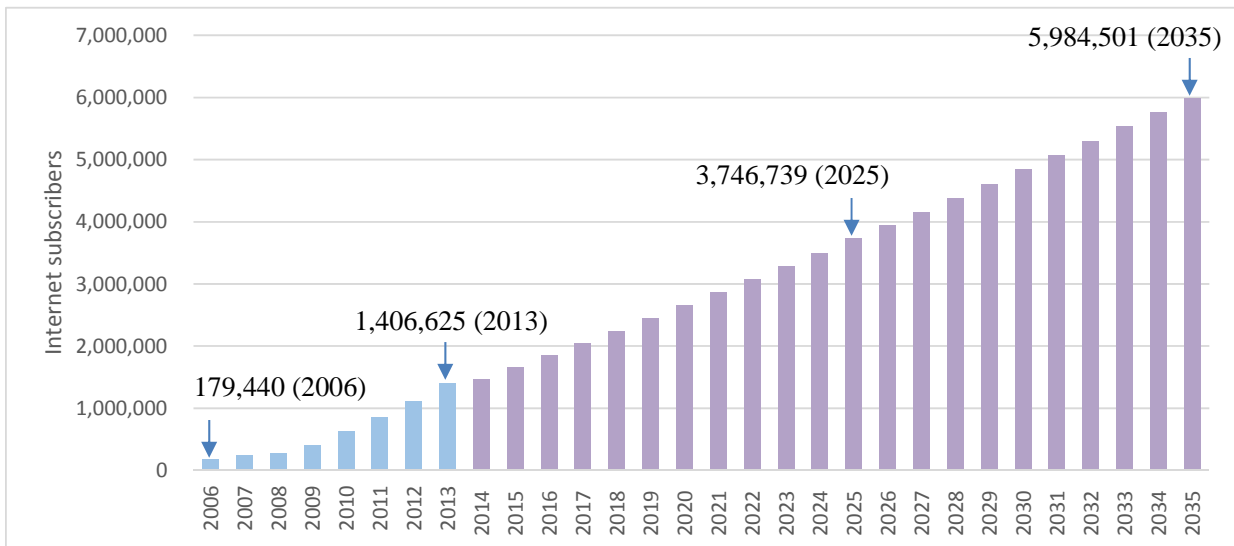
Estimated result of capacity of internet bandwidth is shown below. The bandwidth was 90 Gbps in 2013., and it will increase to 133 Gbps in 2025, and to 155 Gbps in 2035.



Source: JET

Figure 3.3-31 Estimated Result of capacity of internet bandwidth

Estimated result of number of internet subscribers (/100 habitants) is shown below. The number was about 1.4 million in 2013, and it will increase to about 3.75 million in 2025, and to about 6 million in 2035.



Source: JET

Figure 3.3-32 Estimated result of internet subscribers

The results of the estimation are as follows:

- Compared with the 2013 value, the internet bandwidth will increase by 1.48 times by 2025, and by 1.72 times by 2035.

- Compared with the 2013 value, internet Subscribers will increase by 2.66 times by 2025, and will increase by 4.25 times by 2035.

The estimations for the Southern Region are conducted based on the estimation result of whole country assuming the following conditions:

- Number of internet subscribers of the Southern Region recorded is as shown in the table below.
- In order to estimate, substitute the average value for the a place without data.

Table 3.3-47 Number of internet subscribers of the Southern Region in 2012

District	Number
Gabès	*38,014
Médenine	30,934
Tataouine	5,408
Gafsa	*35,598
Tozeur	5,843
Kébili	7,573
Total	123,370

Note: * estimated with average

Source: JET

Table 3.3-48 Estimated results of telecommunication demand in the Southern Region

		Internet Subscribers			Capacity of Internet Bandwidth (Gbps)		
		2012	2025	2035	2012	2025	2035
Gafsa	Quantity	35,598	60,404	96,480	7.2	11.7	17.4
	Ratio	1.00	1.70	2.71	1.00	1.62	2.42
Gabès	Quantity	38,014	64,045	102,296	7.7	12.3	18.3
	Ratio	1.00	1.68	2.69	1.00	1.60	2.39
Kébili	Quantity	7,573	25,657	40,980	3.4	5.3	8.2
	Ratio	1.00	3.39	5.41	1.00	1.58	2.44
Médenine	Quantity	30,934	104,824	167,431	9.5	18.7	27.1
	Ratio	1.00	3.39	5.41	1.00	1.96	2.84
Tataouine	Quantity	5,408	18,127	28,953	3.2	3.8	6.0
	Ratio	1.00	3.35	5.35	1.00	1.18	1.85
Tozeur	Quantity	5,843	19,996	31,939	2.3	4.2	6.5
	Ratio	1.00	3.42	5.47	1.00	1.79	2.79
Total	Quantity	123,370	293,052	468,079	33.3	55.9	83.5
	Ratio	1.00	2.38	3.79	1.00	1.68	2.50

Source: JET

Results of the Southern Region are summarised as follows:

- Compared with the 2012 value, the internet subscribers will increase by 2.38 times in 2025, and by 3.79 times in 2035.
- Compared with the 2012 value ,the capacity of internet bandwidth will increase by 1.68 times in 2025, and by 2.50 times in 2035.
- The bandwidth of the backbone installed now is 32Gbps , and it sufficient for southern region.
- The bandwidth of the backbone of the Southern Region will increase to 55.9 Gbps in 2025, and

83.5 Gbps in 2035.

- The bandwidth of the backbone will run short of 23.9Gbps in 2025, and 51.5Gbps in 2035.
- The capacity shortage in 2035 will be 241.6 MW in Gafsa, 265.3MW in Gabès, 46.4 MW in Kébili, 68.8 MW in Médenine, 18.6 MW in Tataouine, 73.5 MW in Tozeur.
- Metro network of 30Gbps class is needed for Médenine, 20Gbps class for Gafsa and Gabès, 10Gbps class for Kébili and Tataouine and Tozeur.

(3) Strategies and Plans

Considering the estimated results of the telecommunication demands, the two strategies shown in Table 3.3-49 are proposed:

Table 3.3-49 Strategies on Telecommunication in the Southern Region

Code	Strategy	Effect (Direct / Indirect)			Indicator
		Value-added	Job creation	Sustainability	
TC-1	Improvement of Telecommunication Quality	Establish a high speed and the stable communication line			• Telecommunication speed will be increased to 000Gbps by the year 2035.
TC-2	Diffusion of Wireless-Communication Environment	Improvement in productivity utilizing communication technology	Expansion of the new business opportunity utilizing the Internet	Decreasing movement by not receiving space restrictions.	• Public-wireless-LAN diffusion rate will be increased to 000.0% by the year 2035 • Next-generation wide range wireless communication diffusion rate will be increased to 000.0% by the year 2035 • The number of website will be increased to 000 by the year 2035

Source: JET

(a) TC-1: Improvement of communication quality

(i) Objective of the Strategy

According to the increase of the communication demand, the installation of additional network infrastructures, such as National Network and Metro Network, will be needed. Concurrently with expanding communication demand, the importance of network stability and safety will increase as more importance communication increases in the society. The threat of serious attacks on the network will also increase. Concerning these subjects, strengthening the network and improving the safety measures and organization will help in securing better communication quality.

(ii) Direct/Indirect Effects

The strategies will bear the following direct and indirect effects:

- Telecommunication line speed will improve.
- Telecommunication stability will improve.
- Telecommunication cost will decrease.
- Network communication comfort will improve.

(iii) Indicators

The following indicator is set to monitor the result of implementation of the strategy:

- Telecommunication speed improvement of the National network, Metro network and an access line.

(iv) Development Plan

< TC-1-1: Building Organization to Improve Telecommunication Quality >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- Building an organization to improve the telecommunication quality

Short- to Mid-term (2015–2025):

- Having discussion to improve the telecommunication quality

< TC-1-2: Consideration of System for Telecommunication Quality >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015–2020):

- The committee to improve the telecommunication quality will survey the current telecommunication environment.

Mid-term (2020-2025):

- Based on the survey results, a system to improve the telecommunication quality will be designed.
- Infrastructure development will be planned within the framework of the system.

< TC-1-3: Efforts for Improvement of Telecommunication Quality >

The plan will be realized through implementing the following actions:

Mid-term (2020–2025):

- A system to support implementation of the plan will be established.
- The telecommunication company will take the initiative in implementing measures.

(b) TC-2: Maintenance of wireless-communication environment

(i) Objective of the Strategy

Once wired-communications become common, almost all people will use the mobile phone as a main communication method by rapid increase of users. Moreover, only calling devices are quickly replaced by highly efficient devices such as smart phones. However, of users of such devices with the wireless data communications technology is limited because of high cost. With improving wireless communication line speed and its environment, the telecommunication will support social activities, further generalise and increase convenience.

(ii) Direct/Indirect Effects

The following direct and indirect effects will be generated by the implementation of the strategy:

- More people can use more high-speed wireless communications.
- More people can access Internet.
- New economic activities and social activities through the internet will be created.
- Economic activity and facilitation of social activity will be improved.

(iii) Indicators

The following indicators are set to monitor results of implementation of the strategy:

- Diffusion rate of public wireless LAN
- Diffusion rate of next-generation wide range wireless communications
- Number of websites created by, for instance, NGOs and EC entities

(iv) Development Plan

< TC-2-1: Building of an Organization to Discuss Information Disparity >

The plan will be realized through implementing the following actions:

Short-term (2015–2020):

- Building an organization to correct the information disparity

Short- to Mid-term (2015–2025):

- Having discussion to correct the information disparity

< TC-2-2: Consideration of a System to Promote Correction of Disparity >

The plan will be realized through implementing the following actions:

Short- to Mid-term (2015–2020):

- The committee to correct the information disparity will survey the current telecommunication environment.

Mid-term (2020–2025):

- Based on the survey results, a system to correct information disparity will be designed.
- Infrastructure development will be planned within the framework of the system.
- Enact a law for introducing universal service.

< TC-2-3: Efforts to Establish Wireless-Communication Environment >

The plan will be realized through implementing the following actions:

Mid-term (2020–2025):

- A system to support implementation of the plan will be established.
- The telecommunication company will take the initiative in implementing measures.

(4) Action plans

Action plans are summarized in action plan sheets shown on the next page.

Sector	Strategy	TC-1	Improvement of Telecommunication Quality		
	Plan		Actions	Term	Cost
Telecommuni- cation	TC-1-1: Building Organization to Improve Telecommunication Quality		<ul style="list-style-type: none"> - Building an organization to improve the telecommunication quality - Having discussion to improve the telecommunication quality 	Short– Medium	500,000 TND
	TC-1-2: Consideration of System for Telecommunication Quality		<ul style="list-style-type: none"> - The committee to improve the telecommunication quality will survey the current telecommunication environment. - Based on the survey results, a system to improve the telecommunication quality will be designed. - Infrastructure development will be planned within the framework of the system. 	Short - Medium	300,000 TND
	TC-1-3: Efforts for Improvement of Telecommunication Quality		<ul style="list-style-type: none"> - A system to support implementation of the plan will be established. - The telecommunication company will take the initiative in implementing measures. 	Medium	160,000,000 TND

Strategy	TC-1	Improvement of Telecommunication Quality	
Plan	TC-1-1	Building Organization to Improve Telecommunication Quality	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	MICT
Description			
<p>To improve the telecommunication quality, the supervising ministry (MICT) has to take the initiative to build an organization in charge of considering relevant measures. Various organizations will be involved in the organization to be built for a wide range of activities. Actions necessary for this plan are presented as follows.</p>			
<pre> graph LR A["TC-1-1 【MICT】 Organization building"] --> B["【MICT】 Survey"] B --> C["【MICT】 Institutional designing"] C --> D["【Telecommunication company】 Execution"] </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Building an organization to improve the telecommunication quality - Having discussion to improve the telecommunication quality 	<ul style="list-style-type: none"> - MICT - Telecommunication companies - Tunisia CERT 	<ul style="list-style-type: none"> - MICT will establish a committee of relevant organizations to discuss the improvement of the telecommunication quality. - Each telecommunication company will establish an organization to improve the telecommunication quality and participate in the committee of MICT. - Tunisia CERT will cooperate with the committee of MICT to improve the telecommunication quality from the viewpoint of security. - The committee will commence surveys, discussion and other activities about standards, measurement basis and other aspects to improve the telecommunication quality. - The committee of MICT will consider establishing an organization to assess the telecommunication quality. This organization can be established as a committee under an existing corporate body. 	
Indicator		Risk	
- The number of organizations participating in the committee		- It is necessary to involve a wide range of organizations in the committee.	

Strategy	TC-1	Improvement of Telecommunication Quality	
Plan	TC-1-2	Consideration of System for Telecommunication Quality	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	MICT
Description			
<p>The committee will conduct surveys and institutional design necessary for improvement of telecommunication quality in accordance with the results of discussion. The surveys will seek standards applicable to assessment of the telecommunication quality, and understand the current situation in accordance with the assessment. The committee will discuss and consider the results of these surveys and propose necessary measures. A system necessary for promoting the proposed measures will be established, and measures that the telecommunication company can take will be considered. Actions necessary for these activities are presented as follows.</p>			
<pre> graph LR A["[MICT] Organization building"] --> B["[MICT] Survey"] B --> C["[MICT] Institutional designing"] C --> D["[Telecommunication company] Execution"] subgraph TC-1-2 B C end </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - The committee to improve the telecommunication quality will survey the current telecommunication environment. - Based on the survey results, a system to improve the telecommunication quality will be designed. - Infrastructure development will be planned within the framework of the system. 	<ul style="list-style-type: none"> - MICT - Telecommunication companies - CERT 	<ul style="list-style-type: none"> - The committee of MICT will discuss the definition and categorization of the telecommunication quality, and formulate standards to assess the quality. - The committee of MICT will survey the current telecommunication environment in line with the assessment standards. - All the telecommunication companies will cooperate in the surveying and report on the current telecommunication environment. - CERT will provide advice on the series of discussion from the viewpoint of security. - The committee of MICT will discuss matters to be established as systems and measures to be taken in accordance with the survey results, and compile the discussion as recommendations to MICT. - MICT will receive the recommendations and consider measures that the telecommunication company and related corporate bodies can take. 	
Indicator		Risk	
<ul style="list-style-type: none"> - Items used to assess the telecommunication quality - The number of surveys on the current telecommunication quality - The number of measures to improve the telecommunication quality 		<ul style="list-style-type: none"> - Careful discussion on the items used to assess the telecommunication quality is required, because they are important for the process of the project afterwards. It is desirable to refer to cases in other countries while deciding which items to be adopted. 	

Strategy	TC-1	Improvement of Telecommunication Quality	
Plan	TC-1-3	Efforts for Improvement of Telecommunication Quality	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	Telecommunication company
Description			
<p>After the committee discusses improvement of the telecommunication quality, MICT will work to design measures, which will be implemented by the telecommunication company. It is also important for the government to provide support for smooth implementation of the measures. The organization for assessment will continue engaging in assessment and make recommendations for support. The telecommunication companies will report on the results of their activities and continue making recommendations for improvements and measures to be taken. Actions necessary for these activities are presented as follows.</p>			
<pre> graph LR A["[MICT] Organization"] --> B["[MICT] Survey"] B --> C["[MICT] Institutional designing"] C --> D["[TC-1-3] [Telecommunication company] Execution"] style D stroke-dasharray: 5 5 </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - A system to support implementation of the plan will be established. - The telecommunication company will take the initiative in implementing measures. 	<ul style="list-style-type: none"> - MICT - Telecommunication company - CERT 	<ul style="list-style-type: none"> - Following the discussion of the committee, the telecommunication company will implement measures institutionalized by MICT. - The government's support including subsidies will be provided to crucial parts of infrastructure development. - The assessment organization will assess achievements of measures implemented by the telecommunication company. - The organization to assess the telecommunication quality will make recommendations on implementation of measures based on its knowledge gained through its activities. - MICT will consider supportive measures based on recommendations from the assessment organization. - CERT will report to MICT if it finds any impact or risk of the project through its normal activities in normal time. 	
Indicator		Risk	
<ul style="list-style-type: none"> - External fund for measures to improve the telecommunication quality - The number of recommendations made by the organization to assess the telecommunication quality 		<ul style="list-style-type: none"> - The telecommunication company may have difficulty in implementing measures whose beneficiary effects are unclear. The government is expected to support the promotion of such measures. - Infrastructure development may cause security risk. Thorough information management is important. 	

Sector	Strategy	TC-2	Diffusion of Wireless-Communication Environment		
	Plan		Actions	Term	Cost
Telecommuni- cation	TC-2-1: Building of an Organization to Discuss Information Disparity		<ul style="list-style-type: none"> - Building an organization to correct information disparity - Having discussion to correct information disparity 	Short– Medium	300,000 TND
	TC-2-2: Consideration of a System to Promote Correction of Disparity		<ul style="list-style-type: none"> - The committee to correct information disparity will survey the current telecommunication environment. - Based on the survey results, a system to correct information disparity will be designed. - Infrastructure development will be planned within the framework of the system. 	Short– Medium	200,000 TND
	TC-2-3: Efforts to Establish Wireless-Communication Environment		<ul style="list-style-type: none"> - A system to support implementation of the plan will be established. - The telecommunication company will take the initiative in implementing measures. 	Medium	8,000,000 TND

Strategy	TC-2	Diffusion of Wireless-Communication Environment	
Plan	TC-2-1	Building of an Organization to Discuss Information Disparity	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	MICT
Description			
<p>To correct information disparity, the supervising ministry (MICT) has to take the initiative to build an organization in charge of considering relevant measures. Various organizations will be involved in the organization to be built for a wide range of activities. Actions necessary for this plan are presented as follows.</p>			
<pre> graph LR A["【MICT】 Organization building"] --> B["【MICT】 Survey"] B --> C["【MICT】 Institutional designing"] C --> D["【Telecommunication company】 Execution"] </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - Building an organization to correct information disparity - Having discussion to correct information disparity 	<ul style="list-style-type: none"> - MICT - ODS - Telecommunication companies - NGO/NPO - Tunisia CERT 	<ul style="list-style-type: none"> - MICT will establish a committee of relevant organizations to discuss the improvement of the information disparity. - The telecommunication company will establish an organization to correct information disparity and participate in the committee of MICT. - NGOs/NPOs will participate in the committee of MICT and cooperate in the correction of information disparity from the viewpoint of users or ordinary citizens. - ODS will participate in discussion about development effects of correction of information disparity in the southern region. - Tunisia CERT will participate in the committee of MICT and make recommendations on concerns arising from correction of information disparity from the viewpoint of security. - The committee will commence surveys, discussion and other activities about assessment standards and correction of information disparity. - The committee of MICT will consider establishing an organization to assess information disparity. This organization can be established as a committee under an existing corporate body. 	
Indicator		Risk	
- The number of organizations participating in the committee		- It is necessary to involve on a wide range of organizations in the committee.	

Strategy	TC-2	Diffusion of Wireless-Communication Environment		
Plan	TC-2-2	Consideration of a System to Promote Correction of Disparity		
Intervention Area	6 Governorates of the Southern Region	Implementing agency	MICT	
Description				
<p>The committee will conduct surveys and institutional designing necessary for correction of information disparity in accordance with the results of discussion. The surveys will seek standards applicable to assessment of the telecommunication quality, and understand the current situation in accordance with the assessment. The committee will discuss and consider the results of these activities and propose necessary measures. A system necessary for promoting the proposed measures will be established, and measures that the telecommunication company can take will be considered. Actions necessary for these activities are presented as follows.</p>				
<pre> graph LR A["【MICT】 Organization building"] --> B["【MICT】 Survey"] B --> C["【MICT】 Institutional designing"] C --> D["【Telecommunication company】 Execution"] subgraph TC-2-2 B C end </pre>				
Action Plan				
Actions	Relevant organizations	Role		
<ul style="list-style-type: none"> - The committee to correct information disparity will survey the current telecommunication environment. - Based on the survey results, a system to correct information disparity will be designed. - Infrastructure development will be planned within the framework of the system. - Enact a law for introducing the Universal service⁴⁶. 	<ul style="list-style-type: none"> - MICT - ODS - Telecommunication company - NGO/NPO - Tunisia CERT 	<ul style="list-style-type: none"> - The committee of MICT will discuss the definition and categorization of information disparity, and formulate standards to assess corrections. - The committee of MICT will survey the current situation in line with the assessment standards. - The telecommunication company will cooperate in the surveying and report on the current situation. ODS will also cooperate in the surveying. - NGOs/NPOs will participate in the discussion as representative of the users or ordinary citizens. - CERT will provide advice on the series of discussion from the viewpoint of security. - The committee of MICT will discuss matters to be established as systems and measures to be taken in accordance with the survey results, and compile the discussion as recommendations to MICT. - MICT will receive the recommendations and consider measures that the telecommunication companies and related corporate bodies can take. 		
Indicator		Risk		
<ul style="list-style-type: none"> - Items used to assess information disparity - The number of surveys information disparity - The number of measures to correct information disparity 		<ul style="list-style-type: none"> - Careful discussion on items used to assess information disparity is required, because they are important for the process of the project afterwards. It is desirable to refer to cases in other countries while deciding which items to be adopted. 		

⁴⁶ Universal service: A universal service is a charge system of the telecommunication introduced in France, UK, USA, Japan and many countries. Even if there is an area which isn't profitable, it's possible to maintain a telecommunication network by this service. The telecommunication service is indispensable for a national life, but it's difficult to spread in the rural area. So a telecommunication companies collect the small charge widely from the general user of telecommunication service and returns to development of rural area from the fund.

Strategy	TC-2	Diffusion of Wireless-Communication Environment	
Plan	TC-2-3	Efforts to Establish Wireless-Communication Environment	
Intervention Area	6 Governorates of the Southern Region	Implementing agency	Telecommunication company
Description			
<p>After the committee discusses correction of information disparity, MICT will work to design measures, which will be implemented by the telecommunication companies. It is also important for the government to provide support for smooth implementation of the measures. The organization for assessment will continue engaging in assessment and make recommendations for support. The telecommunication company will report on the results of their activities and continue making recommendations for improvements and measures to be taken. Actions necessary for these activities are presented as follows.</p>			
<pre> graph LR A["[MICT] Organization building"] --> B["[MICT] Survey"] B --> C["[MICT] Institutional designing"] C --> D["[Telecommunication company] Execution"] subgraph TC23 [TC-2-3] D end </pre>			
Action Plan			
Actions	Relevant organizations	Role	
<ul style="list-style-type: none"> - A system to support implementation of the plan will be established. - The telecommunication company will take the initiative in implementing measures 	<ul style="list-style-type: none"> - MICT - ODS - Telecommunication company - NGO/ NPO - Tunisia CERT 	<ul style="list-style-type: none"> - Following discussion of the committee, the telecommunication company will implement measures institutionalized by MICT. - The government's support including subsidies will be provided to infrastructure development. - The assessment organization will assess achievements of measures implemented by the telecommunication company. - The organization to assess the telecommunication quality will make recommendations on implementation of measures based on its knowledge gained through its activities. - CERT will pay attention to security risk which could arise from installation of infrastructure and, and report to the relevant parties if any problem occurs. - MICT will consider supportive measures based on recommendations from the assessment organization. - NGOs/NPOs will report to MICT through the assessment organization if any problem arises from this project in normal activities or if they have any recommendations to improve the situation. 	
Indicator		Risk	
<ul style="list-style-type: none"> - The number of places where infrastructures are newly installed 		<ul style="list-style-type: none"> - Sufficient explanation should be given to parties concerned because some areas have had the infrastructure prior to others. For this, it is important to ensure the cooperation of ODS. - The telecommunication developed under the project may be abused. It is important to monitor the network and deal with security risk. 	

3.4 Cross-cutting strategies and plans

3.4.1 Sustainable water resource management

(1) Current situation and shifting of paradigm of groundwater resources use and management

The current situation of groundwater exploitation and resource is explained in detail, governorate-by-governorate and aquifer-by-aquifer, in Section 4.3.2 of Part I of the Interim Report. However, the objective of the current part is not to focus on details but inversely to draw up the global trend of the use and management of the resource that is an absolute prerequisite for development but at the same time threatened in the future.

Indeed, taking into consideration, on the one hand, the exploitation rate of rechargeable water tables and the critical situation of non-rechargeable fossil groundwater systems in the Southern Region in Tunisia, and on the other hand, the necessity for all sectors of development to acquire water in order to meet their needs of growth, it is clear that the management of groundwater resource is an inevitable strategic issue for the future development of the region.

(a) Current situation of groundwater resources use and management

Southern Tunisia, just similarly to the arid regions of the neighboring countries of Algeria and Libya, has based its modern development, agricultural, industrial and touristic, almost exclusively thanks to the exploitation of the great fossil aquifers of the Complexe Terminal (CT) and the Continental Intercalaire (CI). Those deep aquifers, reached by contemporary drilling techniques similar to the ones used in modern petroleum industry, can provide water of both high quantity and quality (potable, usable for irrigation etc.).

The problem of those deep fossil aquifers, inversely to shallow aquifers that can recharge with the natural water cycle, is that their resource is almost not rechargeable. The exploitation of fossil resource thus leads to its outright depletion in the future. Even though governments and specific organizations such as Sahara and Sahel Observatory (OSS) are trying to identify the amount and the trends of evolution of the resource, exact figures of amount and horizon of complete depletion are difficult to define. Nevertheless, the following characteristics should be taken into consideration to highlight the current situation of groundwater resources use and management.

In the whole Tunisia, the number of wells has doubled in 20 years, passing from 60,000 wells in 1980 to 120,000 in 2000. From that date, the increase in the number of wells has continued during the past 15 years.⁴⁷

Agriculture is the most demanding sector and it is also the sector for which the demand will increase the most in the future. The water allocation for agriculture irrigation in Tunisia is comprised between 0.7 and 1.1 l/s per hectare but the average of 0.5 seems closer to the reality, which leads to an average of 15,000 m³/ha/year. The estimations from OSS indicate a growth of the irrigated surfaces in Tunisia from 40,000 ha in 2000, to 55,000 ha in 2020 and to 70,000 ha in 2030.

In terms of drinking water, a strong increase of the demand is forecasted from 27 million of m³ in 2004 to 39 million in 2016 and 59 million in 2030 in Tunisia, leading to a global demand of 400 to 500 million of m³ in 2030 in the whole zone of the SASS⁴⁸.

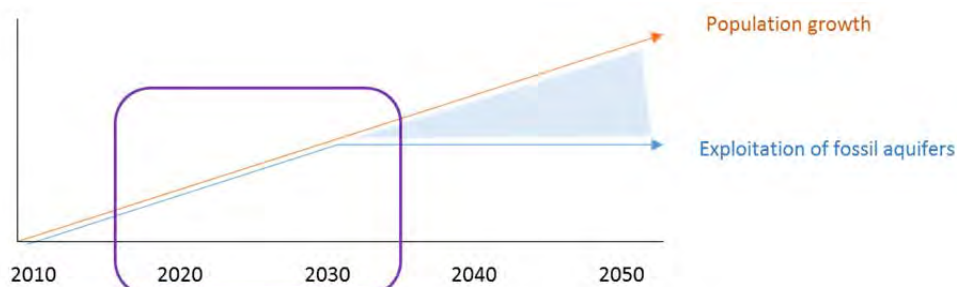
⁴⁷ *Usage agricole des eaux souterraines et initiatives de gestion au Maghreb: défis et opportunités pour un usage durable des aquifères*, Note Economique, AfDB – BafD, 2011.

⁴⁸ *Système Aquifère de Sahara Septentrional (Algérie, Tunisie, Lybie) : gestion commune d'un bassin transfrontalier*, OSS, Tunis, 2008, 48p.

(b) Necessity of shifting groundwater resources use and management paradigm

(i) General perspective

As explained during our visit, SONEDE is taking the horizon 2030 as the deadline for the stabilization of the exploitation of non-rechargeable fossil aquifers, as symbolized in the Figure 3.4-1 below. The gap created by the new demand (in blue) should be filled by new types of water resource mobilization such as desalination or reuse of treated waste water.



Source: JET based on interviews of SONEDE

Figure 3.4-1 Schematic timeline of the objective of maintaining fossil aquifer exploitation

Target period of regional development planning by the Project extends even after the end of the era of “free” exploitation of fossil aquifers, so it might be understood that strategies and plans proposed by the Project have to include the preparatory works for the change towards a new and sustainable development paradigm, whose realization will be supported by not only the following strategies, plans and action plans, but also the ones formulated in the field of water infrastructure (Section 3.3.2) and agriculture sector (Section 3.2.1).

(ii) Specificities of South-West and Southeast perspectives

The general concept of the shifting effort for a more sustainable groundwater use and management can be described as follows, in different terms for South-West and Southeast, and in relation with the other strategies, plans and action plans

In the South-West, as shown in Figure 3.4-2 below, all sectors currently draw on the non-rechargeable groundwater systems of CT and CI. Farmers refuse in particular to use shallow water tables because of their high salinity. The reduction of the load on deep groundwater tables can be made possible by switching all industrial, tourist and domestic water⁴⁹ exploitation to shallow groundwater tables by desalinating their brackish water with demineralization stations (strategy WA-2). Regarding the exhaustion of irrigation water, introduction and dissemination of water saving techniques (strategy AG-1, plan AG-1-1) as well as small desalination units (strategy AG-4, plan AG-4-2) are proposed.

⁴⁹ “Touristic water” stands for “Drinking water for touristic use” while “Domestic water” stands for “Drinking water for domestic use”.

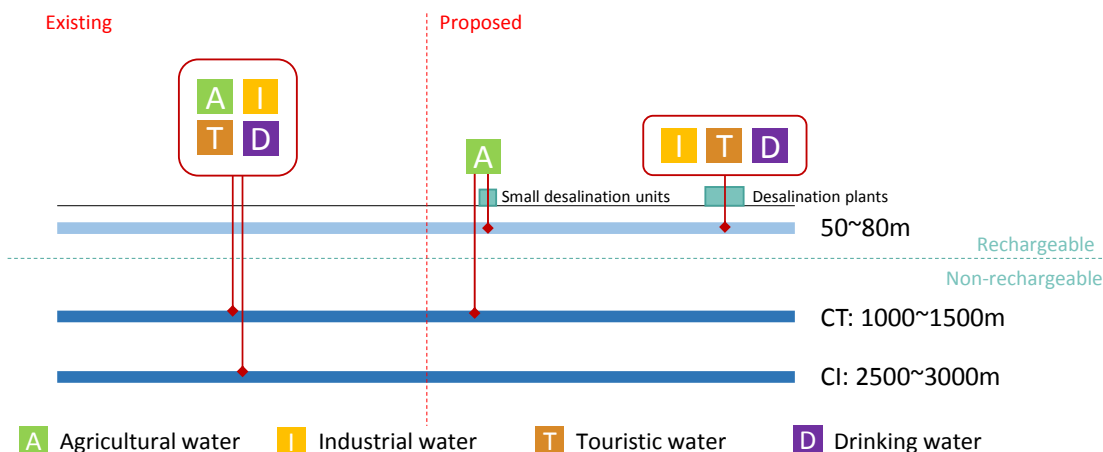


Figure 3.4-2 Simplified diagram of the switching in exploitation of groundwater resources in the South-West region in Tunisia

In the Southeast, as shown in the Figure 3.4-3 below, the goal is to reduce the load on deep water tables, and get back to a groundwater table exploitation rates below 100% in order to achieve an effective sustainable recharge. In view of the proximity of the coast, the use desalination plants of seawater to supply industrial and domestic water is promoted (strategies WA-2 and WA-3). Agriculture could then continue to tap into consequently rebalanced groundwater tables.

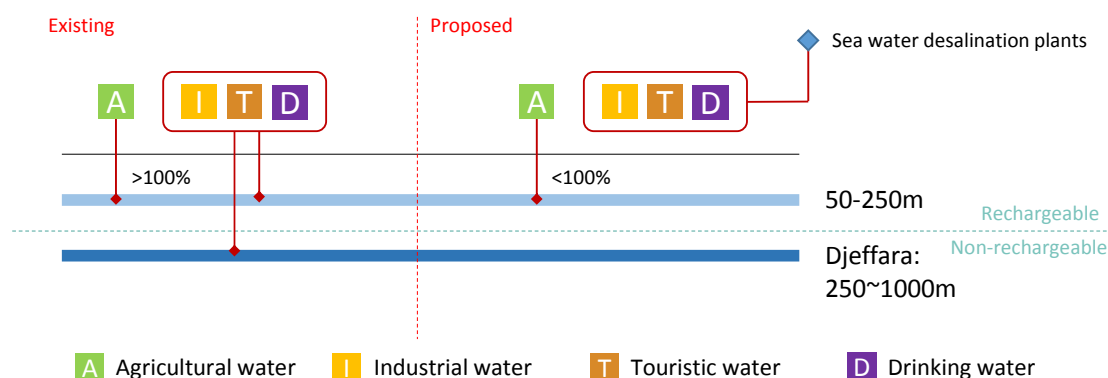


Figure 3.4-3 Simplified diagram of the switching in exploitation of groundwater resources in the South-East region in Tunisia.

(iii) Necessary shifting to a demand-oriented water management paradigm

Water shortages will inevitably shift the emphasis from supply management to demand management. This is particularly true for the agricultural sector which is by far the largest consumer. As the value of water increases, policies will be needed to ensure a rational use of water to increase productivity and profitability (more crop per drop; more dinars per drop) as well as maintaining a public service to supply essential domestic water supplies.⁵⁰

Water legislation will need to be better enforced than it is at present, particularly in the shallow groundwater areas exploited by the private sector. This will mean strengthening the capacity of Water User Associations. Improving the policing/inspection of groundwater use will also encourage the development of groundwater recharge to help offset the rising demand from the private sector.

⁵⁰ Rapport final objectif-cible 1 (MED 1-1), Priorité 1 : « Mieux gérer la demande en eau », Forum Mondial de l'Eau, 2012.

Another major concern is the age of professionals within the various organizations. Most were recruited in the 1970s and 80s and are coming up for retirement. This will leave a serious capacity gap that cannot easily be filled.

Deep groundwater will continue to be an increasingly important resource even though it is not being recharged. These deep fossil water resources are substantial but not limitless. Effective cooperation between Tunisia, Libya, and Algeria will be essential to ensure they are shared and managed to the benefit of all. The planned decentralization of water management will need to take account of this issue as it will be a national issue and not just the concerns of local governorates.⁵¹

(2) Strategies and Plans

Based on the analysis on the current situation, the following strategies and plans are proposed. The common objective of these strategies is to guarantee the sustainable use and management of ground water resources. In order to fulfil this vast and long-term objective, there is need to combine different kinds of tools, not only limited to water table conservation strategies. Indeed, various financial and technologic incentives and development strategies aimed at players of the economic sectors, including agriculture, should be developed.

In the perspective of decentralization, the combination of those various tools can be both the subject and motivation of creations of "local communities of actors" who can take the initiative to develop such instruments for sustainable management of vast agriculture-aquifer-soil systems.

Table 3.4-1 Strategies for sustainable groundwater resources use and management

Code	Strategy	Effect (Direct / Indirect)	Indicator
WM-1	Strengthen groundwater resource planning and protection	Acquisition of knowledge on the demand, rationalization of water resources exploitation on the long-term leading to the limitation of water resource depletion.	<ul style="list-style-type: none"> - Share of farmers to accept the field survey visit and to answer to the questionnaire - Evolution of the frequency of annual updates of the SASS GIS - Number of created CSPRH (Commission Sectorielle Permanente des Ressources Hydrauliques, permanent sectorial commission on hydraulic resources) and formulated PDARIRE (Plans Directeurs d'Aménagement Régional Intégré des Ressources en Eau, Integrated Water Resource Regional Master Plan)
WM-2	Reinforce groundwater abstraction control	Limit abstractions of groundwater water tables, participate in the limitation of overexploitation of underground aquifers and thus in the avoidance of water resource depletion.	<ul style="list-style-type: none"> - Evolution of the number of permits issued yearly on the new legal system and of the share of water charge collected yearly - Evolution of the share of wells equipped with metering instruments
WM-3	Ensure social sustainability of non-rechargeable ground water management	Preservation of social well-being and livelihoods for communities mostly dependent on a non-rechargeable resource while maintaining an equitable inter-generational distribution of benefits, and thus promoting the social transition to a less water-dependent economy.	<ul style="list-style-type: none"> - Establishment of innovative local planning tools related to water usage at the horizon 2025 - Evolution of the number of "decentralized management units" and "user association" created

Objectives, direct/indirect effect and indicators of each of the strategies are described below:

⁵¹ *Groundwater Management in Tunisia*, FAO, Rome, 2009.

(a) WM-1: Strengthen groundwater resource planning and protection

(i) Objective of the strategy

The planning for the mobilization water resource aims at achieving the best possible match between water demand, current and future, and the resources available in quantity and quality, balance and harmonize the regional and local development and streamline the procedures in accordance with the requirements of the environment.⁵² The main objective of this strategy is to improve the planning capacity of groundwater resource, especially through the reinforcement of legal and institutional framework with enhanced acquisition and accessibility of knowledge and information.

(ii) Direct/indirect effect

Through implementation of this strategy, the important knowledge related to the water usage will be acquired for a better understanding of the demand leading to the constitution of a relevant baseline information for planning of the future supply. In addition, the rationalization of water resources exploitation on the long-term leading to the limitation of groundwater depletion can be forecasted.

(iii) Indicators

- Share of farmers to accept the field survey visit and to answer to the questionnaire on the total number of farms using irrigation on a 5-year span;
- Evolution of the frequency of annual updates of the SASS GIS system on a 5-year span
- Number of CSPRH created in the 6 Southern Tunisian governorates at the horizon 2035
- Number of PDARIRE plans conducted in Southern Tunisia at the horizon 2035

(b) WM-2: Reinforce groundwater abstraction control

(i) Objective of the strategy

A high priority should be given to the strengthening of groundwater abstraction granting system (permits, licenses, concessions, etc.) and water tariff system. These tools must be consistent with the hydrogeological reality of the aquifers (continuously lowered groundwater levels, potentially decreasing well yields and possibly deteriorated groundwater quality, etc.) which have to be measured scientifically through the introduction of performant metering instruments.

(ii) Direct/indirect effect

Through implementation of this strategy, the limitation of abstractions of groundwater water tables, the participation in the limitation of overexploitation of underground aquifers and thus in the avoidance of water resource depletion can be forecasted.

(iii) Indicators

- Evolution of the number of permits issued yearly on the new legal system on a 5-year span
- Evolution of the share of water charge collected yearly on the total of farms on a 5-year span
- Evolution of the share of wells equipped with metering instruments on the total number of wells on a 5-year span

⁵² Etude de révision et d'amendement du code des eaux, DGRE/Centre National d'Etudes Agricoles, 2012.

(c) WM-3: Ensure social sustainability of non-rechargeable ground water management

(i) Objective of the strategy

Considering that sustainable development is not restricted to the sustainability of the water resource itself, but is also dependent to the socio-economic aspects, the main objective of this strategy is to improve social sustainability of non-rechargeable groundwater management. This can be done by ensuring local participation, protecting cultural values, lifestyles, and customary groundwater users, and by giving importance inter-generational equity.

In addition, a long-term objective of the strategy is to change the exploitation logic and to promote the social transition to a less water-dependent economy with the collective perspective of an “exit scenario” answering the question of “what comes after the aquifer is seriously depleted”.⁵³

(ii) Direct/indirect effect

Through implementation of this strategy, the preservation of social well-being and livelihoods for communities mostly dependent on a non-rechargeable resource will be enhanced. In addition, while maintaining an equitable inter-generational distribution of benefits, the social transition to a less water-dependent economy will be promoted.

(iii) Indicators

- Success of the pilot-project for establishment of innovative local planning tools of protection of local cultural values and lifestyles related to water usage at the horizon 2025
- Evolution of the number of “decentralized management units” created on a 5-year span
- Evolution of the number of “user associations” created on a 5-year span

(3) Plans and action plans

Plans and action plans for the strategies are described below.

⁵³ Loucks Daniel, *Non-rechargeable groundwater resources: a guidebook on socially-sustainable management for water-policy makers*, UNESCO, World Bank, 2006.

Cross-cutting issue	Strategy	WM-1	Strengthen groundwater resource planning and protection		
	Plan		Actions	Term	Cost
Sustainable water resource management	WM-1-1: Development of demand-oriented socio-economic knowledge		<ul style="list-style-type: none"> - Organize meetings with various stakeholders in order to identify the sites where the surveys should be done - Conduct field surveys and visits to farms for broad material collection on farming system - Diffuse questionnaires to famers in order to collect precise details on specific farming behaviour 	Short-term	-
	WM-1-2: Improvement and accessibility of the Geographical Information System (GIS)		<ul style="list-style-type: none"> - Establish a mechanism of maintenance of the GIS system - Improve knowledge of the GIS system and of its exploitation at regional scale through trainings 	Short-term	-
	WM-1-3: Improvement of inter-institutional and inter-sectorial coordination on water resource issue through the establishment of CSPRH		<ul style="list-style-type: none"> - Improve political consensus-making process regarding the creation of the CSPRH in Southern governorates - Ensure capacity development of CSPRH human resources through professional training - Make the modernization of water information and management tools of the CSPRH 	Mid-term	-
	WM-1-4: Reinforcement of the legal framework of regional groundwater resource planning through the adoption of PDARIRE		<ul style="list-style-type: none"> - Accelerate the adoption of the legal framework (decree) of establishment of PDARIRE - Mobilize relevant stakeholders in both South-West and Southeast regions for establishing a Steering Committee of the PDARIRE - Mobilize international and national consultants for drafting the PDARIRE within a participatory approach with local beneficiaries 	Mid / Long-term	-

Source: JET

Strategy	WM-1	Strengthen groundwater resource planning and protection		
Plan	WM-1-1	Development of demand-oriented socio-economic knowledge		
Intervention Area	All over the Southern Region		Implementing agency	ODS / OSS
Description				
In order to guarantee a long-term planning based on the reality of the current water resource exploitation, an analysis of the demand in water should be operated. Most of the existing studies on groundwater resources focused mainly on the aquifer's functioning, chemical characteristics and its evolution in terms of volume, but rarely on water usage. In order to evaluate the impacts of human action on the aquifer's sustainability, it is important to collect detailed and accurate information about the behaviour of the primary user of this resource, namely farmers.				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Organize meetings with various stakeholders in order to identify the sites where the environmental and socioeconomic surveys should be done - Conduct field surveys and visits to farms for broad material collection on farming system - Diffuse questionnaires to famers to collect precise details on specific farming behaviour 		<ul style="list-style-type: none"> - ODS - OSS - GDA - Consultants 		<ul style="list-style-type: none"> - ODS ensures project management and coordination between various institutions and stakeholders by organizing relevant meetings - OSS and consultants carry out all the technical aspects - GDA facilitates the contact with local farmers and ensures the project ownership
Indicator			Risk	
<ul style="list-style-type: none"> - Share of farmers to accept the field survey visit and to answer to the questionnaire on the total number of farms using irrigation on a 5-year span 			<ul style="list-style-type: none"> - Farmers might not understand the merit of the operation and might show resistance in accepting the field survey and the questionnaires 	

Source: JET

Strategy	WM-1	Strengthen groundwater resource planning and protection		
Plan	WM-1-2	Improvement and accessibility of the Geographical Information System (GIS)		
Intervention Area	Southern Tunisia in collaboration with Algeria and Libya (SASS)		Implementing agency	OSS
Description				
In order to ensure a performant tool for planning on groundwater resources, the existing Geographical Information System (GIS) established during the two first phases of the SASS project on the SASS region should be improved. Indeed, there is a need in establishing a mechanism of maintenance and of permanent updating of the information. Also, the GIS system should be made accessible not only from national organizations, but also shared to the regional levels which are concerned by the exploitation of the SASS resources.				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Establish a mechanism of maintenance of the SASS GIS system - Improve knowledge of the GIS system and of its exploitation at regional scale through trainings 		<ul style="list-style-type: none"> - OSS - CSPRH (if created) - CRDA (if CSPRH not created) - Consultants 		<ul style="list-style-type: none"> - OSS carries out all the technical aspects related to the maintenance of GIS system - Consultants study the feasibility of introduction of the GIS platform in CSPRH (if created), or CRDA (if CSPRH not created)
Indicator			Risk	
<ul style="list-style-type: none"> - Evolution of the frequency of annual updates of the SASS GIS system on a 5-year span 			<ul style="list-style-type: none"> - There might be a lack of technological and human capacity in the CRDA for the introduction and the exploitation of a GIS platform 	

Source: JET

Strategy	WM-1	Strengthen groundwater resource planning and protection		
Plan	WM-1-3	Improvement of inter-institutional and inter-sectorial coordination on water resource issue through the establishment of CSPRH		
Intervention Area	All over the Southern Region		Implementing agency	MARH / ODS
Description				
<p>The efforts of inter-institutional and inter-sectorial coordination, as notified in the project for revision and amendment of the Water Code in 2012, will be strengthened, especially through the creation and the capacity development of the permanent sectorial commission on hydraulic resources (CSPRH: Commission Sectorielle Permanente des Ressources Hydrauliques) in the regional councils (Conseils Régionaux) of the 6 governorates of South Tunisia.</p> <p>The missions of the CSPRH to be created are to (i) review and monitor water use and management plans related to the perimeter of the governorate, (ii) control the situation of water resources in the governorate and implement various programs and related projects, and (iii) monitor objectives set for the water sector in particular in conservation and exploitation plans.</p>				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Improve political consensus-making process regarding the creation of the CSPRH in Southern governorates - Ensure capacity development of CSPRH human resources through professional training - Make the modernization of water information and management tools of the CSPRH 		<ul style="list-style-type: none"> - MARH - ODS - CSRH (Conseil Supérieur des Ressources Hydrauliques) - Conseil Régional 		<ul style="list-style-type: none"> - MARH ensures project management and coordination between various institutions at the national scale - ODS ensures project follow-up and coordination between various institutions at the regional scale - CSRH carries out establishment and capacity development of CSPRH
Indicator			Risk	
<ul style="list-style-type: none"> - Number of CSPRH created in the 6 Southern Tunisian governorates at the horizon 2035 			<ul style="list-style-type: none"> - Delays in the adoption of Water Code, decentralization process and general administrative burden might make difficult the establishment of the CSPRH 	

Source: JET

Strategy	WM-1	Strengthen groundwater resource planning and protection	
Plan	WM-1-4	Reinforcement of the legal framework of regional groundwater resource planning through the adoption of PDARIRE	
Intervention Area	All over the Southern Region	Implementing agency	MARH / MDCI
Description			
<p>The legal framework of the regional groundwater resource planning of Southern Tunisia will be improved by the preparation of the Integrated Water Resource Regional Master Plan (PDARIRE: Plans Directeurs d'Aménagement Régional Intégré des Ressources en Eau) for 20 years, as described in the project for revision and amendment of the Water Code in 2012, of the two great hydraulic regions of South-west and South-east.</p> <p>PDARIRE aims at defining water resource management modalities of the great hydraulic region in order to meet quantity and quality of current and future water needs of the various social, economic and environmental uses of the area, while ensuring quantitative and qualitative protection of resources, water-saving and recycling.</p>			
Action Plan			
Actions		Relevant organizations	Role
<ul style="list-style-type: none"> - Accelerate the adoption of the legal framework (decree) of establishment of PDARIRE 		<ul style="list-style-type: none"> - MARH - MDCI 	<ul style="list-style-type: none"> - MARH carries out the legal procedures and with MDCI, foster the political acceptance
<ul style="list-style-type: none"> - Mobilize relevant stakeholders in both South-West and Southeast regions for establishing a Steering Committee of the PDARIRE 		<ul style="list-style-type: none"> - ODS - CSPRH (if created) - CRDA (if CSPRH not created) - Consultants 	<ul style="list-style-type: none"> - ODS ensures project management and coordination between various institutions - Consultants in collaboration with CSPRH (if created), or CRDA (if CSPRH not created) draft the PDARIRE
<ul style="list-style-type: none"> - Mobilize international and national consultants for drafting the PDARIRE within a participatory approach with local beneficiaries 			
Indicator		Risk	
<ul style="list-style-type: none"> - Number of PDARIRE plans conducted in Southern Tunisia at the horizon 2035 		<ul style="list-style-type: none"> - Delays in the adoption of Water Code, decentralization process and general administrative burden might make difficult the launching of the PDARIRE 	

Source: JET

Cross-cutting issue	Strategy	WM-2	Reinforce groundwater abstraction control		
	Plan	Actions		Term	Cost
Sustainable water resource management	WM-2-1: Reinforce abstraction permit and well registration system	<ul style="list-style-type: none"> - Instigate time-limited permits subject to periodic review (5 to 10 years) - Limit issue of permits to users who have a water resource management plan or a water-saving strategy - Establish an order of priority for issuing permits, giving priority to drilling for livestock and high value-added crops 		Short term	-
	WM-2-2: Improve water charge system	<ul style="list-style-type: none"> - Evaluation of possible costs including fixed and variable operational costs of GDAs - Study on a method of collection of water charge including the possibility of integrating it in electricity bill - Implement the new water charge collection system 		Short term	-
	WM-2-3: Impose the metering of wells	<ul style="list-style-type: none"> - On the basis of the SASS database of boreholes established in 2000 by OSS, identify the existing wells - Study the technical and financial feasibility including cooperation of international donors - Equip the new wells with flow measurement instruments 		Mid term	-

Source: JET

Strategy	WM-2	Reinforce groundwater abstraction control		
Plan	WM-2-1	Reinforce abstraction permit and well registration system		
Intervention Area	All over the Southern Region	Implementing agency	MARH	
Description				
In order to enable the water administration to control groundwater abstraction, the strengthening of the permit and water rights system is one of the key-solution. The permit system may cover groundwater exploitation, well construction and drilling authorization. The terms and conditions for applying the permit are set for (i) volume, rate and period of abstraction, (ii) location of drilling or well, and (iii) modalities of abstraction and use, including water-saving strategies.				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Instigate time-limited permits subject to periodic review (5 to 10 years) in order to be consistent with the hydrogeological reality of continuously-declining groundwater levels and to stimulate permit holders to provide regular data on wells - Limit issuance of permits to users who have a water resource management plan or a water-saving strategy (to be elaborated together with local GDAs) - Establish an order of priority for issuing permits, giving priority to drilling for livestock and high value-added crops 		<ul style="list-style-type: none"> - MARH - CSPRH (if created) - CRDA (if CSPRH not created) - GDA 		<ul style="list-style-type: none"> - MARH ensures the reform of the legal framework for permit validity period, permit issuing conditions etc. - CSPRH (if created) or CRDA (if CSPRH not created) takes the responsibility for the implementation of the reform and for the control of the process - GDA ensure a support to water users for elaborating water resource management plans and a water-saving strategies
Indicator			Risk	
<ul style="list-style-type: none"> - Evolution of the number of permits issued yearly on the new legal system on a 5-year span 			<ul style="list-style-type: none"> - There might be difficulties in implementing this legal decision in the reality 	

Source: JET

Strategy	WM-2	Reinforce groundwater abstraction control	
Plan	WM-2-2	Improve water charge system	
Intervention Area	All over the Southern Region	Implementing agency	CSPRH - CRDA
Description			
<p>One option that would allow a better control of the pressure on the resource would be to establish a water charge system that incorporates the actual cost of mobilization as well as the utilization of the water resource. A serious evaluation of the various possible expected costs should be done preliminary. A gradual pricing mechanism that would guarantee a genuine conservation of the resource should be integrated:</p> <ul style="list-style-type: none"> - Direct costs of daily operation; - Investment costs; - Fixed and variable operational costs of GDA; - Indirect costs, especially the costs of environmental degradation; - Resource scarcity costs (non-rechargeable groundwater is not free). 			
Action Plan			
Actions		Relevant organizations	Role
<ul style="list-style-type: none"> - Evaluation of possible costs including fixed and variable operational costs of GDAs 		<ul style="list-style-type: none"> - MARH - CSPRH (if created) - CRDA (if CSPRH not created) - GDA 	<ul style="list-style-type: none"> - MARH carries out the study on new tariff calculation and collection system in collaboration with CRDA - CSPRH (if created) or CRDA (if CSPRH not created) carries out the implementation of the new water charge collection system - GDA ensure the cooperation with farmers for a smooth implementation of the system
<ul style="list-style-type: none"> - Study on a method of collection of water charge including the possibility of integrating it in electricity bill 			
<ul style="list-style-type: none"> - Implement the new water charge collection system 			
Indicator		Risk	
<ul style="list-style-type: none"> - Evolution of the share of water charge collected yearly on the total of farms on a 5-year span 		<ul style="list-style-type: none"> - There might be difficulties in implementing this legal decision in the reality ; - Water users might show opposition to the water charge collection. 	

Source: JET

Strategy	WM-2	Reinforce groundwater abstraction control	
Plan	WM-2-3	Impose the metering of wells	
Intervention Area	All over the Southern Region	Implementing agency	MARH / OSS
Description			
In the perspective of the reinforcement of groundwater abstraction control, this plan aims at imposing the installation of measurement instruments on most of the wells possible. The metering of wells will allow to (i) quantify the amount of water extracted and to (ii) charge the users accordingly. Farmers may find that water meters can be helpful in operating a more cost effective business and also detecting pump inefficiencies etc.			
Action Plan			
Actions		Relevant organizations	Role
- On the basis of the SASS database of boreholes established in 2000 by OSS, identify the existing wells		- OSS	- OSS carries out the analysis of the data
- Study the technical and financial feasibility including cooperation of international donors		- MARH - Consultants	- Consultants and MARH study the technical and financial feasibility of introduction of water metering instruments
- Equip the new wells with flow measurement instruments		- CSPRH (if created) - CRDA (if CSPRH not created) - GDA	- CSPRH (if created) or CRDA (if CSPRH not created) assist GDA in the implementation of the campaign of installation of metering equipment
Indicator		Risk	
- Evolution of the share of wells equipped with metering instruments on the total number of wells on a 5-year span		- There might be difficulties in implementing the legal tools in the reality; - Farmers might show opposition to the reinforcement of the control of the water flow of their wells.	

Source: JET

Cross-cutting issue	Strategy	WM-3	Ensure social sustainability of non-rechargeable ground water management		
	Plan		Actions	Term	Cost
Sustainable water resource management	WM-3-1: Maintain and improve social well-being of communities through secured water access and consideration of cultural values		<ul style="list-style-type: none"> - Conduct field surveys in order to identify local cultural values, lifestyles, and customary groundwater users - Make the inventory of the ecological services provided by the aquifer system - Protect local cultural values and lifestyles related to water usage through innovative local planning tools 	Mid term	-
	WM-3-2: Promote equitable and effective decision-making through participation		<ul style="list-style-type: none"> - Perform broad stakeholder analysis in order to identify all the beneficiaries in local administration, private sector and civil society - Study the possibility of establishing “decentralized management units” at the level of all the watersheds of Southern Tunisia - Study the possibility of establishing “user associations” in Southern Tunisia 	Mid term	-
	WM-3-3: Maintain and improve inter-generational equity		<ul style="list-style-type: none"> - Enhance “social capital” through collective activities that make evolve the capacity of stakeholders to cooperate effectively on resource utilisation - Promote the outbreak of opportunities to younger generations created by technology breakthroughs that positively impact on the water supply 	Long term	-

Source: JET

Strategy	WM-3	Ensure social sustainability of non-rechargeable ground water management	
Plan	WM-3-1	Maintain and improve social well-being of communities through secured water access and consideration of cultural values	
Intervention Area	All over the Southern Region	Implementing agency	CSPRH – CRDA / OSS
Description			
In order to ensure social sustainability of the communities whose livelihood is based on non-rechargeable water resources, the maintenance and improvement of social well-being is a prerequisite. It can be realized by meeting as far as possible the social, economic, cultural and environmental needs of those communities, now and in the future. Thus, even if abstraction has to be controlled (refer to Strategy WM-2), the access to water supply has to be secured.			
Action Plan			
Actions		Relevant organizations	Role
<ul style="list-style-type: none"> - Conduct field surveys in order to identify spatially and sociologically local cultural values and lifestyles, and customary groundwater users - Make the inventory of the ecological services provided by the aquifer system - Protect local cultural values and lifestyles related to water usage through innovative local planning tools even if this needs to be reconciled with the need to promote economic transformation as regards reduced dependency on scarce water resources through the promotion of high added-value activities 		<ul style="list-style-type: none"> - OSS - CSPRH (if created) - CRDA (if CSPRH not created) - GDA - Consultants 	<ul style="list-style-type: none"> - OSS and consultants carry out all the technical aspects of field survey and analysis of local cultural values and lifestyles related to water usage and ecological services provided by the aquifer - CSPRH (if created) or CRDA (if CSPRH not created) ensure the implementation and the follow-up of the pilot-project for the innovative plan
Indicator		Risk	
<ul style="list-style-type: none"> - Success of the pilot-project for establishment of innovative local planning tools of protection of local cultural values and lifestyles related to water usage at the horizon 2025 			

Source: JET

Strategy	WM-3	Ensure social sustainability of non-rechargeable ground water management		
Plan	WM-3-2	Promote just and effective decision-making through participation		
Intervention Area	All over the Southern Region	Implementing agency	ODS / CSPRH – CRDA	
Description				
In order to ensure social sustainability of the local communities, there is a necessity of promoting the right of communities to participate meaningfully in groundwater use decisions affecting livelihoods. The approach based on the intervention of “water police” should be avoided and replaced by the search for auto-control at the local level. Thus, there is a need for equitable and effective mechanisms for participation in decision-making during planning and implementation, conflict resolution, distribution of benefits/responsibilities/incentives and compensation for damages resulting from groundwater exploitation.				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Perform broad stakeholder analysis in order to identify all the beneficiaries in local administration, private sector and civil society - Study the possibility of establishing “Decentralized Management Units (DMU)” at the level of all the watersheds of Southern Tunisia - Study the possibility of establishing “User Associations (UA)” in Southern Tunisia 		<ul style="list-style-type: none"> - ODS - CSPRH (if created) - CRDA (if CSPRH not created) - Consultants - Groups of farmers 		<ul style="list-style-type: none"> - ODS ensures project management and coordination between various institutions and stakeholders by organizing relevant meetings - Consultants in collaboration with CSPRH (if created) or CRDA (if CSPRH not created) study the institutional feasibility of establishing DMU and UA
Indicator			Risk	
<ul style="list-style-type: none"> - Evolution of the number of “decentralized management units” created on a 5-year span - Evolution of the number of “user associations” created on a 5-year span 			<ul style="list-style-type: none"> - There might be a reaction of resistance from the farmers to integrate associations - Delays in the decentralization process and general administrative burden might delay the process 	

Source: JET

Strategy	WM-3	Ensure social sustainability of non-rechargeable ground water management		
Plan	WM-3-3	Maintain and improve inter-generational equity		
Intervention Area	All over the Southern Region		Implementing agency	ODS / CSPRH - CRDA
Description				
The social sustainability should be guaranteed by not only the human survival of present and future generations, but also by maintaining inter-generational equity in terms of benefits derived from the resource and ensure economic and social opportunities to all stakeholder groups.				
Action Plan				
Actions		Relevant organizations		Role
<ul style="list-style-type: none"> - Enhance “social capital” through collective activities that make evolve the capacity of stakeholders to cooperate effectively on resource utilisation 		<ul style="list-style-type: none"> - CSPRH (if created) - CRDA (if CSPRH not created) 		<ul style="list-style-type: none"> - CSPRH (if created) or CRDA (if CSPRH not created) takes the initiative of promotion of awareness through farmers for more cooperative works between generations
<ul style="list-style-type: none"> - Promote the outbreak of opportunities to younger generations created by technology breakthroughs that positively impact on the water supply (for example reducing desalinated water cost and environment impact) 		<ul style="list-style-type: none"> - ODS 		<ul style="list-style-type: none"> - ODS carries out various activities to foster the technological innovation and the competitiveness through young engineers
Indicator		Risk		
Difficult to quantify		<ul style="list-style-type: none"> - There might be a reaction of resistance from the older farmers to share the knowledge and from the younger farmers to be inclined to learn from the elderly 		

3.4.2 Investment, Marketing, and Trade Promotion

(1) Summary of an analysis of current conditions⁵⁴

(a) Investment

Capital investment, especially foreign direct investment (FDI), has strategic implications for Tunisia's economic growth as it contributes to a significant portion of the government budget, representing up to 10% of its productive investments, one-third of exports, and one-sixth of total employment. FDI also plays a pivotal role in inducing the transfer of knowledge and technology and in introducing managerial and operational expertise and practices, which, in turn, help raise local business competitiveness.

However, the government retains close control of many sectors, the performance of which have considerable ramifications for economic development, and private and foreign capital face widespread entry barriers. Sectors with pervasive government intervention include infrastructure (electricity, water, telecoms, road and air transport, and the railways), tourism, fisheries, agricultural extension services, vocational and professional training, retail and distribution, and real estate⁵⁵. Over 50% of the Tunisian economy suffers from investment restrictions, whether through the Investment Incentives Code, the Competition Law, or specific sectoral legislation. The Investment Incentives Code, which is centred on two regimes, "offshore" and "onshore," has generated an unintended inclination toward a low-productivity and low value-added industry base as well as limited results in terms of attracting additional investment and job creation. Meanwhile, regulations that govern land markets and labour markets and the practice of industry-wide collective agreements have inadvertently contributed to discourage investments in Tunisia⁵⁶.

While the southern region possesses important factors to attract investment—such as the presence of valuable resources ranging from tourism assets (e.g., beaches, sceneries, ruins, and an intangible cultural heritage) to agricultural and mineral resources; human capital; favourable financial and economic incentives granted for being a disadvantaged region within the country⁵⁷; demarcated economic and industrial zones; and several research institutes, including a specialized one such as the IRA—the overall capital inflow to Tunisia has been highly skewed toward the northern region and central coastal area. Investments in the southern region have been limited both in volume and in scope⁵⁸.

Such trends have been largely explained by the sustained deficits in infrastructure in the southern region compared to the northern and coastal regions in terms of transport (land and maritime) networks and measures, logistics services, livelihood, and necessary element to ensure a comfortable lifestyle for residents (e.g., schools, entertainment options, and hospitals), which are deemed essential to attract

⁵⁴ This report has been constructed from the previously published Inception Report and Progress Report, which contain background information and analysis.

⁵⁵ Between 50 to 100% of the gas, electricity, railroad transport, air transport, and landline telecommunication services markets have been seized by state-owned enterprises.

⁵⁶ Property registration and transactional costs in Tunisia are relatively high. The Tunisian labor market regulations pose high costs for the termination of open-ended contracts and flexible short fixed-term contracts (both contract forms being more suited for high-skilled jobs), thereby creating more jobs for low-skilled or informal positions. In particular, the industry-wide collective agreements hamper the competitiveness of the interior regions because the application of the same pay scales across different regions may undermine the attractiveness of the interior regions from investors' cost perspective.

⁵⁷ Regional development encouragement in alignment with the Investment Incentives Code, which has been under review for the preparation of a new investment law.

⁵⁸ See the Progress Report for more data and analysis.

investment projects. Another explanatory factor is the weak institutional capacity of the decision-making and planning bodies to conduct development planning and define regional strategic focuses based on the region's existing assets, comparative advantages, and competitive positioning in the broader context of the economy. In addition, the public investment promotion agencies decentralized at governorate level, including APIA (for agriculture) and APII (for industry) as well as associated banks such as BTS (social), BFPME (for small- and medium-sized enterprises), and SICAR/SODIS (for risk capital), are not functioning effectively to concretize investment opportunities. Moreover, technical issues exist, such as poor quality of the investment project proposals by investors, in addition to administrative and managerial issues, resulting in a lack of effective follow-up and coordination among the aforementioned stakeholders to create an effective platform to encourage investments and demonstrate the region's viabilities.

While the ongoing reform (under discussion between the Tunisian government and the IMF) of laws and regulations framed under the Investment Incentives Code and of related laws such as the Competition Law and taxation laws, among others, are expected to help improve the investment climate of the country, the government will still need to take separate steps to make the southern region an attractive destination to invest in.

(b) Marketing

Marketing is highly relevant in regional development planning particularly in two aspects: one is the marketing of agricultural products that are strategically significant to the southern region⁵⁹; and the other is the marketing of the southern region as a prominent destination for capital investments.

(i) Agricultural products

Olives and dates are Tunisia's major exportable goods and have strong value-adding potential⁶⁰. These sub-sectors also have socioeconomic consequences for the region given their prevalence in the local economy, particularly olives in Gafsa and Médenine and dates in Kébili and Tozeur. The value-add of olive oil has led the Tunisian government to execute a national marketing program called the National Olive Program. Under this program, a common objective shared by the public and private sectors has been pursued—increasing the competitiveness of Tunisian olives in the international market and the exports of value-added products. Moreover, the bottling and exporting companies jointly execute a growth strategy based on international market trends and set benchmarks. This approach has proved effective over the past few years as these companies have achieved their annual export targets (i.e., the share of bottled olive oil products out of total olive oil exports) as well as realized the diversification of export destinations. Presently, non-traditional markets such as Russia, China, and the Americas are important trading partners. Currently, only one company from Tunisia's southern region participates in the National Olive Program.

A few aspects should be taken into account for the marketing of olives. Several scientific studies conducted by national research institutions and in partnership with the JICA project have reported a high content of beneficial bio-components in the traditional varieties of olives cultivated in southern Tunisia. This fact opens up possibilities for the relevant stakeholders to define unique value propositions for

⁵⁹ The marketing of other principal products and services such as tourism, industrial products, and handicrafts is referred to in a corresponding section of the report.

⁶⁰ See the details in the Agriculture and Agricultural Processing section of the report.

different market segments (e.g., health, beauty, and medical). Another measure that should be explored is the application of production and processing certificates such as the Controlled Designation of Origin (l'Appellation d'Origine Contrôlée: AOC in French) and the Indication of Origin (l'Indication de Provenance: IP in French) to the olive sub-sector for shedding light on its quality attributes and for brand-building purposes. The certification system is still incipient and limited in Tunisia; only wines produced in the northern region and figs produced in Djebba are being commercialized under the AOC. Likewise, organic production is another approach for value addition that remains largely underexploited by south Tunisian producers, processors, and exporters.

As regards dates, a collective marketing approach is almost nonexistent. GIFruits, an entity constituted by public and private sector representatives and organized by product category, takes the lead in market research, technical assistance for production, and distribution of production supplies (i.e., nets) for quality control. GIFruits has decentralized offices including one in Tozeur, where production and export data are regularly collected. The dates sub-sector also has a few research institutions in the south, including the IRA and the Technical Centre of Dates. However, their focus is more on improving production techniques or value addition to by-products (date seeds as coffee and handicrafts) and less on value addition to the processed date fruits for commercialization as a more diverse final consumer product (e.g., in the domains of beauty and cosmetic products, nutritional products for special medical purposes, or intensive sports and leisure) or as a value-added agrifood ingredient. The research results that highlight the benefits of dates, such as their high fiber and vitamin content and substitutability for sugar for diabetes patients, are underutilized to add value to products and their marketing, except by a few micro and small-scale food-processing businesses. In sum, despite the concentrated presence of stakeholders in different interrelated fields (production, research, and processing/exporting) in the region, unlike in the case of olive oil, there is a lack of an orchestrated marketing initiative in the dates sub-sectors.

In essence, both sub-sectors possess highly significant potential with unexploited value propositions to offer, and stakeholders in these sectors can build up further market intelligence to strengthen product innovations, value-addition, and sales promotion.

(ii) Investment promotion

The marketing approach to the investment promotion of the southern region has been weak. Currently, FIPA is responsible for encouraging foreign investments in Tunisia, while API attends to wider segments of potential investors for any firm (with at least 10 workers). As mentioned in the previous section of the investment, the value proposition and positioning of the southern region as an attractive destination for capital investment remain inexplicitly defined and are thus weakly communicated outside the region. Different values and competitiveness offered by each governorate and/or in some collective manner by the six governorates, need to be better defined so that potential investment opportunities can be effectively promoted. Doing so would require further public consultation and concrete political decision making and planning to clarify the regional vision and priorities. In other words, in the absence of those factors, it will be difficult to effectively promote investments to facilitate sustainable growth in the region.

(c) Trade Promotion

Tunisia's trade environment is characterized by relatively higher average tariffs and a lower degree of trade freedom in comparison with comparator countries in the MENA region and other countries with the same income level⁶¹. Its top-five trade partners in terms of export value are France (26.2%), Italy (16.0%), Germany (9.4%), Libya (7.6%), and the USA (4.3%); over 50% of its exports are to three EU member countries. Tunisia's export trends can be mostly explained by (i) the impact of the global economic downturn since 2008 and particularly of the Eurozone; (ii) a lack of investment in regional infrastructure by successive governorates and the central government; (iii) constricted financial policies of the major commercial lenders; (iv) low levels of private investor confidence in the region, which in turn has resulted in lower logistics competitiveness, with a few exceptions being coastal areas developed as competitive ports for specific sectors (Monastir for textiles, Sfax for ICT, and Bizerte for Agrofood); and (v) underutilization of export opportunities in agricultural sub-sectors (sheep and goat breeding, arboriculture, and horticulture) that have a comparative advantage, because of the absence of adequate agricultural policies to foster their potential.

Major exports from the southern region include agricultural products (dates, olives, and tomatoes), semi-finished goods (auto parts), phosphates and chemical products, and textiles. In addition, construction materials such as gypsum powder, red bricks, marble, and other precious stones constitute important exportable goods. In particular, construction materials are becoming increasingly important for the African markets, where the need for basic infrastructure investment is estimated to be around USD 100 billion per year⁶². The neighbouring country of Libya accounts for the major share of red bricks exported and these are transported over land. The export of gypsum powder and potentially primary processed gypsum (transformed into molds or boards) is expected to expand to not only Libya but also more diverse destinations in the African markets, implying the need for more efficient and cost-competitive logistics and transportation systems. Strong potential exists for the diversification of the export destinations of dates, as the demand in African and Asian countries having a considerable Muslim population is growing and so are their imports. As for olive oil, while bulk exports to Italy, Spain, and France remain substantial, the strategic marketing of value-added bottled products is paving the way for entry into markets such as Russia, China, and the Americas. The southern region currently has one company in Gafsa that exports bottled olive oil.

The principal constraints to the invigoration of exports of higher value-added goods out of the southern region are the insufficient transport infrastructure and the absence of logistics services. Upgrading transport infrastructure and the key transport links would allow for operations that are more efficient as well as contribute to the value-adding options for merchandise by reducing disadvantages caused by the distances from the major exporting ports of Rades and Sfax. The improved infrastructure will encourage high-value industry growth, relevant services, and investment in the region in the long term. However, it will require careful examination of the types and locations in which to invest.

Another issue is the prevalence of unregulated cross-border trading with Libya and Algeria, which inhibits sound export practices in the region. Commercial goods including household goods, food (fresh fruits and vegetables and processed foods), metals, and chemical elements are transported into and out of Libya, and cheap gasoline is being brought in from Algeria. In this regard, the central government is already planning to establish a border control force with a customs office in Ben Guerden, the nearest

⁶¹ See "trade environment and characteristics" in the Inception Report for more details.

⁶² KPMG (2013) Sector Report: Construction in Africa.

border town (between Tunisia and Libya) in the governorate of Médenine. Establishing a customs office and ensuring regulated transactions will open new business opportunities, particularly in the logistics services. A similar need is being recognized in another location near the border with Libya, in the governorate of Tataouine, although a concrete plan has not been expounded so far⁶³.

Besides the infrastructure and regulatory aspects, the southern region will require capacity building from a supporting institution, namely a Chamber of Commerce, so that they can encourage and assist local businesses to compete in the export markets. In the absence of CEPEX (the Centre for Export Promotions, i.e., “the national export promotion agency) in the region, except for a representative office in Gabès that has an extremely limited role, the Chamber of Commerce in each governorate has an important role to play.

(2) Strategies and plans

(a) IME-1: Investment Promotion

(i) Description of the Strategy

IME-1: Investment Promotion. To reinforce public sector initiatives for regional investment promotion by defining strategic focuses and by delivering clear messages of investment opportunities and performance.

Sector	Strategy	IME-1	To reinforce regional public sector led investment promotion		
	Plan		Actions	Term	Cost
Investment	Aggressive marketing of investment opportunities in the south region as attractive investment destination for internal and external investors.		-Preparation and publication of effective communication tool specifically for FDI promotion purpose. Develop a Regional Investment Prospectus for national and global markets to profile the infrastructure, commercial investment opportunities in the region. -Bringing in closer collaboration with FIPA -Launching on periodic promotional activities -Definition and implementation of “game changer” pilot projects -Design and establishment of regional special funds	Short to Medium	For promotion USD 163,000 (int’l and nat’l consultants fees, promotional materials, workshops; excluding promotional activities) For Pilot projects and Regional Funds USD 65,000 (int’l and nat’l consultants fees)
	2. Improvement of institutional capacities of ODS/DRD to attract and monitor investment projects.		Refer to Regional Planning Strategy		

⁶³ However, informal trade cannot be resolved simply by introducing more controls and sanctions. It exists due to complex reasons such as differences in the tax regimes between these countries that foster illegal trading, and the high economic dependency of local residents who earn a living through these relevant businesses.

(ii) Direct/Indirect Effects

- Stronger coordination among investment promotion agencies
- Investment growth
- Enhanced capacities to evaluate and implement proposed investment plan

(iii) Indicators

- Number of investment projects submitted
- Number of investment projects executed
- Value of investments made by national investors and by way of FDI
- Investment portfolio by sector (sub-sector)
- Schedule (number of days taken) for processing investment proposals: from submission of the idea and elaborated proposal to delivery of evaluation outcome and project initiation

(iv) Development Plan

<Institutional and Human Development Plan>

Short-term (2016–2020)

- Select and study “game changer” projects
- Elaborate the Regional Investment Prospectus
- Hold a regional investment forum and participation in other investment promotion activities
- Undertake needs assessment of capacity building of relevant institutions/agencies and training based on these needs

Mid-term (2021–2025)

- Revise and update the Regional Investment Prospectus
- Continue investment promotion activities
- Train personnel of relevant institutions/agencies continuously

<Facility and Infrastructure Development Plan>

- N.A.

<Financial and Investment Plan>

Short-term (2016–2020)

- Evaluate existing financial schemes available to the sector workers
- Promote investment in collaboration with the tourism sector

Mid-term (2021–2025)

- Operate (potential) grants and/or revolving funds to support microenterprises
- Promote investment in collaboration with the tourism sector

(b) IME-2: Marketing

(i) Description of the Strategy

IME-2: Marketing. To strengthen the marketing of regional specialty products (primarily, processed dates and olives) and services.

Sector	Strategy	IME-2	To Strengthen marketing of selected regional specialty products (principally processed dates and olives) and services		
	Plan		Actions	Term	Cost
Marketing	1. Improvement of market intelligence (market trends, strategic partnerships, etc.)		- Consolidation of market intelligence (market trend analysis, identification and formation of partnerships, etc.) - Management of market intelligence, including systematic dissemination and sharing of information for key players	Short to Medium	USD 113,500 (int'l and nat'l consultants fees)
	2. Development of promotional tools and improvement of promotional activities Frameworks – certificate,		- Formation of specialty products marketing committees which are to be held accountable for taking actions such as follows: ● Development of regional/product brands and certification system ● Resource mobilization (establishment of special funds for promotion, for example) ● Execution of promotional activities.	Short to Medium	USD 121,000 (int'l and nat'l consultants fees) (excluding promotional activities)
	3. Enhancement of market-driven research activities for product development and improvement for product/service differentiation		- Identification and organization of strategic partnership (including technopole and other research centres, design schools, relevant industries, Packtec, etc.) - R&D to identify/build-up unique attributes to be translated into new products offers.	Short to Medium	USD 47,500 (int'l and nat'l consultants fees)

(ii) Direct/Indirect Effects

- Stronger marketing intelligence of sub-sectors
- Development of effective marketing tools and brand equity
- Market-oriented R&D

(iii) Indicators

- Establishment of a collective marketing intelligence and committees for major products and their systematic updating and management
- Establishment of a certification system
- Product Added values
- Sub-sector growth measured by sales and export volumes and value

(iv) Development Plan

<Institutional and Human Development Plan>

Short-term (2016–2020)

- Hold round-table discussions with public and private stakeholders
- Form marketing committees based in the southern region
- Launch collective market intelligence
- Undertake research and offer technical assistance to develop an adequate certification system applicable to the target products
- Reorganize R&D orientation in alignment with the market intelligence

Mid-term (2021–2025)

- Continue with efforts to build collective market intelligence
- Build brand equity of sub-sector products
- Improve alignment between R&D and product development

<Facility and Infrastructure Development Plan>

- N.A.

<Financial and Investment Plan>

Short-term (2016–2020)

- Undertake a study on establishing a regional branding fund
- Conduct a feasibility study of revolving funds for promotional activities

Mid-term (2021–2025)

- Mobilize resources for collective promotional activities

(3) IME-3: Trade Promotion

(i) Description of the Strategy

IME-3: Trade Promotion. To promote export growth and diversification by upgrading transport infrastructure and logistics and by strengthening the exporting capacities of micro and small enterprises.

Sector	Strategy	IME-3	To promote export growth and diversification		
		Plan	Actions	Term	Cost
Trade	1. Creation of export friendly logistics and transport conditions in the South Region.		Refer to Infrastructure Strategy		
	2. Export promotion of micro and small enterprises		-Capacity building of micro and small enterprises in exporting business. -Institutional strengthening of chamber of commerce -Promotion of exportable goods	Short to Medium	USD 71,000 (international/national consultants fees)

(ii) Direct/Indirect Effects

- Micro and small enterprises have the necessary knowledge and skills for exporting
- More businesses export their products (and services)
- More detailed technical support becomes locally accessible

(iii) Indicators

- Increase in the number of exporters from the southern region
- Increase in the exporting value of major exportable goods
- Diversification of technical support provided by the local Chamber of Commerce

(iv) Development Plan

<Institutional and Human Development Plan>

Short-term (2016–2020)

- Conduct a rapid appraisal of the exporting practices of micro and small enterprises in the southern region
- Undertake needs assessment of export-oriented capacity building
- Facilitate capacity building of potential/interested micro and small enterprises
- Ensure institutional strengthening of CEPEX and the Chambers of Commerce

Mid-term (2021–2025)

- Continue capacity building as needed

<Facility and Infrastructure Development Plan>

See Infrastructure Strategy Section

<Financial and Investment Plan (excluding infrastructure-related parts)>

Short-term (2016–2020)

- Undertake rapid appraisal of collaboration with ongoing technical assistance programs/projects to cover SMEs in the southern region
- Mobilize resources to secure the financing of export promotion activities of south-based SMEs in a collective manner

Mid-term (2021–2025)

- Establish a regional export promotion financing mechanism

Strategy	IME-1	Reinforcement of public sector initiatives for regional investment promotion	
Plan	IME-1-1	Effective promotion of south region as attractive investment destination for internal and external investors	
Intervention Area	Six governorates	Implementing agency	ODS
Description			
<p>Potential foreign investors largely rely on the information made available by the FIPA. Current FDI promotion strategy covers the regional competitiveness in an equal manner, and disseminates only basic information. In order to draw attention of the potential investors to the region, it is essential to shed light on the unique benefits that south region governorates offer individually or collectively.</p> <p>The proposed plan aims to effectively communicate distinctive attributes and comparative advantages that the south region can offer to potential investors by highlighting exemplary concrete project ideas and providing tailored information in the Regional Investment Prospectus. .</p> <p>Successful execution of the plan would require strong leadership and commitment by the ODS.</p>			
Action Plan			
Action	Relevant organizations	Roles	
- Elaboration of Regional Investment Prospectus.	ODS as coordinator. BFPME, APIA, API, SICAR/SODIS, BTS, Technopoles, IRAs, and commercial banks.	<ul style="list-style-type: none"> - ODS to coordinate technical roundtable gathering the financial actors to define the contents of the Prospectus. - ODS to collect and organize relevant data and elaborate the Prospectus considering the discussion at the roundtable, to manage dissemination of the Prospectus. 	
- Investment promotion.	ODS and FIPA	<ul style="list-style-type: none"> - ODS and FIPA to share information concerning planning and execution of promotional activities at home, and joint participation in investment forum abroad. - ODS and FIPA to discuss the needs and possibility to decentralize FIPA and have regional representatives. 	
- Definition and implementation of pilot “game changer” project (s), focusing on women, youth beneficiaries and start-up(s)	ODS BFPME, APIA, API, SICAR/SODIS, BTS, Technopoles, IRAs, and commercial banks.	<ul style="list-style-type: none"> - ODS as a coordinator - Other actors to provide technical and financial supports, both in the definition and implementation phases. 	
- Designing and Establishment of Special Regional Investment Funds	MDICI and ODS	<ul style="list-style-type: none"> - MDICI and ODS for resource mobilization and technical assistance, possibly in collaboration with international cooperation agencies 	
Indicators		Risks (external conditions)	
<ul style="list-style-type: none"> - Regional Investment Prospectus elaborated and periodically revised and updated as necessary. - Increase in private investment (FDI and national) value and effects in establishment of new enterprises and job creation - Concretization of pilot “game changer” project (launch at least two cases in three years) - Establishment and resource allocation in the Special Funds 		<ul style="list-style-type: none"> - Budget constraints - Regulatory constraints (land property, land usage, etc.) 	

Strategy	IME-2	Strengthening of marketing of regional specialty products (principally processed dates and olives) and services		
Plan	IME-2-1	Improvement of market intelligence (market trends, strategic partnerships, etc.)		
Intervention Area	Six governorates (especially in Médenine, Kébili, Gafsa, Tozeur)	Implementing agency	ODS with key sector actors	
Description				
The proposed plan aims to consolidate relevant market intelligence, a platform based on which up-dated marketing strategies of the selected specialty products to be elaborated. The market intelligence should include the analysis of market trends, and identification of key market players and their profile, at minimum.				
Action Plan				
Action		Relevant organizations		Roles
- Formation of Marketing Committee - Consolidation of market intelligence		Marketing Committee (described in the IME-2-2) ODS, GIF, private sector, UTICA, Chamber of Commerce		(Marketing Committee) To collect information and organize producers, processors, traders, and other key players, including UTICA and Chamber of Commerce to jointly analyse the data and understand the markets (with external technical assistance as necessary) (ODS) To channel supports in accordance with the needs of the Marketing Committee.
- Management of market intelligence, including systematic dissemination and sharing of information for key players		Marketing Committee (described in the IME-2-2)		Information management and dissemination.
Indicators				Risks (external conditions)
- Availability of update information and analysis of specialty products - Sound management of market intelligence				- Budget constraints - Lack of interests to take collective actions among relevant actors

Strategy	IME-2	Strengthening of marketing of regional specialty products (principally processed dates and olives) and services	
Plan	IME-2-2	Development of promotional tools and improvement of promotional activities	
Intervention Area	Six governorates (especially in Médenine, Kebîli, Gafsa, Tozeur)	Implementing agency	ODS with UTICA and Chamber of Commerce
Description			
The proposed plan aims to elaborate effective promotional tools based on market information and by visualizing identification of south brand. The plan also contemplates alignment of promotional efforts to make them more effectively and cost-efficiently.			
Action Plan			
Action	Relevant organizations		Roles
-Formation of Marketing Committee of major products	Chamber of commerce, UTICA, ODS, Regional Development Committee		Coordination of key stakeholders to form Marketing Committee(s)
- Development of regional/product brands and certification system	Marketing Committee, Regional Development Taskforce, ODS, Ministry of Industry, Ministry of Agriculture		Marketing Committee to plan and coordinate development process of branding and certification system, with participation of other key actors.
-Resource mobilization for marketing fund	Marketing Committee		Resource mobilization to secure appropriate budget for implementation of marketing strategies.
- Execution of collective promotional activities	Marketing Committee, relevant key players		(Marketing Committee) Coordination of planning and execution of joint activities. (relevant key players) Contribution to and participation in the promotional activities.
Indicators		Risks (external conditions)	
<ul style="list-style-type: none"> - Marketing Committee established and functioning to carry out its mandate - South of Tunisia product brand defined and adopted and recognized 		<ul style="list-style-type: none"> - Insufficient interests among relevant stakeholders to join forces. - Regulation constraints for certification registration. 	

Strategy	IME-2	Strengthening of marketing of regional specialty products (principally processed dates and olives) and services	
Plan	IME-2-3	Enhancement of market-driven research activities for product development and improvement for product/service differentiation	
Intervention Area	Six governorates (Particularly in Médenine, Gafsa, Kébili, Tozeur)	Implementing agency	ODS
Description			
The proposed plan aims to enhance the market-oriented focus of the research activities and effectively exploit useful results in development new products or up-grading the existing ones. The relevant research entities shall include technopoles/research centres, IRA, universities, technical school (design schools), Packtec, among others.			
Action Plan			
Action	Relevant organizations	Roles	
- Identification and organization of strategic partnership	ODS and Marketing Committee	Identification of relevant actors. Match-making of relevant actors.	
- Elaboration of R&D innovation plan with product development focus and the implementation of the plan	Marketing Committee, relevant R&D entities	(Marketing Committee) Dissemination of the market intelligence to the R&D actors and joint elaboration of innovation plan. Request specific research (concept), disseminate relevant research results to businesses and potential investors. (R&D) Carrying out relevant researches and being in charge of the technical aspects of the product development.	
Indicators		Risks (external conditions)	
<ul style="list-style-type: none"> - Number of newly registered patent - Number of successfully launched new or up-graded product 		<ul style="list-style-type: none"> - Resource constraints (financial and human) of research entities - Competition with similar/substitute products 	

Strategy	IME-3	To promote export growth and diversification	
Plan	IME-3-2	Export promotion of micro and small enterprises	
Intervention Area	Six governorates	Implementing agency	ODS in collaboration with Chamber of Commerce
Description			
The proposed plan aims to enhance the knowledge and skills of micro and small enterprises, and encourage them to export their goods and services by providing capacity building and other types of support, including promotion of their exportable goods/services. In order to establish foundation to enable continuous support to micro and small enterprises at local level, proper capacities will be institutionalized in the local Chambers of Commerce.			
Action Plan			
Action	Relevant organizations		Roles
-Capacity building of regional Chambers of Commerce	Chamber of Commerce		-Capacity building to be provided by external assistance.
-Capacity building of micro and small enterprises.	Chamber of Commerce, CEPEX, ODS		-Provision of capacity building -Canalization of assistance through existing support system as needed
-Promotion of exportable goods, including establishment of showroom space of exportable goods.	Chamber of Commerce, CEPEX		-Support export promotion activities -Securing space and management of showroom
Indicators		Risks (external conditions)	
<ul style="list-style-type: none"> - Number of micro and small enterprises benefited from capacity building and other types of supports - Increase in number and volume of exports by micro and small enterprises of the South Region - Capacity of regional Chambers of Commerce strengthened and its functions improved 		<ul style="list-style-type: none"> - Limited resources of support - Economic decline in the export destination countries 	

CHAPTER 4 Strategic Environmental Assessment (SEA)

4.1 Environmental management framework in Tunisia

4.1.1 Environmental policy

(1) Key environmental policies

(a) Agenda 21

A few years after the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Tunisia formulated in 1995 its own programme of sustainable development (national Agenda 21). The comprehensive approach of the programme aims to promote "a mode of integral development, based on social equity and the warranty of the well-being of all in a healthy, safe and protected environment." This policy is based on three priority intervention areas: (i) promotion of a competitive economy, based on an effective partnership between public administration and private sector; (ii) promotion of a model of equitable society, based on national solidarity and aimed at the eradication of poverty and social exclusion and (iii) rational and sustainable use of the country's potential (urban and rural), its natural resources and its environment. Tunisia has also decided to implement local versions of Agenda 21 in order to integrate environmental concerns into local plans and programmes of development, and, currently, more than 100 communities have their own local Agenda 21 plans. Agenda 21 serves as a conceptual guide for decision makers and is useful to position and adjust the various plans of economic and social development of the country.

(b) Eleventh five-year Development Plan

To date, the five-year development plan has served as the base document for the development policy. Since the eighth Development Plan (1992-1996), Tunisia has integrated the concept of environment in its development policy, and the concept of sustainable development since the 10th Development Plan (2002-2006). The priority courses of action in the environmental sector, as explained in the guidelines of the 11th plan (2007-11), are: generalization of the foundations for a better quality of life; generalization of environmental upgrading; rationalization of use of terrestrial and marine natural resources; energy management; improvement of health security in particular in connection with the issue of sanitation; development of waste recycling sector.

(2) International conventions

Since independence, and especially since the 1980s, Tunisia has signed and ratified more than 70 international and regional conventions, agreements and treaties relating to environment. These conventions have influenced the stance and content of domestic policy and programmes. The recognition of the conventions ratified by Tunisia has always been accompanied by a strengthening of the institutional and legislative framework of the country.

(3) Visibility and evolutions of Tunisia's environmental policy

Action plans and environmental activities have proliferated since the 1990s. They have essentially been targeting the urban environment: sanitation, waste management, pollution control, etc.; and substantial and significant achievements are to be highlighted. Several projects in the field of solar energy have been launched within the framework of a national solar plan. Transformation of biogas is also under review. A set of tools and resources have been put in place, including special funds (National Fund for Energy Conservation - Fonds National de Maîtrise de l'Énergie - FNME, Industrial Pollution Control Fund - Fonds de dépollution industrielle - FODEP, Fund for city enhancement), financial incentives,

policies and strategies in the different environmental fields and action plans relating to international environmental conventions.

Nevertheless, the impact of some programmes on the environment and the quality of life of the people do not correspond to the level of investments made and objectives expected¹. Institutional issues, problems in terms of governance and a sector-based approach, which does not take into account all the social and environmental implications, are often the root cause of such underachievement. The implementation and translation into concrete actions of different environmental strategies remain fragmented, particularly at the level of regional action Plans for environment conservation (Plans d'action régionaux pour l'environnement - PRE) and the local Agenda 21 Plans. The majority of strategic documents of environmental policies and the recommendations of numerous studies of good quality are greatly underutilized and undervalued, without any visible realization of coherent actions in the field.

In the context of democratic transition, Tunisia is bound to make serious reforms in order to promote genuine sustainable development. This sustainable development should generate jobs, be economically dynamic, fair, integral, sustainable and responsible. It is therefore necessary to reposition the environmental issues and sustainable development on the politico-administrative scene by placing it at higher levels of decision-making and as the essential framework for planning and programming. The transition to integrated and crosscutting approaches, making it possible to incorporate a territorial vision and a broader participation of different public and private actors, is to be encouraged. Current opportunities focus particularly on:

- Inclusion of environmental rights in the country's new constitution which was adopted in 2014
- Establishment of a true transversal vision of the environment and sustainable development, concerted and validated by all decision makers
- Finalization of the elaboration of the environmental Code as a basic law
- Transition to a green economy
- Regionalization or decentralisation

A provisional version of the National Strategy for Sustainable Development 2012-2016 (NSSD) has existed since November 2011, while the National Report of Tunisia for Rio+20 (October 2011) stresses the importance of the green economy and better environmental governance. These two documents may serve as a guide for a new environmental and sustainable development policy of the country, but they still need to be approved by the Government. It will then be necessary to ensure their consistency with existing development schemes / plans and, in particular, the implementation of concrete and coordinated actions in a framework of mechanisms involving territorial and sectoral planning, at both national and regional levels.

4.1.2 Institutional framework

Many qualified institutions deal with management and protection of the environment as well as production of environmental information at the national level.

(1) Ministry of Environment

Since its establishment in 1991, the ministry is responsible for proposing the States' general policy in relation to protection of the environment, conservation of nature, promotion of quality of life and establishment of the foundations for sustainable development in the country's general and sector-based

¹ *Profil Environnemental de la Tunisie* (Environmental profile of Tunisia), 2012, Euronet Consortium, EU, Ministry of Environment

policies, in cooperation with the concerned ministries, departments and structures; ensuring its implementation; and promoting the legislation relating to the protection of the environment.

(2) National Agency of Environment Protection (ANPE)

ANPE was created under Law no. 88-91 dated 2 August 1988 and amended by Law no. 92-115 of 30 November 1992, article 3 of which stipulates that ANPE has as a mission, among others, "to control and monitor polluting discharges and the treatment facilities for such discharges".

ANPE takes part in the development of the general Government policy on pollution control and environmental protection, and in its implementation by specific and sector-based actions as well as comprehensive actions under the national development plan. One of ANPE's missions is to control pollution sources, monitor the supervision network of air quality and raise public awareness.

(3) Tunisian Observatory for the Environment and the Sustainable Development (OTEDD)

OTEDD, placed under the authority of the Ministry of Environment, is considered as the dashboard for monitoring the activities relating to sustainable development in the country. Its aim is to put in place a permanent scheme enabling collection, production, analysis, management and dissemination of information on the status of the environment and sustainable development, in order to help planners make decisions taking into account environmental protection and development requirements.

(4) Coastal Protection and Planning Agency (APAL)

APAL is a public, non-administrative institution, created in July 1995, under the authority of the Ministry of Environment whose functions are mainly: management of the public maritime domain, management of coastal areas, evaluation studies and research relating to the protection of the coastline, and fragile natural areas, and rehabilitation of fragile natural coastal areas (wetlands, islands, etc.).

(5) National Sanitation Utility (*Office Nationale de l'Assainissement* - ONAS)

ONAS is a public, non-administrative corporation, under the authority of the Ministry of Environment. ONAS is governed by a board of directors made up of representatives of the ministerial departments concerned by its activities, and a representative of the large municipalities. It was created on 3 August 1974 following the urban development experienced in Tunisia in the 1970s.

The law on the creation of the national sanitation utility was amended by Law no. 93/41, dated 19 April 1993, under which ONAS moved from a managing role in the sewerage network to the role of main actor in the area of protection of the water environment and pollution control independently of the source.

ONAS's missions are to control any kind of water pollution, to plan and implement integrated sanitation projects, to ensure management, operation, maintenance and renewal of wastewater facilities, and promotion and re-use of by-products of the wastewater treatment process.

(6) The National Agency of Waste Management (*Agence Nationale de Gestion des Déchets* - ANGeD)

ANGeD, a public, non-administrative institution placed under supervision of the Ministry of Environment, takes part in the development of national waste management programmes, contributes to help and strengthens clusters or regional structures that local authorities create in the field of sustainable management of structures and controlled landfills, technically assists manufacturers in areas such as waste management, takes charge of public waste management systems (plastic packaging, lubricating oils and used oil filters, cells and batteries, etc.), and promotes systems and programmes for collecting, recycling and transforming wastes.

4.1.3 Legislative framework

The environmental legislation is based on the Polluter Pays and Polluter Recovers principles (applied especially in the area of solid waste management). It is either of a preventative nature (environmental impact study, quality of air, etc.) or of an incentive nature (FODEP, FOCRED, tax benefits, etc.) and it takes into account Tunisia's commitments on an international scale through agreements and conventions.

The legislation and laws for the protection of the environment are quite developed, but their implementation on the ground is still very limited. Indeed, although since 1988 public authorities have introduced mechanisms in support of environmental policy, and despite the highly developed institutional landscape in Tunisia, environmental policy faces several challenges: continued economic growth that generates increased production of waste and wastewater, and increased emissions that endanger water and soil resources. To rectify this situation, the development of an environmental code will be of great value.

The main regulatory texts are presented below.

(1) Environmental Impact Assessment

Article 5 of Law no. 88-91 of 2 August 1988, creating the ANPE, as amended and supplemented by Law no. 92-115 of 30 November and Law no. 2000-14 of 30 January 2000, that gives ANPE the responsibility to ensure the control and monitoring of polluting discharges and the treatment facilities for such discharges.

Decree no. 2005-1991 of 11 July 2005, relating to the environmental impact study and defining the categories of units subject to the environmental impact study and the categories of units subject to specifications.

(2) Incentive tools

FODEP, created by Law no. 92-122 of 29 December 1992, relating to finance law for management 1993. It is governed by Application Decree no. 2120 of 25 October 1993, amended and supplemented by Decree no. 2005-2636 of 24 September 2005

Tax benefits: Decree no. 94-1191 of 30 May 1994, laying down the conditions for tax benefits for equipment designed for energy saving, research, production and commercialisation of renewable energy, research for geothermal energy, equipment required for pollution control or collection, transformation and processing of waste, equipment required for professional training, and equipment needed for research and development, as amended by Decree no. 99-11 of 4 January 1999.

(3) Management of solid waste

Law no. 96-41 of 10 June 1996, on waste and the control of their management and disposal. This law aims to establish the appropriate framework in the field of waste and its management methods to achieve the following basic objectives: the prevention and reduction of waste production and its harmfulness particularly by acting at the level of the manufacture and distribution of products; re-use of waste through its reutilization, recycling and any other actions aimed at recovering reusable materials and their use as a source of energy; development of landfills for the final disposal of waste, after exhaustion of all possibilities of re-use.

Decree no. 97-1102 of 2 June 1997, laying down the conditions and procedures for recovery and management of packaging bags and used packaging amended by Decree no. 2001-843 of 10 April 2001. This decree aims at ensuring the necessary conditions to guarantee the sound recovery and management of packaging bags and used packaging and to avoid the negative impact of their disposal.

Decree no. 2000-2339 of 10 October 2000, establishing the list of hazardous waste.

Decree no. 2002-693 of 1 April 2002 on the conditions and procedures for the recovery of lubricating oils and used oil filters and their management.

Decree no. 1064-2009 of 13 April 2009 on the criteria for issuing permits for hazardous waste management and permits for disposal of waste at sea and others.

(4) Industrial emissions

Articles 107 to 139 of Law no. 75-16 of 31 March 1975, promulgating the water Code as amended by Law no. 87-35.

The provisions of this code are intended to control water pollution in order to meet or reconcile the requirements of the supply of drinking water, public health, agriculture, industry, and any other human activity of general interest, biological life of the receiving body of water, and especially fish and fauna, as well as recreational water sports and protection of sites, and the conservation and drainage of water.

It applies to direct or indirect spills, drainage, discharges, and deposits of material of any kind, and more generally to anything likely to cause or increase water degradation by modifying its physical, chemical, biological or bacteriological characteristics. It prohibits the spillage or disposal at sea of substances of all kinds, particularly household or industrial waste likely to adversely affect public health, marine fauna and flora, and jeopardise the economic and tourism development of coastal regions.

Decree no. 85-56 of 2 January 1985, relating to the regulation of discharges into the receiving body of water; this decree aims to set the conditions under which discharges into the receiving body of water are restricted or prohibited. Article 14 of this decree provides for periodic checks. This implies that any operation subject to authorisation must perform periodic checks on its emissions and maintain a register for this purpose showing the date and results of the analyses performed.

Decree no. 94-1885 of 12 September 1994, laying down the conditions for the release and discharge of wastewater other than household water in sewerage systems installed in ONAS intervention areas. This decree provides for authorisations of release or discharge of residual wastewater other than household water in sewerage systems within the aforementioned Law of 19 April 1993, and determines the maximum advisable flows and concentrations.

(5) Air Pollution

Law no. 2007-34 of 4 June on the quality of air. This law aims to prevent, limit and reduce air pollution and its negative impacts on human health and on the environment as well as to lay down the procedures for monitoring air quality, in order to make effective the right of citizens to have a healthy environment and ensure sustainable development. Art. 9. – Notwithstanding the legislation in force, facility operators are required, prior to the operational phase, to equip their facilities with equipment and clean technologies that are able to prevent and limit air pollutants at the source. In addition, operators of facilities operating in one of the sectors of activities causing air pollution, the list of which is laid down by order of the Minister of Environment, must control air pollutants at the source and connect their facilities to the national air quality monitoring network at their own expense.

Decree no. 2010-2519 of 28 September 2010, laying down the limit values at the source of air pollutants from stationary sources. Article 3 of this decree stipulates that “Facilities must be designed, installed and operated so as to avoid, limit and prevent air pollutants at the source, particularly through implementation of clean technologies, emission treatment according to their characteristics and

reduction of quantities released. The operator shall take all necessary precautionary measures in the design of its installation and its operation in order to limit the risks of accidental pollution of the air".

(6) Conservation of nature

Tunisia has a rich legal arsenal concerning the preservation of the components of nature (wild flora and fauna, national parks and nature reserves, wetlands, coast, forest, etc.).

Tunisia also has other legal texts relating to desertification control, energy management, etc.

(7) Expropriation for public utility

The expropriation for public utility is an administrative process by which the government requires an individual to cede ownership of a building for a public purpose and on payment of fair and prior compensation.

It is regulated by Law No. 76-85 of 11 August 1967 and amended by Law No. 2003-26 of 14 April 2003, which brought greater prominence to the interests of expropriated through better balance with the interests of the Nation under development. The basics of the operation of expropriation are fixed through a new organ, the Commission for recognition and reconciliation, which helps in securing the mutual agreement of the expropriated.

In the case that no amicable agreement is found, the expropriation moves in to a juridical phase in which the judge will determine the compensation and pronounce the possession of expropriating.

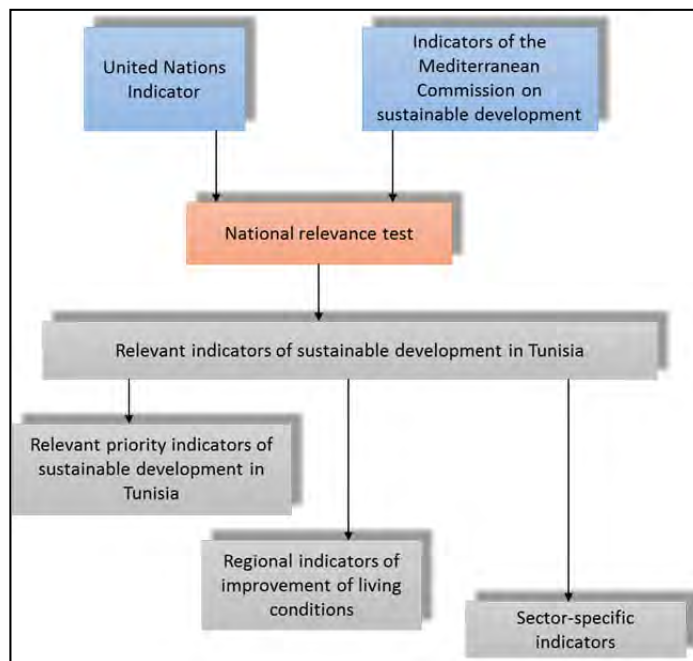
4.1.4 Environmental indicators²

Tunisia has carried out through OTEDD a testing of sustainable development indicators of the United Nations³ in 1998, and those of the Mediterranean Commission on Sustainable Development in 1999, in addition to several studies on sustainable development indicators. These tests and studies have focused mainly on two aspects, namely the relevance of indicators with respect to Tunisian specificities and issues and the technical aspects concerning the availability of information and calculability of these indicators.

All of these studies have made it possible to identify a list of indicators deemed to be relevant at national level. These indicators best reflect Tunisia's concerns by optimum adaptation to the socio-economic context of the country.

² *Vers un système de partage d'informations sur l'environnement* (Towards a shared environmental information system) « SEIS », *Rapport Pays Tunisie* (Country Report), EU, ANPE, INS, 2011

³ MDG7, the indicator for the sustainability of development used by the United Nations, focuses on approximately 15 indicators, including those relating to the ecological footprint of man, the depletion of natural resources, freshwater withdrawals, several forest indicators, per capita greenhouse gas emissions and the proportion of the threatened biological diversity.



Source: SEIS report, Tunisia

Figure 4.1-1 Evaluation process of international environmental indicators and national indicators by OTEDD

In addition, based on the list of relevant indicators, regional indicators of improvement of living conditions (IRACOV) have been developed.

At another level, and for better integration of the environmental dimension in the socio-economic sectors, OTEDD has initiated the development of a series of sector-specific reports and guides which covered the following sectors: fishery, industry, tourism, agriculture, forestry, oases, and water resources.

Each report and guide presents the situation of the sector in question, the challenges and the prospects for its sustainability, provides objectives and measures to ensure the sustainability of the sector and a set of indicators to ensure the monitoring of its sustainability.

These indicators have been covered in a series of publications in 2003, 2006, 2008 and 2010 for national indicators and in 2005, 2007 and 2010 for IRACOV. Regarding sectoral indicators of sustainable development, five sectors have been published namely: fishing, industry, tourism, forests and water resources.

4.2 Context and implementation methodology of the SEA

Tunisia's Southern region will undergo many transformations in the near future. These transformations, which will take place in the fields of industrial and agricultural production, tourism as well as infrastructure, will have very important consequences on the economy, the demography and the mobility of goods and people.

It is also advisable, through the prism of social and environmental protection, to take into account in the strategic environmental assessment (SEA) the major environmental and social challenges which this region currently faces and which will continue to be problematic for decades to come. SEA must assess how regional development, proposed in the long term, does not exacerbate existing environmental problems such as soil erosion, shoreline degradation, or underground water resources depletion.

4.2.1 Current situation of the SEA legislation in Tunisia

Tunisia's legislation in force to date does not stipulate the obligation of strategic impact assessment (SIA) or strategic environmental assessment (SEA) at the level of policies and programmes, although the concept is already known among professionals in the field and the process of institutionalization has been launched.

The first Tunisian SEA was conducted between 2008 and 2009 as part of the Project of development of the East Central region "Enfidha", and other studies are currently under consideration.

With a view to provide a framework and a direction to our SEA in the Tunisian context, first, it is important to understand the evolution of (4.2.1 (1)) on-going process of institutionalization of SEA system in Tunisia, but also to learn from the few (4.2.1 (2)) previous and programmed SEA experiences.

(1) Institutionalization process of SEA in Tunisia

The Ministry of Environment and Sustainable Development examined SEA institutionalization in Tunisia as part of a feasibility study carried out between 2008 and 2010 with funding and technical assistance from the German cooperation GIZ, under the German-Tunisian Environment Programme (EPP).

This study underlines, among other issues, that “the introduction of SEA in Tunisia is essentially designed as a technical-administrative initiative. It is not a political choice, but rather a logical consequence of integration of Tunisia in the international trend. As such, it must be done in the most harmonious possible way and, in particular, used for the modernization and upgrading of Tunisian administration, especially for a greater openness towards civil society”⁴.

Our interviews with ANPE allowed us to take into account the progress of the institutionalization of SEA in Tunisia since the end of the technical assistance described above. In the context of democratic transition, significant upgrading is needed across the country, with accompanying reforms, in order to promote genuine sustainable development, guaranteeing the integration of environmental issues at a high level of decision. In light of this context, and even if the SEA legislation has not yet been drafted and further feasibility studies have not even been scheduled, two major advances, that may indirectly support future institutionalization, must be noted.

It is on the one hand, the emphasis on environmental rights in the new Tunisian Constitution, promulgated on 10 February 2014, and on the other hand, the forthcoming completion of the elaboration of the new environmental Code. Adoption of the latter, which had been delayed because of the political instability in the country, could make mandatory the conduct of SEA.

(2) SEA experiences in Tunisia

Non-institutionalized to date, Tunisian SEA has so far only experienced a slow start, in particular with the strategic environmental assessment of development projects of the East central region “Enfidha”.

It is considered to be the first SEA conducted in Tunisia. It was initiated by the Ministry of Environment and Sustainable Development following the planning of a series of development projects in the East Central region in Tunisia, Enfidha, known for its sensitivity and natural vulnerability. This SEA mobilized many means, which is consistent with the fact that it was a pilot initiative, and had as its main objective to improve development planning in the area of Enfidha so as to strengthen the identification and choice of sustainable solutions relating to the economic, ecological and social dimensions. In the

⁴ *L'Évaluation Environnementale Stratégique, Faisabilité de son institutionnalisation en Tunisie* (Strategic Environmental Assessment (SEA), Feasibility of its institutionalization in Tunisia), Ministry of Equipment and Environment, GIZ, 2010

absence of national legislative frameworks, this study was greatly inspired by the principles of the OECD outlined in its guidelines.

Regarding the lessons learned and elements to be linked to our study, differences have been observed regarding the stage of project, but also for methodological reasons.

Indeed, this SEA analyses defined projects (airport etc.) and may therefore rather be considered as an early EIA because both reflection and technical research were so advanced. It required, to reach this goal, a full team of about 10 multidisciplinary experts for more than two years of work. For all these reasons, the methodology and the results expected by our SEA cannot and should not in any way be compared.

It is likely that other SEA experiments will be performed in Tunisia in the nearer or further future, relating to the evaluation of a threat hardly controllable in Tunisia, namely, the risk of industrial pollution. Large industrial projects such as development projects in the East Central region (Enfidha - Hergla), El Skhira and the Gulf of Gabès, as well as studies of diagnosis of the situation of the environment in some mining, extraction and processing zones of phosphate, esparto, pulp mill in Kasserine, South of Sfax, Oued Hamdoun in Sousse - Monastir, the Gulfs of Gabès and Tunis and Bizerte Lake can constitute new experiments of implementation of SEA.

4.2.2 SEA implementation

The strategic environmental assessment (SEA) of the project on regional development planning of the Southern Tunisia is being implemented in accordance with JICA guidelines for confirmation of environmental and social considerations (hereinafter referred to as "JICA guidelines") dated 2010.

Furthermore, without any Tunisian legislation on SEA, and in order to base our reflection on previously initiated evaluation studies, the basic principles outlined in the guidelines of the strategic environmental assessment of the OECD (hereinafter referred to as the "OECD guidelines") dated 2006 will be taken into account.

Thus, our study takes as a basis for its objectives and methodology some components prescribed by JICA guidelines on the one hand, and the principles outlined in the guidelines of the OECD, on the other hand.

(1) Objectives

JICA guidelines define SEA as the "evaluation implemented at the level of policies, plans and programmes, rather than an assessment of the impact at project level".

The three main objectives are as follows:

- 1) evaluation of significant impacts on the environment during the decision-making of policies, plans and programs;
- 2) comparison of impacts according to several alternative scenarios, and;
- 3) recognition, through public consultation, of the interests of the various stakeholders at an early stage in order to promote good governance.

More specifically, the ten components contained in the Terms of Reference of SEA from our study are as follows:

- 1) Review of alternatives to achieve the objectives of the project
- 2) Review of the content of policies and elaborated plans
- 3) Implementation of scoping
- 4) Confirmation of natural and social conditions as a reference line

- 5) Confirmation of environmental regulations and institutions
- 6) Prevision of environmental impacts
- 7) Assessment of the impact on the environment and review of the alternatives
- 8) Confirmation of mitigation measures
- 9) Confirmation of monitoring method
- 10) Attendance at meetings with stakeholders

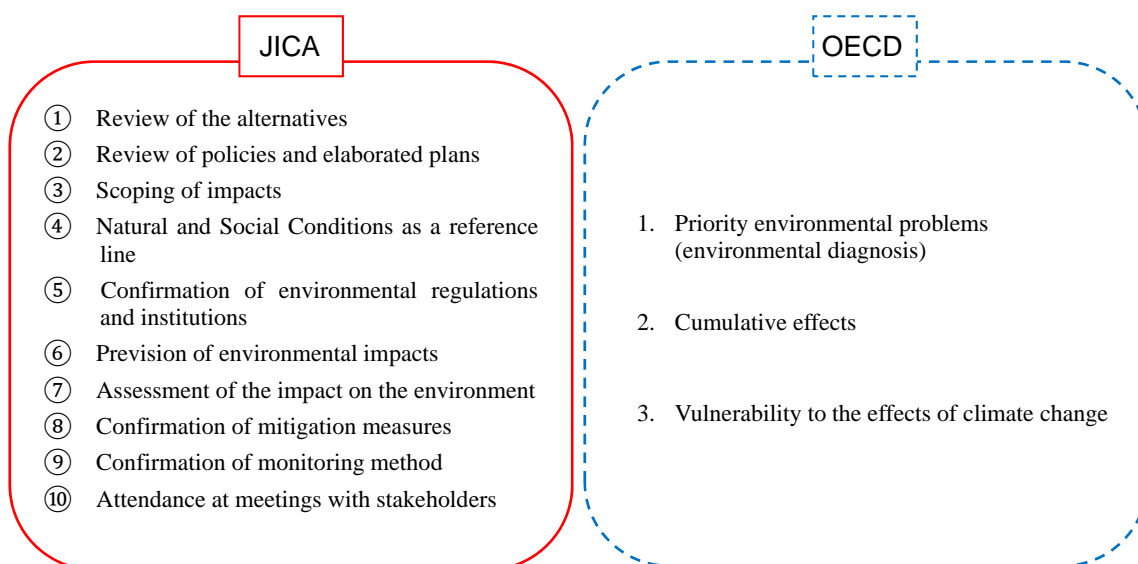
The OECD guidelines indicate that "the environmental assessment study should lead to the development of facilitative tools for the decision-making process, making it possible to measure the degree of coherence of the fixed development objectives for this region with the sensitivity of the natural and human environment".

More specifically, for projects of regional development such as ours, guidance note and checklist 5 "National and Sub-National Spatial Development Plans and Programmes" indicates that "SEA applied to spatial/regional plans or programmes provides an important opportunity to integrate sustainable development approaches within the decision-making process.", and advocates in this framework the recognition of the following fundamental questions:

- 1) What are the priority environmental problems in the area in question? Is there a danger that these problems could be exacerbated by the proposed programmes/plans?
- 2) Have any relevant cumulative issues been taken into account?
- 3) Are the proposed developments likely to be vulnerable to the impacts of climate change?

(2) Methodology

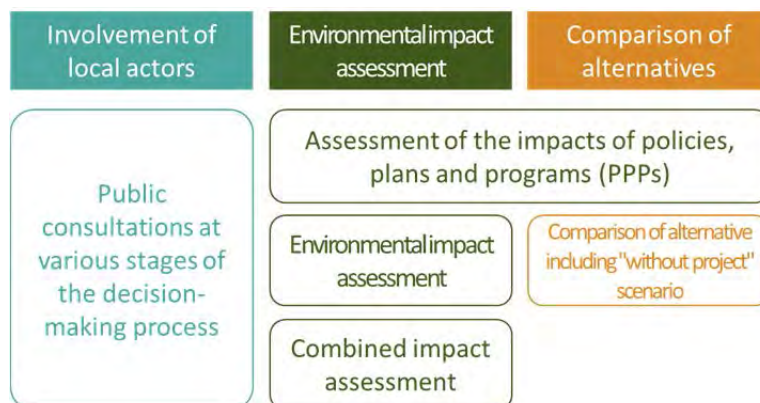
Taking into account the ten components prescribed by JICA guidelines, as well as the three principles outlined in the guidelines of OECD described above, the detailed methodological framework is as described in Figure 4.2-1 below.



Source: JICA Expert team (JET)

Figure 4.2-1 Detailed methodological framework for SEA implementation

By regrouping and reinterpreting these components into categories and eliminating the components of description of the existing situation, namely JICA components 4 and 5 OECD principle 1, the methodological framework is as described in Figure 4.2-2 below.



Source: JET

Figure 4.2-2 General methodological framework for SEA implementation

In terms of methodology, it is important to properly clarify the specificities of the project on regional development planning of the Southern Tunisia, which will have an impact on SEA implementation. These characteristics are the following.

- Complexity of the scope of study: taking in consideration virtually all the sectors of development, very large study area comprising of 6 governorates, South-East and South-West regions having different problems, multiple interactions among numerous institutions and donors, etc.
- Development prospects towards the project: recognition of the time factor of cumulative effects and in particular those caused by climate change must not infringe the identification of a clear vision of development towards the project. Recognition of forecast quantitative trends of climate change, such as described in chapter (3) 5.3.2. (Part I) in the calculations of development of the project, as well as the absence of such considerations, will be addressed during the discussions on the vision and the concept of development.
- Position and scale of SEA in the chronology of development: SEA does not set out to give answers to all questions, but only to the issues that are essential for adequate decision-making at every stage of development. Detail matters in terms of impact on the environment of the projects will be addresses in the EIA of the projects (After SEA).

(3) Implementation framework

The following issues are covered under SEA implementation framework.

(a) Advisory role of the agencies in SEA implementation

MDIC and ODS

As an integral part of a project which execution is taken care of by ODS, and one of its objectives being MDIC and ODS capacity development, SEA is being implemented in close cooperation with these two institutions.

On that subject, and in order to ensure the best possible connection between the consultants and ODS, a responsible from ODS Department of planning and statistics was appointed as the person responsible for SEA monitoring during the first mission in Tunisia in January and February 2014, which included discussions on SEA methodology, organization and schedule.

With the objective of strengthening the autonomy of ODS, the role of the person in charge of SEA monitoring includes, in a non-exhaustive manner, evaluation of the content of the study, monitoring of the process of implementation and internal coordination of ODS and concerned Tunisian services and agencies.

ANPE and the General Directorate of sustainable development of the Ministry of Environment

ANPE and the General Directorate of sustainable development of the Ministry of Equipment and Environment are the best contact points on matters of legislation of SEA and any other question concerning environmental issues.

During the first mission in Tunisia in January and February, 2014, these two institutions agreed to have a non-binding advisory role on qualitative content and methodology of the study. Consultants are responsible for submitting them the reports as well as any potential request for clarification when it is necessary.

(b) Underlying philosophy of sustainable development

The Southern Tunisia is plagued with many environmental problems that challenge greatly the possibilities of the future economic development of the region. This is particularly the case regarding the problem of depletion of underground water due to excessive use beyond the potential renewable volume. It is therefore crucial for the long-term development strategy to be formulated in accordance with a perspective of sustainable development.

(4) Schedule

SEA various components, in connection with the submission of reports and consultation of local actors, are implemented in accordance with the schedule presented in Figure 4.2-3.

Schedule	Contents of the study / Discussions	Methodology	Stakeholders
Inception	Discussions on the methodology of SEA implementation	Meeting to define the approach	JICA JET
	• Discussions on SEA implementation framework and policy • Nomination of the person in charge of SEA	Launch meeting, Steering Committee (S/C) meeting, Working Group (W/G) meeting	MDIC, ODS, Ministry of Equipment (MoE), National Agency of Environment Protection (ANPE), JET, etc
	Explanation of the project and SEA implementation strategy	First public consultation	Regional development committees of the six governorates
	Confirmation of political and institutional framework for the environmental and social considerations	Data collection / interviews	ODS / JET (Project Team) MoE, ANPE, etc
	• Confirmation of environmental and social conditions in the South JICA④ • Survey on natural/social conditions JICA⑤ • Identification of priority environmental problems (environmental diagnosis) OECD1	Site survey / data collection	ODS / JET (Project Team)
Progress report	Discussions on the vision / concept with the environmental and social considerations	W/G	ODS / JET (Project Team) MoE, ANPE, etc
	Implementation of scoping JICA③		
	Review of the content of policies, developed plans and integration of the environment JICA②	Data collection / interviews	ODS / JET (Project Team)
Interim report	Review of the vision / concept of development	S/C, W/G	MDIC, ODS, MoE, ANPE, etc
	Discussion on strategy / development plan	Second public consultation	Regional development committee of the six governorates, etc
	Discussion on strategy / development plan	W/G	ODS / JET (Project Team) MoE, ANPE, etc
	Discussions on impact predictions, alternatives, mitigation measures, methodology and monitoring system JICA⑥①⑧⑨		
Draft Final Report (DF/R)	* Review of the strategy / development plan • Evaluation of impacts, selection of alternative, mitigation measures, methodology and monitoring system JICA⑦①⑧⑨ * Evaluation of the cumulative effects OECD2 • Vulnerability to CC effects OECD3	S/C, W/G	MDIC, ODS, ANPE, etc
		Third public consultation	Regional development committee of the six governorates, etc
Final report	Confirmation of all SEA components		

Source: JET

Figure 4.2-3 schedule of SEA implementation

At the present stage of progress of the project, the results of the first mission carried out in January and February 2014 have been used for the development of the following components available in the present Progress Report.

- Confirmation of the natural and social conditions in the Southern Tunisia as a reference line (JICA component ④) in Chapters 4.2 and 4.3 (Part I)
- Confirmation of regulations and environmental institutions (JICA component ⑤) in Chapter 4.1
- Identification of priority environmental problems in the environmental diagnosis (OECD principle 1) in Chapter 4.3

(5) Participation of local stakeholders

As described above, one of SEA's main objectives is the involvement of local stakeholders in the decision-making process at an early stage of the project. For this purpose, public consultation meetings

represent an opportunity to discuss SEA main content and progress with various local actors, as shown in Table 4.2-1 below.

Table 4.2-1 Content of the discussions during the public consultation meetings

Public consultation meetings	Period	Content of the discussions
1 st	Feb. 2014	- Definition, methodological framework for the implementation of SEA - Scoping proposal of predictable impacts
2 nd	Sept. 2014	- Integration of environmental and social issues in the future long-term vision - Result of scoping
3 rd	Feb. 2015	- Prevision of environmental and social impacts - Survey and comparison of multiple scenarios (including alternative scenario “without project”)

Source: JET

4.3 First phase of SEA: Environmental diagnosis

After having briefly presented in Chapter 4 (Part I) the specific characteristics of the natural environment of Southern Tunisia, it is advisable to connect the latter, as part of the first phase of the SEA, to the pressure and degradation caused by human activities of the different development sectors present on the territory, and to diagnose the current and future status, especially in the context of climate change and desertification.

Thus, we will firstly concentrate on (4.3.1) evaluating assets and constraints of the natural environment from the perspective of regional development, then we will (4.3.2) assess major environmental problems, namely in observing the current status of the environment regarding degradation and pressures resulting from human practices, and finally we will consider (4.3.3) the recognition of aggravating factors of climate change and desertification. The findings of these three approaches of the natural environment will be represented in (4.3.4) a synthesis map of environmental diagnosis.

4.3.1 Evaluation of the assets and constraints of development of the natural environment

The natural environment in Southern Tunisia presents more constraints than assets from the perspective of future regional development, as summarized in Table 4.3-1.

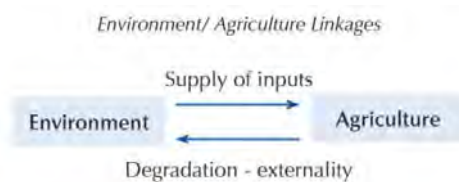
Table 4.3-1 Key assets and constraints in the management of the natural environment for the future development of the Southern Tunisia

Resources	Assets	Constraints
Geomorphology (4.3.1)	- The diversity of unique natural landscapes especially with the Sahara desert, Chott Jerid, as well as coastal, desert and mountainous oases	- Presence of a network of wind corridors - Vast regions of ergs and eroded sandy lands - Extensive regs - Fragmentation of impluvia, watersheds and importance of areas of runoff and gullies at the foothills of the Djebels - Extension of salty grounds, sebkhas and chotts
Water resources (4.3.2)	<i>Surface water</i>	
	- Potential of surface runoff isn't yet fully mobilized - Control and traditional know-how relating to water and soil conservation and presence of rain barrels	- Cost of mobilization development is high - Spatial and temporal variability of rainfalls makes designing structures for water and soil conservation a challenge
	<i>Groundwater</i>	
	- Important water resources in deep water tables in the Sahara desert - Average rate of deep water table development and exploitation is still low - Desalination and development of treated water (non-conventional water potential to be enhanced)	- Water tables are overexploited - High salinity of deep water tables - Cost of deep water wells is high - Cost of water desalination is high - Deep water resources are Non-renewable - Reuse of treated water is low
Climate (4.3.3)	- Sunlight potentially exploitable for solar energy - Winds potentially exploitable for wind energy	- Extremely arid climate - Very low, random and sporadic rains - Frequent potentially erosive winds, with desiccating capability conducive to silting - Frequent droughts
Soil and vegetation resources (4.3.4)	<i>Soil resources</i>	
	- Undeveloped mineral soil acting as shallow impluvia	- Shallow lithosol
	- Poorly developed soil with water intake suitable for forage crops, pastoral improvement, and oasis cultures	- Moderately deep, low organic matter soil with an average water storage capacity
	- Isohumic and calcimagnesian soil suitable for pastoral improvement	- Low organic matter soil
	- Halomorphic soil on a large exploitable area as a camel driver range	- Soil without any agronomic potential
	<i>Natural vegetation</i>	
	- El Ouara and Dahar ranges	- Very limited perennial pastoral potential
	- Rich grazing land with halophytes having potential for upgrade by camel drivers	- High risk of deterioration of resources and genetic erosion
- Desert vegetation having a strong potential for its aromatic and medicinal qualities	- Generalized overgrazing	

Source: JET

4.3.2 Assessment of major environmental problems

Despite the considerable efforts undertaken by the country to promote the protection of the environment, the negative ecological effects relating to natural resources usage intensification (water, soil, coast), which comes with economic development, remain the major environmental problem in Tunisia. The era characterized by the mobilization of "easy natural resources" is coming progressively to an end⁵. The management of these resources will certainly require more collective attention. This should be translated into practice by a radical change in current interactions⁶ between development sectors and the environment. These interactions are, as shown in Figure 4.3-1 below using the example of agriculture, based on the ordinary consumption of natural resources for the sheer benefit of the sector.



(Source: National report on the situation of the environment)

Figure 4.3-1 Example of unbalanced interaction between development sectors and the environment

In order to analyse the complexity of these interactions, and therefore of major environmental problems in our study area of the Southern Tunisia, we will opt for an approach based on (4.3.2 (1)) the existing situation of the different deteriorations of the natural environment, then consider (4.3.2 (2)) the responsibility of the development sectors in these damages. In order to improve readability and understanding of the logical link between the content of both sides, we will use a colour codified typography, namely **blue for deteriorations (d) observed on the environment**, **green for their aggravating natural phenomena**, **orange for pressures (p) that caused the damages in the first place**, and **red for the development sectors (s) that are responsible for these degradations**. Finally, a simplified diagram will be presented in Figure 4.3-6.

(1) Situation of the various deteriorations of the natural environment

Throughout history, human settlement was constantly related to the preservation of the environment in the Southern Tunisia, which could enable a sustainable ecological balance and a perfect adaptation to the climate. Low water consumption agricultural oasis systems in the South-East or land works for the mobilisation and preservation of rain water, such as jessours in the South-West, demonstrate this fact.

However, several recent practices go against this ancestral balance. This leads to all kinds of damages and more or less serious environmental degradation, which materialize in many ways and phenomena including in particular (d1) **water erosion**, (d2) **wind erosion**, and (d3) **soil salinization** which are the three main manifestations of desertification, (d4) **plant biodiversity loss**, (d5) **transformation of land use and natural ecosystems**, (d6) **ground water table salinization**, (d7) **coastal erosion**, (d8) **marine pollution** and (d9) **air pollution**.

(d1) Soil degradation by water erosion

Despite a high level of aridity in the Southern Tunisia, water erosion is the most prevalent aspect of erosion. It goes from rain wash and localised topsoil stripping to gullyng. The **thin mantle rock**, the

⁵ *Profil Environnemental de la Tunisie (Environmental profile of Tunisia)*, 2012, Euronet Consortium, EU, Ministry of Environment

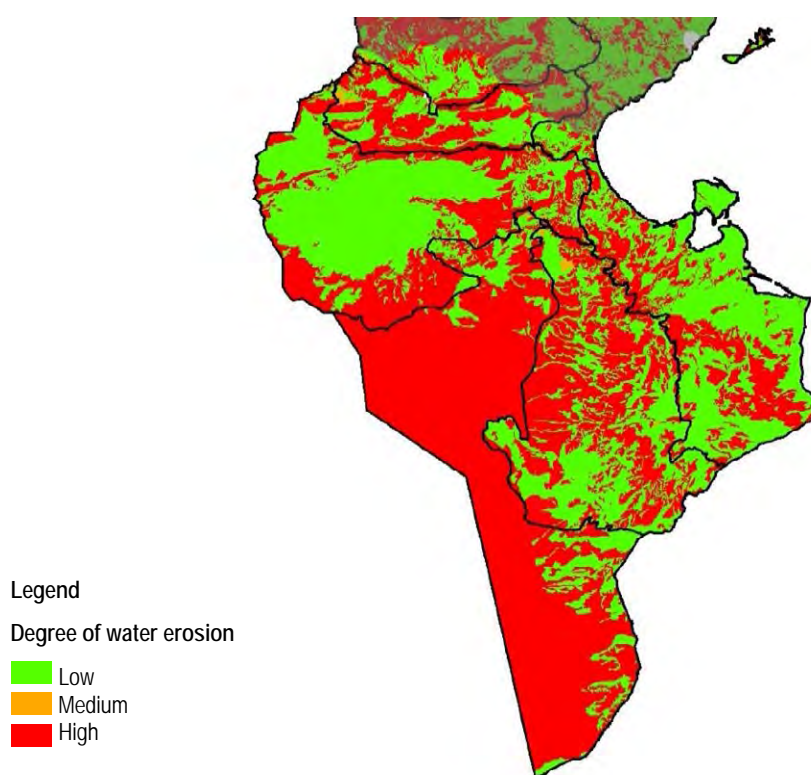
⁶ *Rapport National sur l'Etat de l'Environnement (National report on the situation of the environment), Special Edition 2010-2011*, 2013, OTEDD, ANPE

fragile topsoil, the heavy rainfall, that can cause occasional floods, are the root cause of this degradation. In the region of Jeffara and El Ouara, water erosion is due to occasional land cultivation by the agricultural sector (s1) in favourable years. Three areas where the intensity of soil degradation by water erosion is increasing can be observed, as shown in Figure 4.3-2.

Areas lowly affected by water erosion, namely rain wash areas without significant incision. Large areas in the region belong to this category. It is the case for glacis, structural patterns of the Jebels and their foothills, as well as large areas in Dhahar, Jeffara, or Chotts.

Moderately affected areas which are nearby areas of water concentration, in particular along the oueds (wadis), in contact with the Jebels.

Highly affected areas where ravines density is very high, particularly in the vicinity of Beni Khédache, Matmata, of the Grand Erg oriental.



Source: Desertification situation report, 2008

Figure 4.3-2 Spatial impact of water erosion in the Southern Tunisia

(d2) Soil degradation by wind erosion

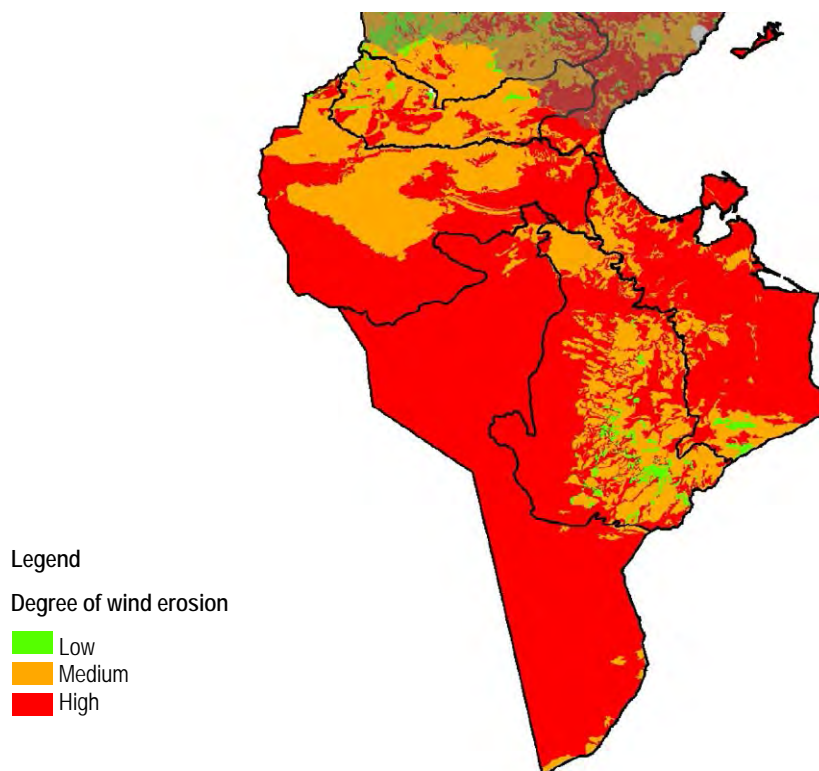
Wind erosion is the result of the **effect of the wind on sandy formations** after disturbance.

Wind erosion is mainly caused by very strong and frequent winds characterized by an important erosive potential. These winds, coming from the Grand Erg (sand sea), are channelled in a corridor before they reach the lower steppes. Wind dynamic continues beyond these corridors and converges towards zones of confluence (Menzel Habib and Grand Erg) with a more intense, erosive effect.

In addition, the **silting** and movement of sand dunes is a very important phenomenon in the Chotts region, especially in the Kébili governorate.

It is enhanced by the sandy soil texture. The most frequently encountered types of Aeolian accumulations in the Southern Tunisia are formed by sand veils, shrub-coppice dunes (nabkhas) or sand spit, and isolated or coalescent barchanes, the height of which only exceptionally exceeds 3m.

Also, the **agricultural sector (s1)**, with **ploughed soil spraying using polydisks and overgrazing**, largely contributed to the outbreak of these processes. Wind erosion affects a large part of the Southern Tunisia, as shown in Figure 4.3-3.



Source: Desertification situation report, 2008

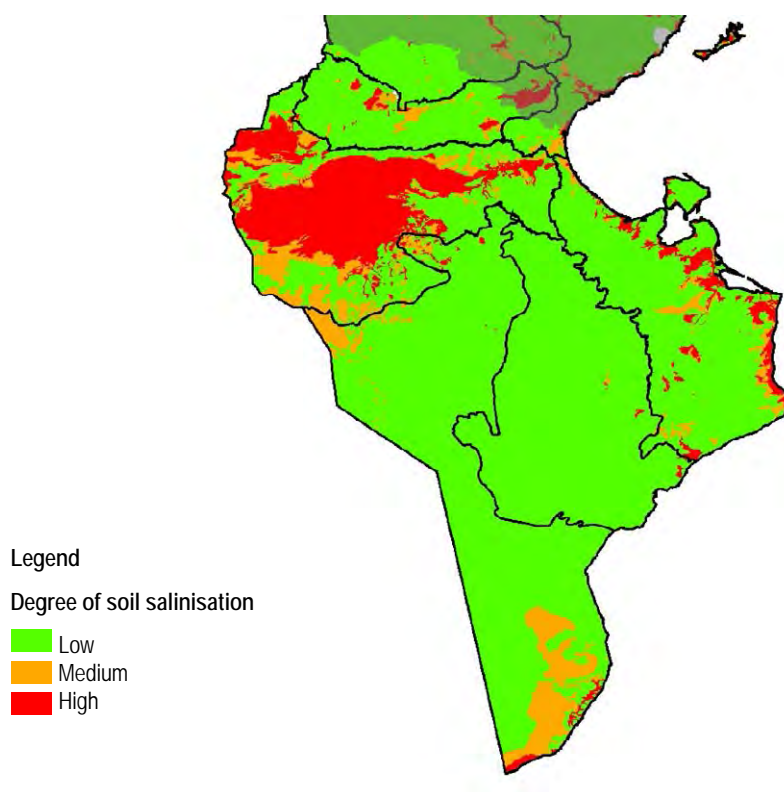
Figure 4.3-3 Spatial impact of wind erosion in the Southern Tunisia

(d3) Degradation by salinization of soils

The phenomenon of soil salinization is limited to the bordering areas of Sebkhass or Chotts in the South-West and irrigation districts using water charged with salinity greater than 5 g/l, or having a defective drainage network in the South-East.

In low-lying areas in an arid environment, salts accumulate by **evapo-concentration** in a natural way; this is the primary salinization. In areas of **irrigated agriculture (s1)**, it is the mishandling of **irrigation** and **drainage** that conditions very clearly the phenomena of salinization: this is the secondary salinization. Soil salinization is responsible for the decline in soil fertility and crop yield.

By estimating areas greatly affected by soil salinization in different regions, we evaluated these areas to about 500 ha in the oases of Gafsa, 2,500 ha in the oases of Tozeur, 5,000 ha in the oases of Kébili and about 2,000 ha in the oases of Gabès. Add to that 4,000 ha distributed in several other small areas, including those adjoining depressions in the Centre of the country and in Sahel. Numerous efforts are currently being undertaken (creation of new drainage systems, sanitation) to address this limitation.



Source: Desertification situation report, 2008

Figure 4.3-4 Spatial impact of soil salinization in the Southern Tunisia

(d4) Degradation through loss of plant diversity

A very important part of the soils of the region has been destroyed following a very long anthropogenic pressure on resources caused by urbanization (s4), agriculture (s1), industrial waste (s2) and more particularly by the disappearance of forest cover as well as the modification and degradation of vegetation after centuries of grazing of domestic animals and cultivation. The anthropozoic pressure has certainly increased over the past decades since the herd continues to increase. As for the composition of vegetation cover, the results of this increasing pressure are:

- decrease of the degree of perennial vegetation cover
- removal of shrubs and herbaceous plants to be used as fuel
- regression of flora, biological diversity and mainly of species of economic value

In intensive farming areas (s1), the use of commercial species (apple tree, peach tree, apricot tree, vine etc.) endangers local cultivars that are being forgotten. Similarly, the use of specific cultivars (Gabsi for pomegranate tree, Zidi, Saffouri for the fig tree etc.), brings along risks of rarefaction of other cultivars in the area.

(d5) Degradation by transformation of land use and natural ecosystems

The impact of lands acquired for agriculture (s1) on the natural environment is notable. Thus, there is a significant decrease of the size of sheer steppes in favour of crop lands, the acreage of which has increased by 200%.

In addition, a degradation of vegetation types is also observed. Developing on soils suitable for cultivation (ex: lowland steppes), they are often replaced by degradation stages dominated by species with low pastoral value.

The degradation resulting from a mismatch between agricultural activity and land potential shows the importance of the sprawl of crop production. About one-third of arboriculture is developed in marginal areas unsuitable for this enterprise, and 80% of grain farming conducted outside its cultivation area is out of control and harmful.

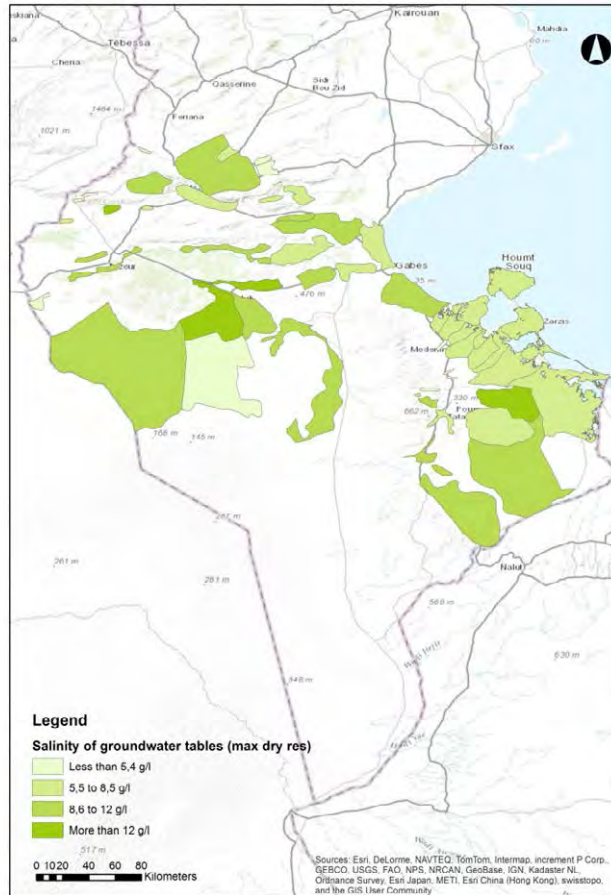
Also, animal husbandry (s1), formerly extensive, is concentrated in confined areas, causing increased pressure on natural resources, or is moving to types of husbandry which require considerable external forage crop.

(d6) Degradation by water table salinization

As described in section 4.3.2 (Part I) the development of ground water table exceeds by far the resources, in particular at Médenine, Gabès, Tozeur and Gafsa. This overexploitation by agricultural (s1) and industrial (s2) sectors resulted in the salinization of some water tables, in particular those shown in Figure 4.3-5.

- the area of ground water table of Jorf peninsula which has been classified as restricted area. Its overexploitation (147%) resulted in a gradual increase in salinity.
- the ground water table of Smar Médenine which renewable resources are estimated at 1.39 Mm³/year. Its overexploitation of 2.41 Mm³/year resulted in a decrease of the piezometric level and a gradual increase in salinity.

- the ground water table of Oum Tamar downstream (El Fej) which renewable resources are estimated at 0.47 Mm³/year. Its overexploitation (119%) is accompanied by a tendency to salinity.
- the water table of Djerid Oasis.
- the area of the water table of Gabès North which has been classified as restricted area.
- the area to the water table of Gabès South which has classified as restricted area.



Source: JET with data of DGRE

Figure 4.3-5 Salinity of ground water tables in the Southern Tunisia

(d7) Degradation by coastal erosion

Many areas of the coast of Djerba island are experiencing a regression of the shoreline more or less important. This regression is particularly prominent on the coasts exposed to the winds from the North, North-East to East and West, North-West to North, on both cliff coast and beach coast. The hotel infrastructure for **seaside tourism (s3)** of this region has strongly influenced the dynamic coastal erosion.

The Gulf of Gabès faces different anthropogenic pollutions and degradations, mainly relating to the development of urban, **industrial (s2)** activities, to **fishing (s1)** and to **tourism (s3)**. Pollution and degradation are mainly caused by discharges of the phosphate industry, devastating fish farming practices and over-exploitation of certain species, as well as various discharges (urban sewage, terrigenous sediments inputs by oueds, etc.).

(d8) Deterioration by marine pollution

The Gulf of Gabès is exposed to chemical pollution from the **industrial sector (s2)** particularly due to releases of phosphogypsum transported in considerable quantities, causing in the medium or long term serious problems within the marine ecosystem.

Marine pollution is also a factor in the **problematic proliferation of toxic species of phytoplankton**, which effects are sometimes detrimental to the quality of sea products, particularly that of bivalve molluscs whose exploitation became random in recent years.

Coupled with eutrophication, marine pollution has led to **marine biomass reduction, loss of bathing beaches**, and appearance of **diseases** in crustaceans bearing a risk to human health.

(d9) Degradation by air pollution

Pollutants dispersed or released into the air by the **chemical industries (s2)** such as Gabès Chemical Group are of various nature and alterations (gas, dust or particles) such as: ammonia (NH₃), sulfur dioxide (SO₂) fluorine compounds (hydrofluoric acid), sulphuric acid (H₂SO₄) and finally the dust of metal oxides, including carbon monoxide.

Because of the slower dispersion of the pollutant, air pollution is less dangerous and less important than marine pollution. The direction of the wind and the role of screen played by Gabès Oasis have helped protect this city from industrial chemical emissions. The wind directions seem to push this pollution and direct it either towards the sea, either inland.

(2) Description of the pressure generated by the development sectors

(s1) Pressure from the agricultural sector

Tunisian agriculture is affected by a wide range of environmental considerations, since, on the one hand, it faces tremendous pressure in terms of natural resource availability, and on the other hand, it affects the environment in a positive manner, but also too often in a negative one.

The area occupied by agricultural activities has always **expanded at the expense of natural ecosystems (d5)**. The clearing has been made on marginal lands prone to erosion and water stress. Indeed, the cultivation of the steppes with the development of olive culture and grain farming is the cause of **degradation of the vegetation cover (d4)** of grazing lands that turn into reg of stones (due to deflation), and into dunes of sand because of accumulations.

The development of **irrigated agriculture** is disproportionate, mobilizing more than 80% of the water resources. Unlike traditional techniques of water use, the **fairly irrational mobilization** of the latter as well as irrigation with degraded water from overexploited groundwater irrigation lead to **secondary soil salinization (d3)**, which has severe impact particularly on fragile oasis ecosystems.

Livestock, breeding and **pastoralism pressure** generates risks of **degradation of plant cover (d4)** and **soils (d2)**. The rate of **overgrazing** is close to 80% in the Southern Tunisia.

In the Gulf of Gabès, **fishing** activities threaten its own stocks and fisheries potential, already diminished by **marine pollution (d8)**, by **overexploitation** of certain species and the continuation of **unsustainable fishing practices**.

(s2) Pressure from the industrial sector

The industrial sector is probably the one that has the greatest environmental impact, by its liquid, gaseous and solid emissions and waste, its use of various resources such as water and raw materials (ores, quarry materials, agricultural products, etc.) and by its energy consumption from various sources, mainly fossil. Southern Tunisia is characterized by the presence of two of the six “most important pollution pockets in the country”⁷ of Gabès and Gafsa, caused in large extent by the industrial sector.

The chemical site in Gabès has been detrimental to the environment from the very early years following its start of production. Its substantial releases of phosphogypsum resulted in a degradation of the vegetation cover (d4), marine pollution (d8) with a daily release of tens of thousands of tonnes of phosphogypsum sludge and air pollution (d9) anticipated to be more serious with eutrophication.

In the Gafsa mining basin, mining activities of extraction and exploitation of phosphates are water consuming and generate significant air pollution (d9).

Furthermore, thermal power plants, cement plants, paper mills, petroleum refineries, chemical industries, food companies and steel producers are the main actors responsible for pollution (d9).

(s3) Pressure from the tourism sector

The tourism sector is both increasing the pressure on the natural resources and becoming a victim of the environmental degradation, in particular on the coastal area oasis environment.

The tourism sector has a very important environmental impact, both on the coastal area and in the oasis environment, through the mobilization of water resources, the discharge of sewage, and landscape standardization of the beaches and other natural areas.

In addition, seaside tourism, with the construction of hotels within the coastal region where building is prohibited, is the cause of the regression of the shoreline and has a part to play in the phenomenon of coastal erosion (d7).

As for oasis tourism, with the incidence of traffic and motor sports, it is responsible for the degradation of plant cover (d4).

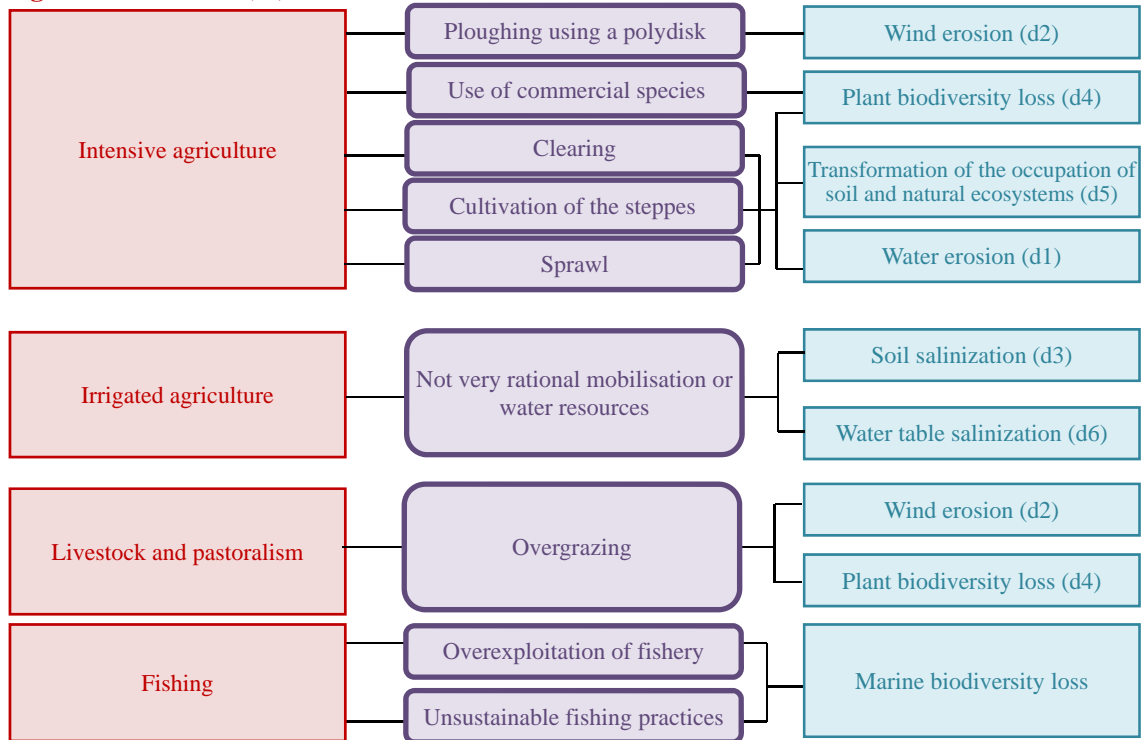
(s3) Pressure of urbanization

The development of spontaneous construction through the change of agricultural soils from their original use and occupation (d5) threatens the oasis systems, depriving them of one of their main support and threatening their sustainability⁸. This phenomenon has reached a disturbing level in the oasis of Gabès, El Hamma and Gafsa.

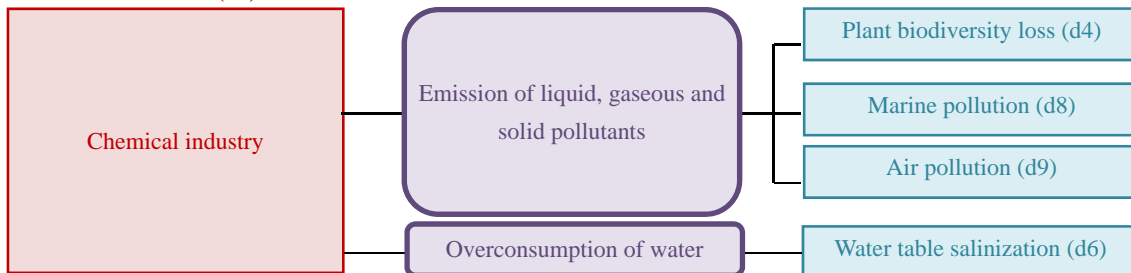
⁷ *Rapport National sur l'Etat de l'Environnement* (National report on the situation of the environment), Special Edition 2010-2011, 2013, OTEDD, ANPE

⁸ *Etude sur la gestion durable des systèmes oasiens* (Study on sustainable management of oasis systems), 2010, OTEDD, GTZ

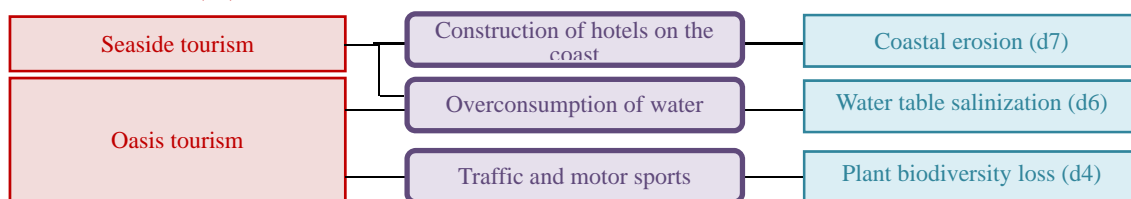
Agricultural sector (s1)



Industrial sector (s2)



Tourism sector (s3)



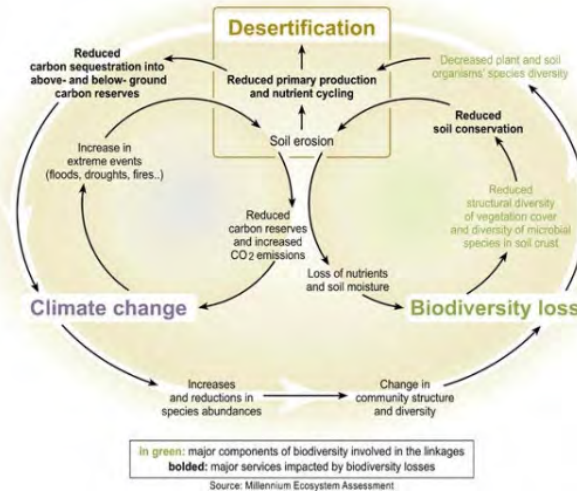
Source: JET

Figure 4.3-6 Schematic diagram of the pressure imposed by key sectors of development and degradation caused to natural environment in the Southern Tunisia

(3) Aggravating factors of climate change and desertification

The environment of the Southern Tunisia is characterized by its great fragility coming from the degradation and multiple threats described above.

As recently demonstrated by researchers specialised in the dry regions of Africa, the loss of biological diversity is directly influenced by the contexts of desertification and climate change. The problems are actually intertwined: "ecosystems have an influence on the climate, and vice-versa, climate change has considerable impacts on the local climate, increasing desertification, land degradation and loss of biological diversity"⁹.



Source: Millennium Ecosystem Assessment

Figure 4.3-7 Intertwined phenomena of climate change, desertification, and biodiversity loss.

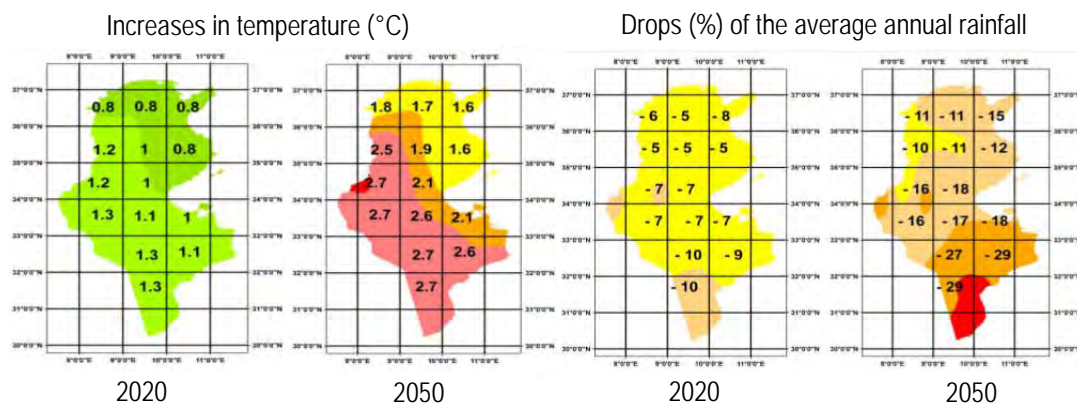
(a) Manifestations of climate change in the Southern Tunisia

The main manifestations of climate change in Tunisia, namely that the South of the country will be much more impacted than the North, such as anticipated by the national strategy on climate change of Tunisia¹⁰, are as follows:

- general increase in temperatures (up to + 1.3°C by 2020 and + 2.7°C by 2050)
- general decline in rainfall (up to -8% by 2020 and -30% by 2050)
- accelerated sea-level rise
- increase in the frequency of drought periods

⁹ **Dorsouma Al Hamdou and Mélanie** Requier-Desjardins, "climate variability, desertification and biodiversity in Africa: to adapt, an integrated approach», *Vertigo - la revue électronique en sciences de l'environnement*, Volume 8 number 1 | April 2008, URL: <http://vertigo.revues.org/5356>; DOI: 10.4000/vertigo.5356

¹⁰ *Stratégie Nationale sur le Changement Climatique de la Tunisie (National strategy on climate change of Tunisia)*, 2011, Ministry of Environment.



Source: National strategy on climate change of Tunisia, 2011

Figure 4.3-8 Manifestations of climate change in Tunisia

(b) Impacts of climate change on the development of the Southern Tunisia

The manifestations of climate change described above will induce an increase in the pressure on natural resources, as well as on the main socio-economic activities, and will accentuate the alarming trends presented in Chapter 4.3.2 (1).

Water resources of high salinity ground water table, non-renewable coastal groundwater and aquifers will decline by 28% nationwide in 2030. Water quality will be affected by the increase in salinity due to increased irrigation needs and the intrusion of the marine water. Non-renewable aquifers in the Southern Tunisia will be strongly affected because of the increased pressure caused by the decrease in rainfall.

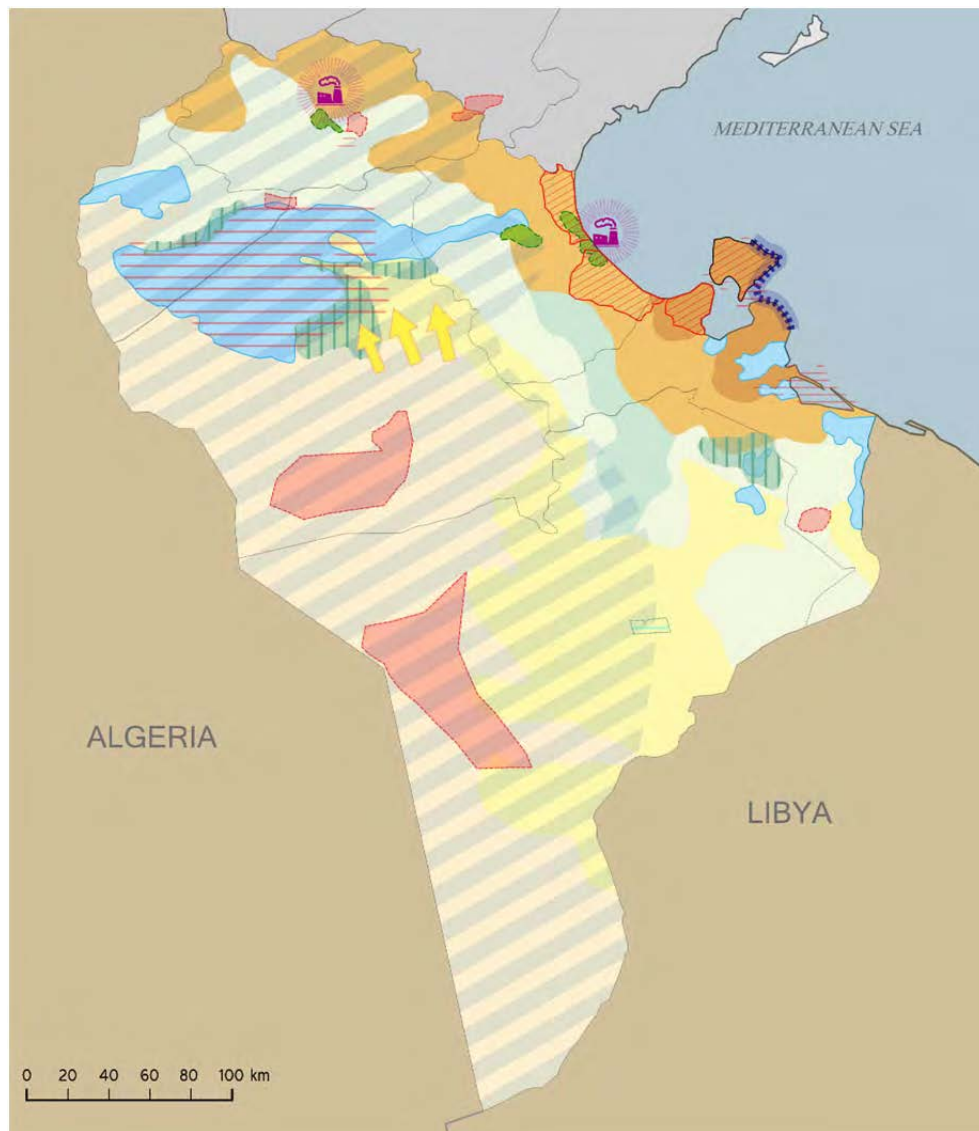
Projections for **agricultural sector**, taking into account the occurrence of extreme events (increase of the number of successive years of drought, floods) show a likely decrease of olive and tree production by 2030 and 2050. The land area of rainfed arboriculture will drop to the level of approximately 800,000 ha on a national scale, close to 50% in the Southern Tunisia.

The land area of grain crops in the South will experience an average drop of 20% in 2030 and 40% by 2050. Livestock (cattle, sheep and goats) will fall by up to 80% in the same region, because of the degradation of pastoral ecosystems; with a probable loss of 50% of the vegetation cover.

(4) Synthesis map of environmental diagnosis

As a summary of the assessment of major environmental issues in the Southern Tunisia, and in order to fulfil SEA potential to serve as a clear and legible support tool for decision making, it is proposed to elaborate a synthesis map of environmental diagnosis.

It summarizes (1) the current status of natural environment types in the context of desertification and climate change, (2) anthropogenic threats and major degradation that act as disincentive for future development, and (3) major areas of environmental protection.



Legend

1. STATE OF THE NATURAL ENVIRONMENT

- Oasis environment in an extremely precarious situation under the pressure of uncontrolled urbanization among other factors
- Arboriculture environment with saline underground resource, densely stocked and facing a very high risk of desertification
- Agro-pastoral environment with groundwater of variable level of quality and high risk of desertification
- Range environment with a medium risk of desertification
- Rainfed agricultural environment with a low risk of desertification through Soil and Water Conservation facilities
- Range environment with a low risk of desertification

2. MAJOR ENVIRONMENTAL THREATS

- Critical industrial pollution pockets
- Critical coastal erosion area
- Critical salinization area in ground water tables
- Area heavily dependent on non-renewable water in already overexploited deep aquifers
- Critical presence of silting phenomenon

3. PROTECTION OF NATURAL RESOURCES

- Banned ground water table, which acts as a disincentive for the future development
- National parks, biological diversity reserve
- RAMSAR Sites

Source: JET

Figure 4.3-9 Synthesis map of environmental diagnosis for the Southern Tunisia

The essential points are presented here below as a general conclusion of the environmental diagnosis and in order to better understand the synthesis map.

In Southern Tunisia, the mobilization of natural water and soil resources is almost complete. Furthermore, pollution reaches critical levels for human health in Gabès and Gafsa regions due to large and persistent mining and industrial pollution which severity was highlighted in the post-revolution phase.

It is therefore advisable, on the one hand, to change radically the paradigm of development in order to ensure the sustainability of natural resources and enable the continuation of economic and social progress, and, on the other hand, to accompany the pollution management of the affected areas to ensure a development as respectful of people as possible.

The specific conclusions of the diagnosis will be organized with a multi-sectorial approach for integration of environmental issues in the interim report.

Furthermore, it's advisable to not only consider the environment as an obstacle to development, but also to think about sectors of sustainable upgrade of natural resources (e.g. rational use and tourism development of protected areas, extension of sustainable arboriculture), and green economy (e.g. recycling, composting of household waste, reuse of waste water treated in accordance with the regulations). It is therefore urgent to move to a new operational phase of development which would effectively reconcile economic growth with sustainability of natural resources.

4.4 Second phase of SEA: Identification of potential impacts of the activities to be proposed by the Project

The purpose of the first phase of the Strategic Environmental Assessment (SEA) was to analyse pressures and degradations caused by human activities of the different sectors of development on the environment. From this diagnosis of the current situation of the Southern region in Tunisia, which painted a rather pessimistic picture of the local environment with the depletion of water and soil natural resources or industrial pollution, it is now advisable, in a second phase, to focus on the potential impacts that could occur with the implementation of our project, and that shall absolutely not worsen the existing local environmental threats.

Thus, it is appropriate to first (1) identify the potential impacts of the project through a scoping matrix; then (2) to justify the assessment of these impacts in detail for all the activities of the project; and finally, (3) to identify environmental and social strategic issues that might help to anticipate and to guide the direction of development.

4.4.1 Scoping matrix of the impacts

The Figure 4.4-1 below shows the matrix of identification of the potential impacts of the project, that is to say the activities that might eventually be implemented consequently to the development plan proposed within the project, as requested by JICA guidelines. This generic matrix arises from linking, on the one hand, the potential activities of productive sectors and infrastructure to be developed within the project, and on the other hand, the environmental components likely to be affected by these activities and infrastructure.

Furthermore, considering the great number of environmental issues to grasp, construction and operational phases will not be considered separately but together in the impact assessment.

For the time being, it should be noted that the potential impacts identified in the matrix will not appear in every natural environment (coastline, Sahara, oasis, plains, etc.) in the Southern region in Tunisia given the fact that the activities of the project differ depending on the environments. For example, date cultivation will be considered only in the oasis environment, and in the same way, olive cultivation will correspond exclusively to the plain environment.

On the basis of this scoping matrix, measures of mitigation and avoidance of impacts, alternatives and monitoring methods will be developed and presented in the provisional final report.

		Anti-pollution measures					Natural environment					Social environment														
		Air quality	Water quality	Soil pollution	Waste management	Noise and vibration	Offensive odors	Geology, topography, soil	F.auna, flora, ecosystem	Hydrology, hydric erosion	Protected area	Water resource use	Involuntary resettlement	Local employment	Local livelihood and res.	Social institutions	Poor	Indigenous or eth. min.	Misdistribution of benefits ar	Local conflicts of interest	Gender	Children's right	Cultural heritage	Infectious diseases, HIV	Landscape	Working conditions
Sectoral development	Agricultural development																									
	1. Dates	D	D	D	D	D	D	D	B-	A-	D	A-	D	C+	C+	D	C+	D	D	D	D	D	D	D	C+	D
	2. Olive and olive oil	D	C-	B-	B-	D	C-	C-	B-	D	D	C-	D	C+	C+	D	C+	D	D	D	D	D	D	D	C±	D
	3. Arboriculture & vegetables	D	D	C-	D	D	D	D	C-	D	D	C-	D	C+	C+	D	C+	D	D	D	D	D	D	D	D	D
	4. Livestock	C-	D	D	D	D	D	B-	B-	D	D	C-	D	C+	C+	D	C+	D	D	D	D	D	D	D	D	D
	5. Fishery, aquaculture, & fish processed product	D	D	D	B-	D	C-	C-	A	D	D	C-	C-	B+	B-	D	B+	D	D	D	D	D	D	D	D	D
	6. Food processing	B-	B-	D	B-	D	C-	D	D	D	D	C-	C-	B+	B-	D	B+	D	D	D	D	D	D	D	D	D
	Industrial development																									
	1. Mining sector and construction material industry	B-	B-	C-	C-	A-	D	A-	B-	D	C-	A-	B-	B+	B+	D	B+	B-	D	B-	D	D	D	D	A-	B-
	2. Textile industry	B-	B-	C-	C-	C-	D	D	C-	D	C-	A-	C-	B±	B+	D	B+	D	D	D	D	C-	D	D	D	B-
	3. Chemical industry	A-	A-	A-	C-	C-	A-	D	A	D	C-	B-	B-	B+	B+	D	B±	D	D	A	D	D	D	D	A-	B-
	Tourism development																									
	1. Beach mass tourism and mechanical tourism	D	C-	D	D	D	D	A-	C-	A-	B-	B-	C-	C±	D	D	C±	D	B-	B-	D	D	D	D	A-	D
2. Saharan tourism	D	D	D	D	D	D	D	C-	D	C-	C-	D	C+	C-	D	C+	C-	D	D	D	D	C-	D	B+	D	
3. Agro-tourism and culture tourism	D	D	D	D	D	D	D	D	D	D	D	D	B+	B+	D	B+	A+	D	D	B+	D	A+	D	A+	D	
4. MISE and medical tourism	D	D	D	D	D	D	D	D	D	D	D	D	B+	B+	B±	B+	D	D	D	D	D	D	D	D	D	
Infrastructure development	Transportation infrastructure																									
	1. Roads	B-	D	C-	D	B-	D	C-	B-	D	D	D	B-	B+	B+	B+	B+	D	D	D	D	D	D	C-	B+	
	2. Railroads	B-/D	D	D	D	B-	D	C-	B-	D	D	D	B-	B+	B+	B+	B+	D	D	D	D	D	D	D	B+	
	3. Ports	B-	B-	D	C±	B-	D	D	B-	B-	D	C-	B-	B+	D	D	B+	D	D	D	D	D	D	D	A-	D
	4. Airports	A-	C-	C-	C±	A-	D	D	A	D	D	C-	A-	A+	D	D	B+	D	D	D	D	D	D	D	A-	D
	Water supply infrastructure																									
1. Desalination plant	C-	C-	D	D	C-	D	D	B-	B-	C-	D	B-	B+	D	D	B+	D	D	D	D	D	D	D	A-	D	
Power generation																										
1. Solar power plant	D	D	D	D	D	D	C-	C-	D	D	D	B-	B+	A+	D	B+	D	D	D	D	D	D	D	A-	D	

Note: A+/-: Remarkable Positive/Serious Negative Impact is predicted.
 B+/-: Positive/Negative Impact is expected to some extent.
 C: Extent of Impact is unknown. (A further examination is needed and the impact could be defined as study progresses.)
 D: Impact is very small or nil and further survey is not required.

Figure 4.4-1 Matrix for identification of the potential impacts of the project

4.4.2 Justification for assessment of major potential impacts by activity

Impacts were evaluated on the basis of our discussions with local authorities and stakeholders we met during the first and second missions in Tunisia, but also on the basis of available environmental literature focusing as much as possible on the Tunisian experience or alternatively the Mediterranean experience.

Similar activities, the impacts of which are more or less comparable, will be covered in the table below only once in order to avoid repetition.

Agricultural development	
1. Dates	<p>Date production in so-called oasis ecosystems has severe impacts on water resources as well as on hydro morphological dynamics on lands covered with date palms.</p> <p>The surface of the Tunisian date groves, largely located in Kébili governorate, doubled between 1993 and 2009, resulting in a significant increase in the mobilization of water resources. These water resources, drawn from fossil groundwater systems containing little renewable water, are used in an irrational and unsustainable manner for flood irrigation of oases (A-).</p> <p>Moreover, since the oases of the South-West region in Tunisia are lacking an efficient drainage system (A-), irrigation water is not evacuated to the Chott, and stagnates, increasing the salinity of the soil, making it unsuitable for agriculture, which is a real threat to the sustainability of oases.</p> <p>Finally, the strong tendency to monoculture of Deglet Nour dates poses a threat to biodiversity (B-) with progressive loss of other varieties of dates, and constitute a risk for the sustainability of whole oases. Indeed, in the case of a possible attack by illness to which Deglet Nour is sensitive, the entire production would be damaged.¹¹</p>
2. Olives and olive oil	<p>Olive agriculture sector has an impact of variable severity with, on the one hand, the cultivation of olives and its different operating modes (traditional or modern intensive) and with, on the other hand, the manufacture of olive oil.</p> <p>If traditional operation has more positive effects than negative ones on the natural environment, intensive agriculture, which is the most common, bears many impacts such as soil organic matter depletion (B-), higher risks of soil erosion in hilly areas (C-), increase of withdrawal of water resources with limited capacity (C-), risk of pollution of surface and groundwater by chemical components from fertilizers, herbicides and phytosanitary products (B-), scarcity of flora and fauna, which diversity is reducing (B-), as well as the monotony of landscape resulting from the removal of trees of atypical form. Nevertheless, because of the cultivation of olive trees, the landscape gets a certain picturesque character (B±).</p> <p>Concerning production of olive oil, the major ecological problem is related to the black liquor (“margine”) produced while pressing the olives. It has a heavy load in organic and mineral matter. Its elimination is commonly achieved by scattering it in the fields, which is likely to affect the fertility of the fields due to the acidity of such wastewater and related content of mineral substances. The release and residue of black liquor in rivers is regulated in Tunisia, but illegal discharge can threaten aquatic plant and animal life (B-).¹²</p>
3. Arboriculture and vegetable cultivation	<p>Environmental impacts from arboriculture and vegetable cultivation generally correspond to the degradation of underground water quality (C-) because of excesses of agricultural inputs, but also to soil contamination (C-) occurring consequently to the spill of dangerous products and improper use of pesticides and fertilizers, as well as to important mobilization of water resources (C-).¹³</p>

¹¹ *Guide to sustainable management of oasis systems*, Ministry of Environment and Sustainable Development, Republic of Tunisia, 2010.

¹² *Assessment of impacts of the main WTO measures in the olive oil sector*, ADE/EU, 2002.

¹³ *Guidelines for the integrated assessment of environmental and social impacts*, African Development Bank (AfDB), 2003.

Agricultural development	
4. Animal husbandry	<p>Even if husbandry induces adverse effects of relatively mild intensity compared to other agriculture sub-sectors, these effects have a very large geographical range, due to the greater proportion of grazing lands compared with crop lands in the Southern region in Tunisia, as in any arid area. Pastoral activities bear impacts on soils, water resources, natural vegetation, biodiversity, and result in greenhouse gas emissions.</p> <p>Soil impacts translate into surface soil compaction as a result of cattle trampling, leading to the reduction of soil porosity and thus to the reduction of infiltration capacity. Moreover, pasture leads to vegetation recovery difficulties, and therefore accelerates phenomena of wind and water erosion of soils (B-).</p> <p>In addition, pasture seems to have an impact on plant biodiversity (C-). Indeed, not only a regression of perennial species and species with long cycles in favour of annual or short-cycle species has been observed, but also a regression of forage species in favour of less palatable plants.</p> <p>Husbandry activities produce greenhouse gas (C-) including methane emitted by ruminants (this gas would actually be responsible for 18% to 19% of the total greenhouse effect, ruminants producing 18% of the total emission of methane, with around 7.5% of global emissions at the African continent level), and carbon dioxide produced at the time of fires.¹⁴</p>
5. Fishing, aquaculture and processed fish products	<p>The fishing sector, together with the general growth of human activities around the Mediterranean Sea, is responsible for the decrease of exploited stocks (B-), the unreasonable production of waste (B-), the mortality of vulnerable species, and, generally, for significant upheavals of the concerned fragile ecosystems (A-).¹⁵</p> <p>Moreover, it is likely that the installations of fishery product processing facilities lead to a degradation of water quality, due to discharges of industrial wastewater (C-), as well as a proliferation of flies and odours in the vicinity (C-).¹⁶</p>
6. Food-processing industry	<p>The food-processing sector has a significant weight on the natural environment, with impacts in terms of energy consumption, CO₂ and air pollutant emission, water consumption and pollution, waste production, and diffusion of odour pollution.</p> <p>Indeed, food-processing industries contribute significantly to industrial pollution in Tunisia and, in particular in terms of air pollution (B-) and water pollution (B-). More specifically, these are the dairy industries that contribute most to air pollution, and edible oil or sugar manufacturing industries that contribute most to water pollution.¹⁷</p> <p>Wastes from food-processing industries are in vast majority organic wastes, but they may contain packaging waste and mineral waste such as ashes and other by-products of lime treatment, etc. (B-).</p>

¹⁴ *Animal husbandry and environment, looking for balance: Impact of pastoral systems on the environment in tropical and subtropical arid and sub-arid Africa and Asia*, Marc Carrière, FAO, 1996 (<ftp://ftp.fao.org/docrep/nonfao/LEAD/x6215f/x6215F00.pdf>).

¹⁵ *Impact of fishing techniques on the environment in the Mediterranean region*, Studies and journals GFCM 84, FAO, 2008.

¹⁶ *Environmental guide of various branches of industry*, Project for the upgrade of Tunisian private enterprises with environmental requirements (MNE), Republic of Tunisia, 2004.

¹⁷ *Free trade and environment in the Euro-Mediterranean context. Sector study Tunisia: textile and agri-food industries*, Hafehd Zaafrane, 2000.

Industrial development	
1. Mining sector and building material industry	<p>Whether in its extraction or processing phase, mining and building material industry bears relatively significant impacts on the environment in terms of dust, vibration, noise emissions, water pollution discharges, or modification of landscapes.</p> <p>Almost all of the mining operations, namely, blasting, grading, concentration and screening, are responsible for the emission of dust and particles, particularly persistent in an arid environment. In addition, with greenhouse gas emissions related to the operation as well as other gases, including sulphur dioxide in copper and aluminium foundries or perfluorinated carbon in oil and gas extraction sites, impacts on air quality are significant (A-).</p> <p>Pumping in order to drain water in mines can give rise to an acid mine drainage, which can eventually seep into surface and underground water systems. The migration of leachates from tailing sites may also seriously contaminate surface and underground water (B-).</p> <p>The noise caused by the blasting as well as other activities in the mining sector may scare away the local fauna (B-).</p> <p>Mining operations often require large quantities of water that is used to remove dust, separate the ore, and to treat it. As a result, in a region where water resources are extremely limited, the demand for water can greatly increase. Furthermore, installation of new enterprises and service industries, attracted in the region by the mining activity, would also contribute to an increase in the demand for water (A-).</p> <p>The mining industry has a major impact on the landscape, especially with changes in landforms, excavations, dumps, and heaps of waste, which, given the absence of dense vegetation, tend to be spotted more clearly in flat arid regions (A-).</p> <p>Finally, from the social point of view, the development of a mine can be a breeding ground of conflicts of interest between investors and local communities (B-). In some cases, local concerns are ignored and the rights of indigenous minorities neglected (B-). For example, the nomadic populations, which may be temporarily away from the area at the time where the decisions are taken, can be forgotten in the consultation process.¹⁸</p>
2. Textile industry	<p>The textile industry, characterized by its diversity in terms of used raw materials, whether natural (wool, silk, linen, cotton or hemp) or synthetic (polyamide, acrylic), but also in terms of process used to produce a garment, bears many environmental damages.</p> <p>It is especially during spinning, processing, dyeing and printing stages, that the textile industry uses large quantities of water resources (B-) as well as many chemicals such as chlorine, ammonia, sodium hydroxide, sulphuric acid, some heavy metals or formaldehyde, which can be found in discharges of toxic organic materials, in air or water pollution (B-).</p> <p>Furthermore, even if the situation in Tunisia is difficult to assess, the textile industry is a sector that is known for its harsh working conditions (C-) and employs many children illegally around the world (C-).</p> <p>Finally, in economic terms, it is worth noting that, even though the sector has a positive role on local employment, it faces a very harsh competition especially from Asian markets, and, therefore, does not really provide a sustainable channel able to guarantee jobs (B±).¹⁹</p>
3. Chemical industry	<p>The chemical industry is well known for its serious negative impacts on the environment, including vegetation cover degradation, but especially air, marine, water and soil pollution, which has significant effects on ecosystems and on human health.</p> <p>Air emissions are substantial and varied, with, as in the case of the industries in the Gulf of Gabès, foul smelling gases (A-) and gaseous pollutants (A-) having both immediate and long-term harmful impacts.</p> <p>Furthermore, industrial discharges being usually dumped in receiving water bodies such as oueds (wadis), lakes or seas, they are responsible for water pollution (A-).</p> <p>As the major environmental impacts of the chemical industry are known to all citizens, there is a strong social refusal from the local communities regarding those installations that create serious and perennial conflicts of interest (A-).</p> <p>Lastly, even if its positive economic role in the employment pool where it operates must be recognized, it is advisable to distinguish its economic contributions from the weight of the negative impacts in terms of cost of health (B±). The most socially vulnerable populations such as children, the elderly and the low-income households with limited access to health care are also more prone to the adverse effects of exposure to air pollution.^{20, 21}</p>

¹⁸ *Extractive industries in arid and semi-arid zones: Environmental planning and management*, Joachim Gratzfeld, IUCN, 2004.

¹⁹ *Textile: be to in touch with current taste and fashion trends, and in line with the Earth*, UNEP, 2003 (http://www.unep.fr/shared/publications/other/DTIx_0531xPA/textile.pdf).

²⁰ *Country Report Tunisia, project EPI-SEIS*, European Agency for the Environment, 2010.

Tourism development	
1. Mass beach tourism and motor sports tourism	<p>Mass beach tourism has a relatively important negative impact on the environment, especially in terms of excessive consumption of coastal areas and natural resources.</p> <p>As it is the case on the island of Djerba, it is especially the increasing number and the density of hotel units in the immediate vicinity of the coastal area that deteriorate natural landscapes (A-) durably and standardize the shore with artificial beaches. Constructions also accelerate the erosion of beaches (A-) and the disappearance of coastal dunes, which play a very important role in the natural balance of coastal and water environments (A-). The impacts are felt on marine alluvial dynamics, which can in turn affect the natural balance of surrounding protected areas (B-).</p> <p>Moreover, mass beach hotel industry is an energy-intensive sector in terms of power and water resources consumption (B-) in arid regions already facing difficulties.</p> <p>Regarding economic benefits of mass tourism, they exist, but are very limited (C±). Indeed, as in most cases stays in hotels include full board, tourists do not spend much money in the country.</p> <p>To conclude, it should be noted that international mass tourism, like any external activity implanted on a territory, causes important conflict of interest (B-) particularly in terms of urbanisation modes, property pressure, positioning of agriculture, etc.²²</p>
2. Saharan tourism	<p>The impacts of Saharan tourism are relatively unimportant²³ and are mainly due to the responsibility of the tourists themselves and professional supervisors rather than to infrastructure, which are virtually non-existent.</p> <p>Indeed, simply from ignorance or lack of supervision, tourists can unknowingly cause damage by failing to respect local communities, using excessively very rare water resources (C-), collecting rare plant or animal species (C-), damaging archaeological or heritage sites (C-), disposing of oil from vehicle and other wastes in natural environments, or ignoring the regulations of the national parks or other protected areas (C-).</p> <p>If relatively positive economic benefits are predictable in terms of local employment (C +) even in the poorest categories (C +), the Saharan tourism activities may disrupt the balance of indigenous communities including Berber and Bedouin (C-).</p> <p>With regard to the general trend of this sub-sector, although the demand for Saharan tourism is growing and is made possible by increasingly efficient access to remote areas, it is noted, nevertheless, that the tolerance threshold in number of visitors of sensitive desert ecosystems is relatively low, and that, consequently, this activity may not necessarily be a very promising sector for the future.</p>
3. Agro-tourism and cultural tourism	<p>By definition, agro-tourism and cultural tourism, as part of the new forms of alternative tourism, do not seem to have negative impacts on the natural environment.</p> <p>These new forms of tourism even foster the reinforcement of the symbolic value of cultural heritage sites (A +) as well as traditional landscapes, including rural countryside (A +) by giving them an economic value.</p> <p>Moreover, the originality and the cultural exception being sought after by cultural tourists, ethnic minorities (A +) are able to take advantage of this form of tourism.</p>
4. Medical tourism and corporate tourism	<p>Finally, given that alternative tourism creates employment opportunities for local population (B+), the community can see the merit of transmitting most aspects of its culture (history, lifestyle, cuisine, hospitality etc.) to future generations.²⁴</p> <p>Corporate tourism and medical tourism have virtually no impact on the natural environment.</p> <p>Bringing in foreign visitors, they both have positive effects on the local economy (B+).</p> <p>As for medical tourism, even though the inflow of foreign patients undeniably promotes the improvement of the quality of the sector, the risk that it leads to an increase in care prices and to a shortage of hospital staff, two phenomena having negative impacts on local residents (B±), must nevertheless be recognized.²⁵</p>

¹¹ Effects of the air pollution in urban areas on Health, WHO, 2014 (http://www.who.int/phe/health_topics/outdoorair/databases/health_impacts/en/).

²² *A pathway towards sustainable tourism in Tunisia: the case of the island of Djerba* Abderraouf Dribek, 2012.

²³ *Tourism and deserts: A practical guide to Managing the Social and the Environmental Impacts in the Desert Recreation Sector*, UNEP, 2006.

¹⁴ What is Cultural Tourism? in National Contact monumenten, Greg Richards, 2003.

²⁵ *The effects of medical tourism: Thailand's experience*, Anchana NaRanong & Viroj NaRanong, Bulletin of the World Health Organization, WHO, 2011 (<http://www.who.int/bulletin/volumes/89/5/09-072249/en/>).

Transport infrastructure	
1. Roads	<p>Road construction bears negative impacts on the environment both during the construction phase itself and during the operation phase, from the future vehicle users, once the infrastructure is completed.</p> <p>Air pollution is one of the most important impacts (B-) with the emission of dust and fumes (CO_x, NO_x, SO_x and PAH) during the construction work and on asphalt preparation sites. During the operation phase, road traffic is the main source of pollution.</p> <p>The vibrations of earth-moving machinery (B-) during construction could threaten the stability of built heritage in urban and village areas, and represent a nuisance for the local wildlife.</p> <p>Furthermore, in a given territory, the construction of a road always creates new fragmentations, barriers within the natural wild plant and animal habitats, which balance gets destabilized (B-).²⁶</p> <p>Examples of beneficial impacts following road construction include the improvement of accessibility to employment, to education and healthcare, trade promotion and trade development, as well as social cohesion (B+).²⁷</p>
2. Railways	<p>The railways have more or less similar impacts to those of roads, with the exception of air pollution that changes depending on the mode of traction of trains: relatively strong pollution in the case of a diesel locomotive (B-) and non-existent in the case of an electrified line (D).²⁸</p>
3. Ports	<p>Ports have direct environmental effects, apparent in the port area with, for instance, the handling of goods, and indirect effects, resulting from the movements of vessels calling at the port and other vehicles belonging to the intermodal transport chains serving the hinterland.</p> <p>All these port-related activities cause substantial atmospheric pollution (B-) with emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x), atmospheric particles and volatile organic compounds (VOCs).</p> <p>Noise pollution is relatively important (B-) and comes from different sources: ship engines, fans, cranes, tractors, trucks, etc.</p> <p>Port activity causes significant water pollution (B-) both around the site and in open sea where vessels operate, due in particular to ballast water treatment, oil spill and anti-fouling treatment of ships.</p> <p>Although the port site is likely to become a place generating many types of waste, it is also the place where the waste can be disposed, recycled or destroyed in good safety conditions (C±).²⁹</p>
4. Airports	<p>Because of a wide right-of-way of airports, important impacts can be expected both because of the destruction of natural ecosystems (A-) and of the potential expropriation of many neighbouring residents (A-).</p> <p>Moreover, permanent significant noise pollution (A-) is foreseeable, due to regular air traffic. Noise pollution will certainly cause some species to flee the area, in particular wild birds, leading to a disruption of the food chain in local ecosystems.</p> <p>Concerning the waste generation (C±), relatively large quantities of waste are foreseeable from the airport site. However, a smart management of waste, with a system of selective sorting, can easily be considered within the structure. Nevertheless, indirectly, a significant production of waste can be predicted from additional settlements due to the power of attraction of the airport.</p> <p>Airport activity is a remarkable economic booster (A+) because of the significant creation of jobs and businesses in the surrounding area, which represents a great opportunity for local authorities, as development will generate new resources in terms of professional and property tax. An airport can also bring jobs to less qualified, poor populations (B+).</p>

Drinking water supply infrastructure	
1. Desalination plants	<p>Desalination plants bear environmental impacts both during construction and operation, with problematic discharges into the natural environment.</p> <p>During the construction, usual impacts of any infrastructure on the coastal area, such as land-use change on a wide right-of-way, and the risk of expropriation (B-) are possible. The vulnerability of such infrastructure to climate change, with the foreseeable rise of sea level, must also be taken into account.</p>

²⁶ *Study on environmental impacts of the construction of the Gao Ansongo Labezanga road in Mali*, IEPF, 2007 (http://www.polymtl.ca/pub/sites/eie/docs/documents/303_Fi_rte_Gao_Mali.pdf).

²⁷ *It all starts with a road* Inger Andersen, World Bank, 2013 (<http://www.banquemonde.org/fr/news/opinion/2013/11/12/It-all-starts-with-a-road>).

²⁸ *Railway and the Environment, Building on the railways' environmental strengths* Community of European Railway and Infrastructure Companies (CER), 2009 (http://www.uic.org/homepage/railways_and_the_environment09.pdf).

²⁹ *Environmental impacts of navigation: The role of ports*, OECD publishing, OECD, 2011.

	<p>Environmental impacts due to the operation of the desalination units include related discharges of brine waste in the natural environment, which destabilize the ecological balance (B-). In particular, discharges of highly concentrated brine and insufficient dilution may impoverish or destroy water ecosystems and cause a deterioration of water quality.</p> <p>Finally, greenhouse gas emissions are stronger if desalination electric power is generated by fossil fuels. Although reverse osmosis consumes less electric power, it discharges more chemicals into the water (descaling, pre-treatments) (C-).³⁰</p>
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Electricity production	
1. Solar power plant	Solar power plants, regardless of their type, PV or CSP, have almost no impact on the natural environment, apart from some excavation work which may disturb local fauna during construction work (C-) and impact slightly the geology of the site (C-). ³¹

4.4.3 Strategic environmental and social issues

The identification of the potential impacts of the project, based on previous experience, makes it possible to anticipate risks and to imagine mitigation or alternative means to achieve the same objectives of development.

The strategic nature of SEA, defined as a clear and readable decision support tool, should be used to put environmental and social issues at the heart of development. This is why it seems legitimate to put forward some environmental and social thoughts before the reflection on sector or infrastructure development. It is clear, especially in fragile environments such as the one in the Southern region in Tunisia, that social and environmental factors are decisive in the choice of the strategic direction to give to the development.

Strategic environmental and social issues specific to the Southern region in Tunisia, which are considered as a prerequisite to the development, are 4.4.3 (1) Sustainable management of groundwater resource, 4.4.3 (2) Depollution of industrial centres and 4.4.3 (3) Better distribution of the economic benefits to local populations.

(1) Sustainable management of groundwater resources

Taking into consideration, on the one hand, the exploitation rate of renewable water tables and the critical situation of non-renewable fossil groundwater systems in the Southern region in Tunisia, and on the other hand, the necessity for all sectors of development to acquire water in order to meet their needs of growth, it is clear that the management of groundwater resources is an inevitable strategic issue for the future development of the region.



The situation of the sustainability of the resources is significantly different between a South-East region irrigated by many renewable groundwater tables and the Djefara aquifer system, and a South-West region highly dependent on non-renewable fossil water from deep aquifers of the Complex Terminal (CT) and the Continental Intercalary (CI). One of the primary objectives of the future management of the resources, confirmed by all related agencies encountered, namely SONEDE, CRDA, and OSS, is to

³⁰ Water, energy, desalination, and climate change in the Mediterranean region, Henri Boyé, Blue Plan, UNEP, 2008

³¹ Summary of the Study on environmental and social impact of Ouarzazate solar power project in Marrocco, AfDB, 2011.

reduce the operation of the sectors on non-renewable water tables to lower their load to preserve the resources.

After briefly reviewing the initial state of the exploitation, the following strategic solutions are conceivable to guide the sectors of development in the South-West and South-East, and in the region in general, towards a more sustainable development of groundwater resources.

In the South-West, as shown in Figure 4.4-2 below, all sectors currently draw on the non-renewable groundwater systems of CT and CI. Farmers refuse in particular to use shallow water tables because of their high salinity. A proposal could be the reduction of the load on deep groundwater tables by switching all industrial, tourist and domestic water³² exploitation on shallow groundwater tables by desalinating the water they hold using middle-sized demineralization stations. Regarding the exhaustion of irrigation water, small desalination units could be proposed to farmers.

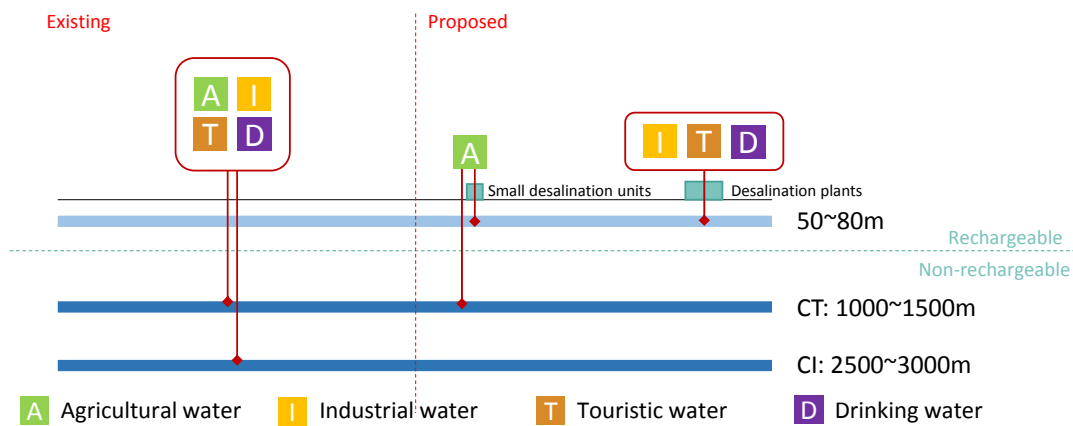


Figure 4.4-2 Simplified diagram of the switching in exploitation of groundwater resources in the South-West region in Tunisia

In the South-East, as shown in the Figure 4.4-3 below, the goal is to reduce the load on deep water tables, and get back to a groundwater table exploitation rates below 100% in order to achieve an effective sustainable recharge. In view of the proximity of the coast, an option would be to use desalination plants of seawater to supply the totality of industrial, tourist, and domestic water. Agriculture could then continue to tap into consequently rebalanced groundwater tables.

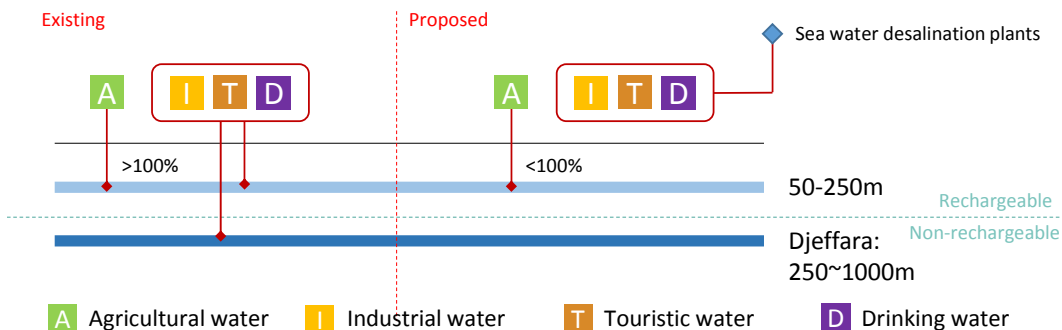
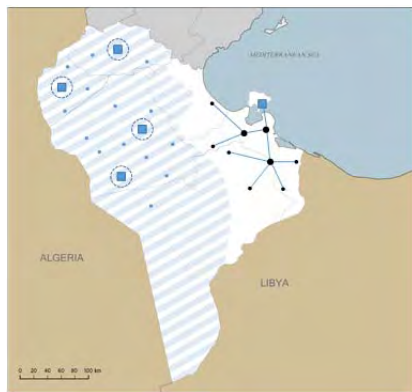


Figure 4.4-3 Simplified diagram of the switching in exploitation of groundwater resources in the South-East region in Tunisia.

³² “Touristic water” stands for “Drinking water for touristic use” while “Domestic water” stands for “Drinking water for domestic use”.



To conclude and summarize these two approaches, as shown in Figure 4.4-4, sustainable management of groundwater resources can be imagined based on two distinct models: autonomy on the one hand, and connection to the network on the other. In the Southwest, a switch to groundwater tables could be made possible through self-sufficiency in terms of desalination of intermediate cities³³ and sporadic small-scale support to farmers³⁴. In the South-East, the operation of a few big scale desalination plants of seawater on the coast line could supply necessary resources to irrigate the entire hinterland through the dense network of existing pipelines.

Figure 4.4-4 Schematic map of distinct models for sustainable management of water resources

(2) Depollution of industrial centres

In view of the degree of the severe pollution levels reached in the industrial centres of Gabès and Gafsa, and their impact on human health, it is necessary, even before considering any future development, to give priority to depollution efforts in these regions.

It is a large-scale problem both temporally and spatially. Indeed, industrial pollution related to the extraction and exploitation of phosphate began decades ago. Administrations, scientists, donors, and even the general population are well acquainted with this phenomenon. Discharges of phosphogypsum in the Mediterranean Sea are such that neighbouring European countries seriously worry about their long-term and large-scale effects. In this regard, the European Investment Bank has funded a project of Environmental remediation of the Gulf of Gabès for the amount of EUR 45 million³⁵.

The depollution process is currently under way in technical terms by Groupe Chimique itself, which is seeking funding for its programme of projects aiming at the reduction of emissions, but also in terms of institutional framework with, for example, the ongoing project of the European Union aiming at strengthening environmental governance³⁶ for which the ODS plays a central role.

Our project can possibly contribute to the depollution process by moving forward action plans that fit in concordance with the actions of other donors and institutions.

(3) Better distribution of the economic benefits to local populations

Considering the possible consequences of job related pressure that can lead to a social crisis in areas where there is not a sufficient number and diversity of companies³⁷, it is appropriate, in our study, in a

³³ This includes also what SONEDE is trying to achieve through a project funded by Kfw, see paragraph 6.2.1.(1).(c).(v) (Part I) for details.

³⁴ The OSS has conducted successful pilot projects in this direction during the phase III of the SASS, see *Final report of the first campaign of the component "agricultural demonstration pilots" in Algeria, Libya and Tunisia*, OSS, 2012.

³⁵ *EIB is financing a project to improve the environment on the Tunisian coast* EIB, 2004 (http://europa.eu/rapid/press-release_BEI-04-76_fr.doc)

³⁶ *The European Union for better environmental governance in Tunisia* European Commission, 2014 (http://europa.eu/rapid/press-release_MEMO-14-25_fr.htm)

³⁷ The governorate of Gafsa, in particular, has shown in recent years by a certain fragility of relations between different groups. Indeed, during the summer of 2011, violence has exploded in several locations of the governorate, particularly in the town of Metlaoui, where intercommunity confrontations caused 13 dead and about one hundred injured on June 6, 2011.

The conflicts of Metlaoui, which opposed two family clans (*a'rouch*), are in fact related to a misunderstanding during a recruitment process in the large local mining company. The company received 14,000 applications for 3,000 positions to be filled. The employment pressure being extremely strong in this region, the social situation can therefore deteriorate and lead to conflict.

perspective of prevention of new social conflicts, to consider a model for the local economy that prevents dependence of a large population on one company or one sector, which offers a fine-grained analysis of the territory ensuring as much as possible a dense and varied entrepreneurial fabric.

4.5 Third phase of the SEA: Prediction and evaluation of environmental impacts of the strategies, plans and action plans

Following the environmental diagnosis and the elaboration of the matrix of potential impacts, which constituted respectively the first and second phases of the Strategic Environmental Assessment (SEA), it is now important, in a third and last phase of the evaluative process, to question the strategic orientations set by the project in the light of environmental issues.

Carried out in parallel of the preparation of the core development plan, the iterative nature of the SEA allows to adapt the planning orientations and the development strategies, adjust them gradually³⁸, and propose necessary supporting measures. By identifying the possible environmental impacts of the future development, the evaluation helps identify possible room for manoeuvre that the development plan can further promote.

After having (4.5.1) identify the priority criteria for impact evaluation, (4.5.2) the environmental evaluation of alternative regional development scenarios, and then (4.5.3) the evaluation of direct, indirect and cumulative impacts of the selected scenario is realized. Finally, (4.5.4) enhancement measures for positive impacts and suppression, reduction, and mitigation measures for negative impacts, are proposed and a (4.5.5) framework for monitoring is established. Finally, the results of the SEA and some recommendations towards further environmental studies will be mentioned (4.5.6).

4.5.1 Identification of the priority criteria for impact evaluation

In order to test the environmental impacts of the development plan and to compare the effects of different scenarios and alternatives, various criteria are identified.

Basically the environmental and social categories and items required by JICA guidelines will all be evaluated, but some arrangements will be done in order to increase intelligibility. Indeed, some of the most relevant items (selected on the basis of the results of the identification of the potential impacts of the project done during the 2nd phase of the SEA, see matrix in Figure 4.4-1) will be merge into “priority criteria”, which best take into consideration the local circumstances and concerns, other might be omitted. For example, the category of “infectious disease” of the JICA guidelines is not quite relevant in the framework of regional planning and thus might be omitted, while the criteria of “water resource depletion” shall be carefully analysed in the context of Southern Tunisia.

The achievement of criteria is normally measured by indicators. Where possible, those environmental indicators will be expressed in measurable terms. For example, a criteria of “reduce greenhouse gas emission” could be expressed as an indicator of “reduce CO2 emissions by 12.5% by 2035”. However,

In conclusion, although tensions have eased in Metlaoui since these events of 2011, it is advisable to draw lessons and well consider that the fragile situation is not a consequence of cultural or social differences that may arise sporadically, but that the real root of the problem is to find in the long-established unbalanced local economic model.

³⁸ A preliminary assessment was conducted on the strategies and plans of agricultural and industrial sectors developed at the stage of the Interim Report. This internal evaluation consisted of the analysis of sector strategies and plans and of the formulation of recommendations for improvement towards a more sustainable development, contained in "Environmental Issues Integration Reports" submitted to the concerned experts.

since regional planning is mostly based on abstractions, indicators may be expressed in qualitative terms most of the times. Criteria and indicators can often be derived from environmental protection objectives identified in other plans and programmes, such as the Sustainable Development Indicators (Indicateurs de Développement Durable) of Tunisia.

The following Table 4.5-1 shows the identified priority criteria and their relative indicators.

Table 4.5-1 Priority criteria, strategic objectives and possible indicators

Proposed priority criteria	Strategic objectives	Possible indicator
Water resource depletion	<ul style="list-style-type: none"> • Preserve water resources, especially of non-rechargeable, fossil nature • Develop water-saving technics and sustainable use of water resources in all sectors • Improve the sustainable management of water resources in all sectors 	<ul style="list-style-type: none"> • Exploitation rate of groundwater • Water use (by sector), availability and proportions recycled • Added-value of one cubic meter (by product, by sector) • Reuse rate of wastewater by sectors
Pollution (air, water and soil)	<ul style="list-style-type: none"> • Preserve the environment from all kinds of pollution • Reduce respiratory illness • Improve the mastering of green technologies • Improve environmental management 	<ul style="list-style-type: none"> • Greenhouse gas emission rate • Rate of production of dangerous industrial waste • Industrial waste recycle rate • Investment realized for acquiring eco-friendly production technologies • Number of ISO 14 001 certification delivered to industrial companies
Biodiversity conservation	<ul style="list-style-type: none"> • Avoid damage to designated wildlife and protected species • Maintain biodiversity, avoid irreversible losses 	<ul style="list-style-type: none"> • Reported levels of damage to designated sites or species • Reported conditions of important wildlife sites, national parks etc.
Employment and poverty	<ul style="list-style-type: none"> • Ensure job opportunities for various categories of the population • Reduce poverty • Promote sustainable job opportunities that can guarantee a stable social climate 	<ul style="list-style-type: none"> • Poverty rate • Number of newly established companies • Variety of sectors concerned by job opportunity creation
Distribution of benefits and damages	<ul style="list-style-type: none"> • Ensure a good spatial distribution of the benefits and damages • Ensure a good distribution of the benefits and damages between currently living population and future generations 	<ul style="list-style-type: none"> • Amount of investment done for improving economic activities outside of regional capitals • Amount of investment done for improving accessibility of remote areas

Source: JET

4.5.2 Evaluation of alternative regional development scenarios

Within the framework of SEA, the assessment of alternative scenarios is made in broad terms against the environmental priority criteria. In order to build a relevant comparison on both spatial and time frameworks, indirect, cumulative, short, medium and long-term effect will be assessed.

Regarding the other aspects of the evaluation and comparison of scenarios, that is to say from the economic and social aspects, as well as a general summary of the three aspects, refer to Chapter 2.1.3.

The following Table 4.5-2 shows the results of the comparison of scenarios through environmental priority criteria.

Table 4.5-2 Comparison of scenarios through environmental priority criteria

	Scenario 1: Private initiative/ cluster development					Scenario 2: Private initiative/ concentrated development					Scenario 3: Public initiative/ cluster development				
	General impact	Short term	Mid term	Long term	Comment	General impact	Short term	Mid term	Long term	Comment	General impact	Short term	Mid term	Long term	Comment
Water resource depletion	A-	C-	B-	A-	The spatial spreading of the development all over the region will create the need to build new infrastructures for economic activities and for human dwellings. Spreading activities will be problematic in the places where the water resource is already rare or overexploited, especially in the South-West, where the sustainability of the water resource is seriously threatened. Thus, more and more shallow aquifer desalination plants will have to be built to support the needs of industrial developments and of consequent urbanization on the long term, and this will have colossal financial and environmental costs.	B+	B+	C+	C-	The concentration of the developments on the coastal strip will lead to the increase of the water demand in a region where the renewable water resource is already broadly overexploited and even forbidden to draw. There will thus be a necessity to switch to new forms of water resource, and the proximity of the Mediterranean Sea will provide almost unlimited possibilities of water supply through the building of new seawater desalination plants. However, on the long term, there is a risk that the high concentration of all types of activities and the consequent urbanization might threaten the ecological balance of human dwellings and that the capacity of water supply management might be exceeded.	B+	B+	B+	B+	Based not only on the newest desalination technologies but also on the requalification of the traditional water conservation systems such as Jessours, public administration will use its strong commitment to elaborate a long-term planning, in terms of quality and quantity, of the water resource, will help to build a relevant framework for sustainable use and management of this natural resource. Since the greatest economic growth is expected on the mid/long term, there is a hope that sustainable solutions in terms of natural resource management will be found gradually together with the economic and social considerations.
Pollution (air, water and soil)	B-	C-	B-	B-	The dispersion of industries in the rural areas will make the control and regulation of the wastes and discharges of all the polluting units more difficult. In addition, the distance created between production, transformation and export centres will lead to the increase of travels by cars or trucks and consequently to an increase of pollution and CO2 emissions.	C+	C+	C+	C-	In the short term, pollution control and depollution can be promoted among industrial clusters as they are concentrated in the coastal areas with comparatively larger companies. Besides, in the long term, it will become difficult to attain thorough pollution control because of scattered cluster distribution over the Southern Region with small companies.	C+	C-	C+	B+	Public administration can encourage companies in industrial clusters to control pollution and depollute existing contamination with strong involvement, while the efforts on pollution control have to spread over the Southern Region. In the short term public administration will face difficulty due to the scattered cluster development. In the long term, however, pollution control is expected to be well organised because clusters are to be fully developed with agglomeration of similar companies.
Biodiversity conservation	B-	C-	B-	B-	Uncontrolled discharge, in rivers and wadis, of chemical pollutants from dispersed industries, as well as increased road traffic might cause disturbance of the fauna and flora of the whole region.	C-	C+	C+	B-	The construction of numerous desalination plants on the shoreline might lead, in the long term, to the disturbance of the fragile coastal wetlands and on the marine biodiversity, because of both the construction of the infrastructure itself, but also the discharge of high salinity brine to the natural environment.	B+	B+	B+	B+	The planning of clusters by the public administration will allow to take into consideration the environmental sensibility of every parts of the region, and thus, make specific arrangements to ensure that there will be no loss of biodiversity or habitats.

	Scenario 1: Private initiative/ cluster development					Scenario 2: Private initiative/ concentrated development					Scenario 3: Public initiative/ cluster development				
	General impact	Short term	Mid term	Long term	Comment	General impact	Short term	Mid term	Long term	Comment	General impact	Short term	Mid term	Long term	Comment
Employment and poverty	C+	C+	C+	B+	This scenario can generate positive impacts, but it needs to be qualified. Indeed, let private investors take care of development can lead to bad strategic choices in terms of economic benefits and jobs creation. It is highly possible that sectors that only have little impact in terms of local employment, such as the extraction of oil or gas, are favoured by private investors.	B+	B+	B+	C+	The concentration of development can, in coastal areas, guarantee efficient job and wealth creation in the short term, particularly because of the availability and proximity of various functions in the urban area. However, it would be difficult to expand development over inland areas in the long term.	B+	C+	B+	B+	Thanks to the planning efforts of public administration, wealth creation by the private sector will benefit most effectively to job creation in the long term. Furthermore, the focus on R&D will notably promote the emergence of innovative sectors and new type of jobs.
Distribution of benefits and damages	C+	C+	C+	B+	This scenario may have positive impacts, but it needs to be qualified. Indeed, the spatial dispersion of the developments will benefit a large part of the southern Tunisian areas, regardless whether coastal or Saharan. However, giving priority to the market with minimal public intervention could lead to an unequal spatial development which benefits only the territories that have a successful economy. Without solidarity mechanism, landlocked areas or areas with reduced economic activity would be excluded from development.	A-	A-	B-	C-	The concentration of activities on the coastal area may lead to a bad distribution of positive economic impacts, benefiting an urban minority located on the east coast, while the populations of the interior and the West will be set aside the development. Although an extension to these areas is planned and thus limit the bad distribution on the long-term, it is conceivable that corporate headquarters and initiative remain concentrated in the coastal zone, limiting the rise of inland regions.	B+	C+	B+	B+	Inter-sectoral and inter-regional cluster planning will ensure both the emergence of flourishing economic activities in the interior regions as well as in the coastal regions, but also, thanks to the monitoring by the public administration, the regional disparities might be levelled through solidarity mechanisms which will ensure to the most deprived areas a minimum infrastructure development.

A+/-: Remarkable Positive/Serious Negative Impact is predicted.
 B+/-: Positive/Negative Impact is expected to some extent.
 C: Extent of Impact is unknown. (A further examination is needed and the impact could be defined as study progresses.)
 D: Impact is very small or nil and further survey is not required.

Source: JET

4.5.3 Evaluation of direct, indirect and cumulative impacts

Based on the matrix of identification of potential impacts described in the second phase of the SEA as a baseline information, the evaluation of direct, indirect and cumulative impacts of the sectorial and infrastructure developments have been undergone.

It shall be clarified that, depending on the case, impact evaluation is not only performed in strict absolute terms, but relatively to the incidence that the proposed development will have on the reality. In short, as it is one of most important objective of SEA, it will be evaluated whether or not environment issues have been integrated, at the strategic level, in the sectorial developments. For example, if an impact is detected within the perimeter of a Protected Area, it will be signalized in absolute terms. Inversely, if one sector do not take any water-saving measure for sustainability, and another one have a strong planning for water resource, the first sector will have a worse evaluation than the second, even though, in absolute, its volume of water consumption is smaller than the second sector.

In addition, due to the complexity of the three major productive sectors and of transportation infrastructure and from the fact they respectively concern a great variety of sub-sectors (for example dates, olive, arboriculture, vegetables, livestock breeding, fishery and food processing for agricultural sector; road, railway, port and airport for transportation infrastructure), the impacts of those four sectors will be evaluated for each environment criteria, independently.

The other development planned in the field of water supply and waste water treatment as well as power and telecommunications, representing less complex propositions, will be assessed globally.

The following table shows the summary of the results of the evaluation of direct, indirect and cumulative impacts for all the concerned sectors.

Table 4.5-3 Summary of the results of the evaluation of direct, indirect and cumulative impacts

		Sectorial development strategies			Infrastructure development strategies
		Agricultural development	Industrial development	Tourism development	Transportation infrastructure
Priority criteria	Water resource depletion	B+	A-	C-	D
	Pollution (air, water and soil)	B+	C+	D	C-
	Biodiversity conservation	B-	B+	B+	B-
	Employment and poverty	A+	B+	B+	A+
	Distribution of benefits and damages	B+	C+	A+	A+
Other criteria	Waste management	A+	n	B+	n
	Noise and vibration	(D)	C-	(D)	B-
	Offensive odors	C+	B+	(D)	(D)
	Geology, topography, soil	n	(D)	B-	n
	Hydrology, hydric erosion	n	(D)	n	n
	Protected area	B-	D	D	C-
	Involuntary resettlement	B-	B-	D	B-
	Social institutions	(D)	(D)	B+	A+
	Specific lifestyles	(D)	(D)	A+	(D)
	Local conflicts of interest	B+	B-	n	(D)
	Gender	(D)	(D)	B+	(D)
	Children's rights	(D)	n	(D)	(D)
	Cultural heritage	(D)	(D)	A+	(D)
	Landscape	A+	B-	A+	B-
Working conditions	(D)	n	(D)	n	

Note: A+/-: Remarkable Positive/Serious Negative Impact is predicted.
 B+/-: Positive/Negative Impact is expected to some extent.
 C: Extent of Impact is unknown. (A further examination is needed and the impact could be defined as study progresses.)
 D: Impact is very small or nil and further survey is not required.
 (D): Impact considered very small or nil in the impact prediction matrix.
 n: Not relevant.

The following tables show the results of the evaluation of direct, indirect and cumulative impacts for all the concerned sectors, on short, middle and long terms (respectively 2020, 2025 and 2035).

Table 4.5-4 Evaluation of direct, indirect and cumulative impacts of Agriculture, fishery, livestock breeding and food processing sector

		Impact prediction						Impact assessment						
		1. dates	2. olive /olive oil	3. arbor./vegetables	4. livestock	5. fishery	6. agro-processing	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Priority criteria	Water resource depletion	A-	C-	C-	C-	C-	C-	B+	C+	B+	C+	(+) Even though the technical and particularly the financial feasibility still have to be proved, the introduction of water-saving techniques for dates agriculture, through the development and dissemination of drip irrigation system (AG-1-1), will definitely have positive impacts on the water resource, and especially on non-renewable deep fossil groundwater. (-) Still, other measures of water saving, not necessarily at the level of the plot, but at a larger scale, such as the improvement of pumping and transport (canals) infrastructure, might have been proposed. Also, the activation of triple-layered oasis agriculture (AG-6-1) might have a positive impact on water conservation, but since the target of this plan is not clear (pilot or large-scale implementation?), the result in terms of water resource preservation cannot be evaluated.		
	Pollution (air, water and soil)	D	C-	D	C-	D	B-	B+	B+	B+	C+	(+) The promotion of organic agriculture for olive cultivation (AG-2-2) will initiate the limitation of the use of agricultural inputs, pesticides and fertilizers and then consequently will lead to the reduction of soil contamination and underground water degradation. (-) It is likely that the expansion of food processing installations and especially fishery product processing facilities will lead to a degradation of water quality, due to discharges of industrial wastewater.	The addition of food-processing industries, and especially of dairy product processing, which have a high impact in terms of water pollution, to the already polluted urban region of Gabès region, will lead to the cumulation of the pollution and to the saturation of industrial water treatment capacity. Indeed, no additional WwTP is planned in Gabès (WA-4).	-
	Biodiversity conservation	B-	B-	C-	B-	A-	D	B-	C-	B-	B-	Even it has been considered the option of promoting various promising species (AG-4-1), some efforts shall have being done through the consideration of different varieties within the same species. The limitation of generic species (Gabsi for pomegranate tree, Zidi and Saffouri for fig tree, Deglet Nour for dates) and inversely the promotion of the diversification of varieties and the use of local cultivars (Tounsi, Zehri, Garoussi for pomegranate tree, various vegetables local cultivars, a multitude of dates varieties such as in Chenini oasis) is a key to the conservation of the rich South Tunisian biodiversity. Also, it is regrettable that nothing is planned in terms of sustainable fishing technics. Fishery sector is currently responsible for the decrease of the exploited stocks of the Mediterranean Sea, the mortality of vulnerable species, and, generally, for significant upheavals of the concerned fragile ecosystems. There is a need of a radical change in fishing technics in order to limit the impact of this sector on the natural resource.		

		Impact prediction						Impact assessment						
		1. dates	2. olive / olive oil	3. arbor/vegetables	4. livestock	5. fishery	6. agro-processing	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Priority criteria	Employment and poverty	C+	C+	C+	C+	B+	B+	A+	B+	B+	A+	With the variety of sub-sectors concerned and numerous categories of producers targeted by the strategies, it is predictable that there will be a general positive economic impact and a significant reduction of the poverty. In addition, the introduction of various new technologies and organizations will definitely create new job opportunities for young and university graduates. Again, it is clear that the promotion of a second crop to grow during a different period, taking advantage of hot spring water and geothermal greenhouse (AG-4-1) will have a beneficial impact on the income of farmers.		
	Distribution of benefits and damages	D	D	D	D	D	D	B+	C+	B+	B+	(+) The spatial distribution of benefits is quite good, with localization of food-processing facilities and research centers in regional capitals of both South-East and South-West. Also, the re-evaluation of traditional irrigation systems of Jessours (AG-4-2) will benefit to remote mountainous areas of Gabes, Medenine and Tataouine. (-) In addition to cities, the most threatened agriculture environments that lacks activity might have been the target of revitalization efforts. Not considering large-scale industries that need the proximity of cities and basic infrastructure, some more small-scale "flagship" developments might have been proposed in the vicinity of cultivation environments (for example direct sales at the farm, eco-friendly research center in a threatened oasis etc.).		
Other criteria	Waste management	D	B-	D	D	B-	B-	A+	B+	A+	A+	The promotion of circulative use of local organic substances (AG-5-3) will have a positive impact on the waste management capacity of all the components of the agricultural sector. It is especially the olive oil production sector, which have major environmental impacts with its residue (olive pomace), which will benefit from the effort of waste recycling.		
	Offensive odors	D	C-	D	D	C-	C-	C±	C±	C±	C±	It is likely that the installation of slaughter houses and food processing facilities, and in the first place fishery product processing plants, will lead to a proliferation of flies and bad odours in the vicinity. (+) However, the effort of promotion of circulative use of local organic substances (AG-5-3) will have a positive impact on the reduction of the risk of diffusion of offensive odors that comes from the bad management of solid waste (uncontrolled fermentation etc.). (-) Still, offensive odors have also other origins, such as the bad management of the hygiene of the general processing cycle, or the stagnation and not efficient treatment of the industrial wastewater.		
	Protected area							B-	B-	B-	B-	The expansion of fish and shrimp farms for larger production located on the shoreline of Medenine and Djerba might have a disturbing impact on the fragile ecosystems of the Ramsar sites of Djerba Guellala (23km ²), Djerba Bin Al Ouedian (121 km ²) and Bahiret el Bibane (393 km ²). Indeed, intensive aquaculture uses chemicals, fertilizers and antibiotics that have a harmful impact in terms of marine pollution.		

		Impact prediction						Impact assessment						
		1. dates	2. olive / olive oil	3. arbor.Vegetables	4. livestock	5. fishery	6. agro-processing	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Other criteria	Land tenure issues							B-	C±	C-	B-	The establishment of a law that permits the expansion of dates cultivation area (AG-1-4) might lead not only to land grabbing in a region where land tenure is not clear, but it would also opens the door to an already existing phenomenon: land speculation. With the adoption of the law, it is imaginable that land speculators buy cheap land, equip it with drop irrigation, and sell the land while benefiting from the bonus of land expansion to start a new speculation cycle.		
	Local conflicts of interest	D	D	D	D	D	D	B+	C+	C+	B+	The promotion of the establishment of farmers groups such as cooperatives and mutual companies (AG-4-3) or breeders group (AG-3-3), even they might take time to become effective, by bringing together individual interests into a single collective interest, will have a positive impact in terms of social and economic solidarity between farmers, and will thus reduce the local conflicts of interests.	Even if the cooperative might federate the interests of the members of the same group, two types of indirect impacts might be identified. First, the farmers that have been excluded from the cooperative, for any reason, might have an envious feeling and might want to disturb the balance of the group. Second, some conflicts of interest might arise inside the group between cooperative associates, if the decision-making system, and the system of distribution of remuneration is not clearly defined.	-
	Landscape	C+	C±	D	D	D	D	A+	B+	A+	A+	The promotion of triple-layered oasis agriculture (AG-6-1), especially by the rehabilitation and improvement of traditional irrigation infrastructure (canals etc.), will have a positive impact on the reconstitution of traditional oasis landscape. Also, the re-evaluation of traditional irrigation systems of Jessours (AG-4-2) will ensure the perpetuation of some of the most picturesque rural landscape of Southern Tunisia.		

Note: A+/-: Remarkable Positive/Serious Negative Impact is predicted.
 B+/-: Positive/Negative Impact is expected to some extent.
 C: Extent of Impact is unknown. (A further examination is needed and the impact could be defined as study progresses.)
 D: Impact is very small or nil and further survey is not required.

Table 4.5-5 Evaluation of direct, indirect and cumulative impacts of Mining and other industrial sectors

		Impact prediction			Impact assessment						
		1. Mining /Constr.	2. Textile	3. Chemical Ind.	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Priority criteria	Water resource depletion	A-	A-	B-	A-	B-	A-	A-	Additional industrial development will have a serious impact on the exploitation of the water resource, especially in the regions of El Hamma, Gafsa and Tozeur, which groundwater is already overexploited, or in Kebili, where the resource of renewable water is limited. In addition, nothing is planned to reduce water resource depletion for the current and planned industrial facilities.		
	Pollution (air, water and soil)	A-	B-	A-	C+	C+	C+	B+	(+) The establishment of low pollutant emission productions system in the chemical industry (MN-3-2) together with the depollution of the Gafsa and Gabes industrial regions as a short-term priority (five-year spatial development plan) will lead to an important reduction of the various forms of pollution created by the chemical industry. (-) However, it shall be pointed out the lack of consideration for other polluting sub-sectors, such as textile. Again, some mechanism ensuring the consideration of environment on the long term might have been proposed.		
	Biodiversity conservation	B-	D	A-	B+	B+	B+	B+	The establishment of low pollutant emission productions system in the chemical industry (MN-3-2) together with the depollution of the Gafsa and Gabes industrial regions as a short-term priority (five-year spatial development plan) will lead to an important reduction of the industrial discharges that are usually dumped in receiving water bodies such as oueds (wadis) or the sea, and which lead to biodiversity disturbance and ecosystem destruction. Similarly, the establishment of a recycling system for plastics (MN-3-1) will have a positive impact on the limitation of plastic materials lost in the natural environments and which consist in a threat for biodiversity.		
	Employment and poverty	B+	B±	B+	B+	B+	B+	B+	It is predictable that the strategies proposed will generate a general positive economic impact and a significant reduction of the poverty. The introduction of various new technologies for example in the green and the recycle industry, will definitely create new job opportunities for young and university graduates. Finally, it is clear that upgrading the production activities of the textile sector (MN-4) will help to structure the sector for more independence towards foreign investments and then will secure the employment.		

		Impact prediction			Impact assessment						
		1. Mining / Constr.	2. Textile	3. Chemical ind.	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Priority criteria	Distribution of benefits and damages	D	D	D	C+	C+	C+	C+	The richness in minerals does not obey to a urban/rural or coastal strip/remote hinterland logic and thus can benefit randomly to some vulnerable communities. The conduction of comprehensive surveys on each potential mineral resource (MN-2-1) will help to clarify the current situation of the resource, since, at the present state, no comprehensive inventory has been done at the national or regional level. In addition, the distribution of benefits shall be considered not only spatially, but also temporally in terms of preservation of the benefits for the future generations (see amplification measures).		
	Noise and vibration	A-	C-	C-	C-	C-	C-	C-	Nothing is planned for the consideration of noise and vibration for the planned industrial developments. It is especially the noise caused by the blasting on mining sites that will have to be assessed at the stage of eventual future EIA.		
Other criteria	Offensive odors	D	D	A-	B+	B+	B+	C+	The establishment of low pollutant emission productions system in the chemical industry (MN-3-2) together with the depollution of the Gafsa and Gabes industrial regions as a short-term priority (five-year spatial development plan) will have a positive impact on the reduction of offensive odors diffused by the chemical industry.		
	Protected area	C-	C-	C-	D	D	D	D	No impact is expected on protected areas.		
	Involuntary resettlement	B-	C-	B-	B-	B-	B-	B-	Impact is predictable. This aspect shall be well considered in the EIA of an eventual future feasibility study.		
	Indigenous or ethnic minorities	B-	D	D	B-	B-	B-	B-	Impact is predictable in the mining sub-sector but nothing is planned for the consideration of indigenous or ethnic minorities for the planned new developments. This aspect shall be well considered in the EIA of an eventual future feasibility study.		
	Local conflicts of interest	B-	D	A-	B-	B-	B-	A-	Impact is predictable especially in the chemical industry sector. As the environmental impacts of the chemical industry are well known to all citizens, there is a strong social refusal from the local communities regarding new installations. Serious and perennial conflicts of interest between investors and population might arise in the case of any planned industrial developments, which might be completely blocked by the social conflict.		
	Landscape	A-	D	A-	B-	B-	B-	B-	Impact is predictable in the mining sub-sector but nothing is planned for the conservation of landscapes for the planned new developments. This aspect shall be well considered in the EIA of an eventual future feasibility study.		

Note: A+/-: Remarkable Positive/Serious Negative Impact is predicted.
 B+/-: Positive/Negative Impact is expected to some extent.
 C: Extent of Impact is unknown. (A further examination is needed and the impact could be defined as study progresses.)
 D: Impact is very small or nil and further survey is not required.

Table 4.5-6 Evaluation of direct, indirect and cumulative impacts of Tourism and Handicraft sectors

		Impact prediction				Impact assessment						
		1. Mass, beach, meca	2. Saharan tourism	3. Agro & cultural	4. MICE & medical	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Priority criteria	Water resource depletion	B-	C-	D	D	C-	D	D	C-	Two main orientations of the development strategies of the tourism sector might have an aggravating impact on the water resource depletion, considering that average water consumption of tourists is an important charge. Firstly, by developing touristic sites (TM-3-5) and infrastructures (TM-2-3) in the inland and remote areas, the demand of water resource will expand geographically and might exceed the supply potential in some places. In addition, by promoting tourism at all seasons (TM-1), the chances for tourists to visit at a period of drought or low groundwater level are multiplied. Setting the tourism service level to meet the "international standards" (TM-2) might have a relatively strong impact on water resource, or might simply not be possible in an arid region already concerned by water limitation.		
	Pollution (air, water and soil)	C-	D	D	D	D	D	D	D	The type of tourism promoted in the strategies has no negative impact in terms of pollution, but in the contrary has no strong commitment to struggle against pollution, except for the proposed conduction of clean-up campaigns in order to prevent pollution and to control solid waste on tourist sites (TM-4-3).		
	Biodiversity conservation	C-	C-	D	D	B+	D	D	B+	The type of alternative tourism proposed in the strategies, including agro-tourism and cultural tourism, do not have negative impacts on the natural environment. Indeed, thanks to the establishment of new laws, standards and "cahier des charges" for the protection of the environment (TM-2-1) and the establishment of management plans for natural sites (TM-3-1), the conservation of biodiversity on the touristic sites might be strengthened.		
	Employment and poverty	C±	C+	B+	B+	B+	B+	B+	B+	All the efforts proposed for the development of new tourism services as well as increase of service quality will lead to significant job opportunity creation.		
	Distribution of benefits and damages	B-	D	D	D	A+	C+	B+	A+	The creation of the Destination "Terre – Bérbere" (TM-1), the improvement of transport infrastructure (TM-2-3) and of rural services (TM-4-5) as well as the valorization of cultural and natural heritage located in inland areas (TM-3) will all have a positive impact on the economic development of remote and mountainous areas of South Tunisia and thus on the spatial distribution of the benefits at the regional scale, even though its realization is dependent to the success of several factors and may be only effective on long-term. Finally, the limitation of "all-inclusive" hotels (TM-4-4) might foster a better balanced distribution of benefits in former mass tourism coastal region.	The economic growth created, consequently to the tourism attraction, might create indirect impacts in terms of acceleration of urban expansion in remote areas (building of hotels, restaurants, and habitations). Furthermore, the road network developed simultaneously might become the vector of unplanned ribbon urban sprawl. This urban expansion might threaten the fragile surrounding natural and cultural heritage.	-

		Impact prediction				Impact assessment						
		1. Mass, beach, meca	2. Saharan tourism	3. Agro & cultural	4. MICE & medical	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Other criteria	Waste management	B-	B-	D	D	B+	C+	B+	B+	The establishment, with the support of ANGED, of a "cahier des charges" dedicated to the management of solid and liquid waste for specific activities by private sector that may produce significant impacts on the natural environment, such as hotels and golf, (TR-2-1), will have a positive effect on the waste management of the sector in general and on the protection of the natural environment.		
	Geology, topography, soil	A-	D	D	D	B-	B-	B-	B-	The absence of proposition for the requalification of existing beach resort infrastructure and more generally the lack of commitment in transformation of beach tourism may lead to the continuation of the same negative impact of resort hotels on the coastal erosion and marine dynamics.		
	Protected area	B-	C-	D	D	D	D	D	D	No impact is expected on protected areas.		
	Involuntary resettlement	C-	D	D	D	D	D	D	D	No impact is expected on involuntary resettlement.		
	Social institutions	D	D	D	B±	B+	D	D	B+	Limited job opportunities in the tourism sector might create a feeling of jealousy in the population that is excluded from tourism jobs. As proposed, developing social services and institutions such as sanitation, medical and security infrastructure (TM-4-5) and road network to remote areas (TM-2-3) with the benefits of tourism may be a relevant safeguard to animosity and social conflicts.		
	Specific lifestyles	D	C-	A+	D	A+	C+	B+	A+	Minority groups, including the berber community, might be able to take advantage of the type of tourism proposed in the strategies, since cultural originality and local specificities are what the cultural tourists are looking for. In addition, the development of the Community Based Tourism (TM-4) will have a positive impact on the image of minority groups and on mutual understanding, thanks to the awareness raising campaign proposed and the self-determination on the long-term.		
	Gender	D	D	B+	D	B+	C+	B+	A+	The reinforcement of the traditional handicraft sector, that might be effective after the assistance of professional training course and official certification to artisans (TM-3-2), might benefit to women at first, since women are major actors of handicraft confection.		
	Cultural heritage	D	C-	A+	D	A+	A+	A+	A+	The development strategies not only focuses directly on the reinforcement of the cultural sites and intangible heritage (TM-3), but also, by giving cultural heritage a vector of employment opportunity for local population, they might intend the communities to understand the merit of transmitting most aspects of their culture (history, lifestyle, cuisine, hospitality etc.) to future generations and thus reinforce the symbolic value of cultural heritage.		
Landscape	A-	B+	A+	D	A+	B+	A+	A+	The development strategies not only gives a significant importance to well-known cultural landscapes of Southern Tunisia such as berber villages, medina and oasis (TM-3), but also valorize other type of landscapes that were not considered to have cultural value previously, such as the agricultural landscapes of olive groves or jessours (TM-5).			

Table 4.5-7 Evaluation of direct, indirect and cumulative impacts of Transport sector

	Impact prediction				Impact assessment							
	1. Roads	2. Railway	3. Ports	4. Airports	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend	
Priority criteria	Water resource depletion	D	D	C-	C-	D	D	D	No impact is expected on water resource depletion.			
	Pollution (air, water and soil)	B-	D	B-	A-	C-	C+	C-	B-	The improvement of public transportation infrastructure and capacity will have a positive impact on the reduction of the emission of CO2 through the change from individual (cars) to collective (bus, train, LRT) transportation mode of some of the inhabitants. Specific strategies for enhancing modal shifting, such as public awareness campaign or park'n'ride intermodal poles, might also have been proposed at the scale of traffic and parking master plan programmes (TR-3-8) in order to make a more perennial change on the long term. Furthermore, it is difficult to evaluate if the measures proposed for the limitation of the air pollution will be enough to alleviate the extension of the network, the construction of new roads in the middle term (TR-1-2), that will, consecutively to the growth of population and the increase of people buying vehicles, open the door to a broader traffic in the future. Similarly, the proposition of building a new airport in Tataouine on the middle term (TR-1-9) is questioning the future in terms of increasing CO2 emission on long term. Finally, even though the risk of pollution of soil and contamination of underground water due to the oil leaks on deteriorated pavement has been assessed in the diagnosis, this issue is not subject to any strategy, plan or action plan.		
	Biodiversity conservation	B-	B-	B-	A-	B-	B-	B-	B-	The planned development roads (paved roads) connecting El Borma to Borj Bourguiba and Bir Zar, which are crossing the National Park of Sanghar Jabbes, might cause disturbance and fragmentation of the habitats of the local fauna, namely Rhim gazelle (<i>Gazella leptoceros</i>), Dorcas gazelle (<i>Gazella dorcas</i>), Fennec fox (<i>Vulpes zerda</i>) and Houbara bustard (<i>Chlamydotis undulata</i>). Because of a wide right-of-way of airports, the construction of a new airport in Tataouine (TR-1-9) might lead to important impacts of destruction of natural ecosystems.		
	Distribution of benefits and damages					A+	B+	A+	A+	All the efforts proposed in terms of improvement and extension of the infrastructure and especially the construction or rehabilitation of development roads in remote areas (TR-1-2 and TR-3-4) will have a major positive impact in terms of reduction of regional disparities.		

		Impact prediction				Impact assessment						
		1. Roads	2. Railway	3. Ports	4. Airports	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Priority criteria	Employment and poverty	B+	B+	B+	A+	A+	C+	A+	B+	Even the improvement of public transportation will create some job opportunities for drivers and in maintenance, the creation of a new airport in Tataouine (TR-1-9) might show the biggest economic impacts as a structuring infrastructure at the regional scale. Indeed, airport activity is a remarkable economic booster because of the significant creation of jobs and businesses in the surrounding area, which represents a great opportunity for local authorities, as development will generate new resources in terms of professional and property tax. An airport can also bring jobs to both university graduated, and less qualified populations. On the long term, the airport will have to adapt to the new needs of the users and population, and involve to eventually become a commercial and business hub.		
Other criteria	Noise and vibration	B-	B-	B-	A-	B-	B-	B-	B-	Due to regular air traffic, the new airport to be constructed in Tataouine (TR-1-9) will cause permanent significant noise pollution. Noise pollution will certainly cause some fauna species to flee the area, in particular wild birds, leading to a disruption of the food chain in local ecosystems. In addition, all the works related to roads and railways will cause vibrations in their construction phase.		
	Protected area	D	D	D	D	C-	C-	C-	C-	The proposed new railroad and "Chott Center" including various solid constructions (museum, shops etc.) in the middle of the Chott El Jerid (TR-5-10) is situated inside the Ramsar site of "Chott El Jerid" (586 ha). Even though this Ramsar site still do not have any particular conservation measure (legal protection, management plan), it shall be planned, in subsequent feasibility studies, to ensure that: firstly, the proposed new rail transit will not disturb flora and fauna remarkable richness of the wetland (especially migratory birds); secondly, given the regional importance of the Chott in terms of underground water equilibrium, it should be ensured and strictly controlled that human activities do not generate any wastewater or solid waste discharge that might pollute groundwater, especially in a context of non-connection of buildings to the miscellaneous water networks. Furthermore, the planned development roads (paved roads) connecting El Borma to Borj Bourguiba and Bir Zar are crossing the National Park of Sanghar Jabbes. Causing disturbance and fragmentation of the habitats of the fauna, the proposed road development shall be first reconsidered in strategic terms, and then tested against the relementation of the National Park in order to understand its feasibility or not. In addition, it shall be well considered in the eventual future EIA of the feasibility study of the construction of the highway between Medenine and Ben Guerdane that the construction works do not disturb the fragile ecosystem of Bahiret el Bibane, classified as Ramsar site.		

		Impact prediction				Impact assessment						
		1. Roads	2. Railway	3. Ports	4. Airports	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Other criteria	Involuntary resettlement	B-	B-	B-	A-	B-	B-	B-	B-	The new airport to be constructed in Tataouine on a large surface (TR-1-9), the construction of a new 2x2 lanes bridge between Jorf and Bac Ajim (TR-1-10) and the construction of roads, especially in the surrounding of populated urban centres, like the ring road of Medenine (TR-1-8), are all proposition that might imply potential expropriation of many neighbouring residents.		
	Social institutions	B+	B+	D	D	A+	C+	B+	A+	All the efforts proposed in terms of improvement and extension of the infrastructure and strengthening of public transportation will have a major positive impact in terms of social wellness. Examples of beneficial impacts following road construction include the improvement of accessibility to employment, to education and healthcare, trade promotion and trade development, as well as social cohesion.		
	Landscape	C-	D	A-	A-	B-	B-	B-	B-	In first place, it is predictable that the construction of a new 2x2 lanes bridge between Jorf and Bac Ajim (TR-1-10) will have serious impacts on the particularly peaceful and untouched landscape of the Gulf of Boughara, which might lose its touristic interest with the construction of the bridge. In addition, the new airport to be constructed in Tataouine (TR-1-9) will cause major and perenial impacts on the local arid landscape. The landscape protection of both operations shall be well followed in their respectful EIA.		

Note: A+/-: Remarkable Positive/Serious Negative Impact is predicted.
 B+/-: Positive/Negative Impact is expected to some extent
 C: Extent of Impact is unknown. (A further examination is needed and the impact could be defined as study progresses.)
 D: Impact is very small or nil and further survey is not required.

Table 4.5-6 Evaluation of direct, indirect and cumulative impacts of other sensitive sectors of development

	Impact assessment						
	General impact	Short term	Mid term	Long term	Comment	Indirect / cumulative impact	Trend
Desalination plants	C-	C+	C-	B-	In order to meet the water needs of the planned development of the different sectors, the use of desalination of seawater (in the eastern coastal region) and of brackish groundwater (in the western part) has almost become a prerequisite in southern Tunisia. It is planned that the volume of desalinated water will increase about 6 times between 2015 and 2035 (from 70,800 to 414,000 m ³ / day), which will greatly change the configuration of the water supply, especially for households. Impacts are expected especially in terms of discharge of brine, created from the reverse osmosis process, in hydraulic receiving environments (rivers, sea). The fact that KfW is programming several operations almost simultaneously is reassuring regarding good decision-making and environmental protection in general.	In the eastern part of southern Tunisia, the planned increase of more than 4 times of the volume of desalinated water between 2015 and 2035 (from 70 800 to 314 000 m ³ / day) by the construction of no less than 4 new seawater desalination plants concentrated in a limited area (between Gabes, Djerba and Zarra) may cause long-term cumulative impacts on the marine environment of the Gulf of Gabes. Added to various pollutants from industry and disturbances related to the construction of new infrastructures (bridge of Djerba, Zarzis port), the impacts of desalination are likely to hurt biodiversity and the fisheries reserves, thus having a significant economic impact. To ensure a harmonious development of the coastal and marine area, we recommend the development of a detailed Strategic Environmental Assessment, focusing on desalination, specific to the Gulf of Gabes, including various technical studies (spatial modeling different releases GIS by brine, cumulative effects analysis etc.) as explained in the Chapter 4.6.	-

Note: A+/-: Remarkable Positive/Serious Negative Impact is predicted.
 B+/-: Positive/Negative Impact is expected to some extent.
 C: Extent of Impact is unknown. (A further examination is needed and the impact could be defined as study progresses.)
 D: Impact is very small or nil and further survey is not required.

4.5.4 Mitigation and amplification measures

The following tables show the results of the mitigation measures for negative impacts and the amplification measures for positive impacts.

Table 4.5-8 Mitigation and amplification measures for Agriculture, fishery, livestock breeding and food processing sector

Affected item	Potential direct, indirect or cumulative impact	Impact level	Mitigation or amplification measures	Predicted efficiency
Biodiversity conservation	Implicit promotion of the use of generic varieties of vegetables and fruits leads to the threat of biodiversity richness	(-) average	The promotion of local species can be done by the establishment of labels of "controlled designation of origin" on the model of French AOC (Appellation d'Origine Contrôlée). The preservation of local biological heritage can become a major means for promoting agriculture in the South. It is crucial to ensure the conservation of the whole local biodiversity, since local species have a multitude of roles, such as prevention of desertification, feeding livestock, having medicinal features etc. One idea, at the strategic level, for the protection of this natural heritage, shall be implementation of a GIS platform for the follow up of the resource, by overlapping conventions from different donors, and by sharing the elaboration of the vision with the citizens, in the continuity of the work done under the framework of IFAD's Program of Agropastoral Development and Promotion of Local Initiatives for the Southeast (PRODESUD). → Action plan has been modified according to this amplification measure (see AG-4-1-1: "Introduction and promotion of promising agricultural products"), except for the part on AOC.	(+) average
	Implicit promotion of usual intensive fishing practices leads to the threat of marine biodiversity.	(-) high	Small scale and sustainable fishing practices made possible for example by artificial reefs (especially by the JICA project in the region of Zarat and Sfax implemented in the years 2007/2008) has shown very good results in terms of quality with the resurgence of rare and almost extinct species. The economic shortfall here can be solved by giving an added value in terms of agro-tourism (small village of fishermen). Considering the serious situation of the fishery resource in the whole Mediterranean Sea, the switch to a sustainable fishing model at the scale of Southern Tunisia shall be properly evaluated. → Action plan has been modified according to this mitigation measure (see AG-4-2-2: "Renew and re-evaluation of existing agricultural equipment, materials, and systems").	(+) average
Protected area	The expansion of fish and shrimp farms might lead to disturbance of the fragile ecosystems of the Ramsar sites.	(-) high	There is a need of promoting the change from an intensive aquaculture model to a more sustainable form of aquaculture, especially in the surroundings of Ramsar sites, which might be impacted more. The Integrated multi-trophic aquaculture (IMTA) model, which provides the by-products, including waste, from one aquatic species as inputs (fertilizers, food) for another, shall be promoted. Fish and shrimp farms can for example integrate seaweed or shellfish to create biomitigation. → Action plan has been modified according to this mitigation measure (see AG-4-1-3: "Introduction and promotion of promising aquaculture products").	(+) average
Land tenure issues	The establishment of a law permitting the expansion of dates cultivation area might lead to the generalization of land speculation.	(-) high	One of the general objective of the strategies in the agricultural sector being the increase of value-added, it might be interesting to find other ways to achieve it than giving the possibility of increasing the cultivated area. Expansion of surface implies several drawbacks such as the extension of networks, natural land consumption, etc. Added-value can be increased through the densification and varification of production of existing dates production plots, for example by adding fruit trees or vegetables (realization of 3-layered oasis). Thus, the reward for using drop irrigation planned in the law would rather be to give the opportunity to easily have access to other forms of crops to mix with the dates tree (free supply of seeds, training of farmers by GDA, etc.) → Strategy has been modified according to this mitigation measure (see AG-1-4: "Provision of further financial and material support to farmers in proportion to physical productivity of water for dates").	(+) high

Table 4.5-9 Mitigation and amplification measures for Agriculture, fishery, livestock breeding and food processing sector (continued)

Affected item	Potential direct, indirect or cumulative impact	Impact level	Mitigation or amplification measures	Predicted efficiency
Offensive odors	In fishery product processing, bad management of the hygiene of the processing cycle, or the stagnation and not efficient treatment of the industrial wastewater leads to the diffusion of offensive odors.	(-) low	In order to avoid the emission of offensive odors, it might be necessary to plan precautionary measures of good management of the whole industrial process. First, it is recommended to install a cold room for temporary storage of fish wastes before valorization. It is also advisable to wash thoroughly and disinfect all the workstations, bins and dumpsters containing fish waste, and transportation carts. → Action plan has been modified according to this mitigation measure (see AG-5-3-2: "Establishment of rendering station for further reuse of organic waste as animal feed").	(+) very high
water resource depletion	Promotion of water-saving techniques for dates agriculture will have a good impact on water resource conservation.	(+) average	There might be a need to expand the promotion of water-saving techniques to not only dates agriculture but also other sub sectors of agriculture, and also to question and reconsider the nature of the water that agriculture is using, namely, deep fossil non-rechargeable water. The switch to different types of water resource to be used for agriculture might be proposed as another way to ensure fossil water preservation. As an example, some researches are currently implemented on vegetable species that can be grown on high salinity soils and with high salinity water. The promotion of this technology might make possible the use of salty water from sebkhas shallow aquifers and then the limitation of the exploitation of non-renewable deep fossil aquifers. → Action plan has been modified according to this amplification measure (see AG-4-1-1: "Introduction and promotion of promising agricultural products").	(+) high

Table 4.5-10 Mitigation and amplification measures for Mining and other industrial sectors

Affected item	Potential direct, indirect or cumulative impact	Impact level	Mitigation or amplification measures	Predicted efficiency
Distribution of benefits and damages	The conduction of comprehensive surveys on each potential mineral resource will help to clarify the current situation of the resource.	(+) low	A way to amplify the understanding of the potential of mineral resource would be to conduct further studies on the resource sustainability. The preservation of natural resources for industrial activities is the key of sustainable development, in a way that the availability of resources shall be guaranteed to future generations. Currently, the lack of knowledge and planning leads to the extraction and the exploitation of various resources but without knowing how long it will last. Several plans to support a possible strategy on resource preservation would be as follows. First, surveys for the preparation of a mapping / inventory of sustainable and non-sustainable resources used by the industry in the region, with an estimation of their durability. Then, based on this inventory, the establishment of a "regional plan of resource utilization" that would forecast the exploitation critical threshold for renewable resources and the alternatives of substitution of one resource to another for non-renewable resources. Finally, in order to promote the environmental awareness and to help the companies that commit to change their way of consuming resources, a mechanism of financial support might also be established. → Action plan has been modified according to this mitigation measure (see "Conduct scientific studies on the potential minerals resources and its sustainable utilization" in MN-2-1).	(+) high
Landscape	Nothing is planned for the conservation of landscapes for the planned mining developments.	(-) high	The mining industry has a major impact on the landscape, especially with changes in landforms, excavations, dumps, and heaps of waste, which, given the absence of dense vegetation, tend to be spotted more clearly in flat arid regions. The restoration, after the exploitation of the mine, of the natural sites as they were before, shall be made mandatory, in particular in the management plan of industries willing to settle in the arid region of Southern Tunisia. → Action plan has been modified according to this mitigation measure (see "Promote investment in these sectors in socially and environmentally sustainable ways" in MN-2-1).	(+) high

Table 4.5-11 Mitigation and amplification measures for Mining and other industrial sectors (continued)

Affected item	Potential direct, indirect or cumulative impact	Impact level	Mitigation or amplification measures	Predicted efficiency
Pollution (air, water and soil)	Except from depollution, some mechanism ensuring the consideration of environment on the long term might have been proposed.	(+) average	<p>The depollution process or the introduction of technique to recycle phosphate gypsum are priority aspects to be taken into consideration. However, in order to achieve a more sustainable form of consideration of the environment in the industrial sector, the environmental management shall be introduced as a norm.</p> <p>It becomes crucial to promote clean production and ecological efficiency, and thus to encourage companies to introduce environmental management system based for example on the norm ISO 14001. The upgrade of companies to international environmental requirements can improve their image and their capacity to explore new markets. This might necessitate the establishment of advisory structures to assist companies in administrative procedures.</p> <p>In addition, in the case of a creation of a new industrial zone, the eco-conception labels for buildings and for the whole zone (ecological complementarity between industrial units) might be further promoted.</p> <p>→ Action plan has been modified according to this amplification measure (see "Promote firms to introduce environmental management system" in MN-3-2).</p>	(+) high
water resource depletion	Nothing is planned to reduce water resource depletion for the current and planned industrial facilities.	(-) very high	<p>Mining operations often require large quantities of water that is used to remove dust, separate the ore, and to treat it. As a result, in a region where water resources are extremely limited, the demand for water can greatly increase. Furthermore, installation of new enterprises and service industries, attracted in the region by the mining activity, would also contribute to an increase in the demand for water.</p> <p>Some simple measures might be taken, at the both scales of the region and of the industrial zone, to ensure the conservation of water resource. Some of them might include the collection and use of rainwater via small storage dams constructed inside the site of the mine, the increase of underground aquifer recharge potential by the creation of artificial wetlands and green spaces.</p> <p>Furthermore, regarding the textile industry, which is also a big water consumer, some technical measures such as the reuse of wash water from the rubbing of spinning or dyeing liquids can be taken for water resource preservation.</p> <p>→ Action plan has been modified according to this mitigation measure (see "Promote to introduce water saving technology to the firms in chemical and mining sectors" in MN-3-2). However, it shall be clarified that, even with the application of mitigation measures, water scarcity in the industrial sector is still a critical issue that is hardly avoidable. It will have to be deeply analyzed in the further studies.</p>	(-) low
Local conflicts of interest	Serious and perennial conflicts of interest between investors and population might arise in the case of any planned industrial developments, which might be completely blocked by the social conflict.	(-) high	<p>There is a need for introducing participatory planning approaches in order to ensure harmonious corporate-community relations for co-planning and monitoring. The participatory planning tools might include community forums (multi-stakeholder community groups gatherings), good neighbor agreement (co-produced commitments constructed and agreed between companies and communities), participatory budgeting (process in which local communities contribute to decisions regarding the allocation and monitoring of expenditures of company resources allocated for community development) etc.</p> <p>→ Action plan has been modified according to this mitigation measure (see "Promote investment in these sectors in socially and environmentally sustainable ways" in MN-2-1).</p>	(+) high

Table 4.5-12 Mitigation and amplification measures for Transport sector

Affected item	Potential direct, indirect or cumulative impact	Impact level	Mitigation or amplification measures	Predicted efficiency
Protected area	The planned development roads (paved roads) connecting El Borma to Borj Bourguiba and Bir Zar are crossing the National Park of Sanghar Jabbes.	(-) low	<p>In strategical terms, the importance given to El Borma-Bir Zar shall be increased (at the condition of modifying the alignment to outside the National Park) towards El Borma-Borj Bourguiba route, which shall be abandoned.</p> <p>In the case the feasibility of El Borma-Borj Bourguiba route is decided, mitigation measures shall be found in the EIA.</p> <p>→ <i>The alignment of the road has been modified according to this mitigation measure (refer to Figure 3.2-14)</i></p>	(+) high

4.5.5 Monitoring plan

The establishment of a monitoring plan is an important stage in the environmental assessment process. Indeed, the monitoring will allow to follow-up of the development plan throughout its implementation period. The monitoring will concern the most significant impacts, negative or positive, and also at the same time the mitigation and amplification measures.

In the continuity of the logic developed in the 1st phase of the SEA (Environmental Diagnosis) of not only considering the state of the environment, but of analysing both anthropic pressures and its impacts on the evolution of the environment, the monitoring plan will adopt the “Pressure-State-Response” framework originally developed by OECD. This framework merely states that human activities exert Pressures (such as pollution emissions or land use changes) on the environment, which can induce changes in the State of the environment (for example, changes in ambient pollutant levels, habitat diversity, water flows, etc.). Society then gives Response to changes in pressures or state with environmental and economic policies and programs intended to prevent, reduce or mitigate pressures and/or environmental damage.³⁹ Thus, the monitoring plan will propose different types indicators, whether on the Pressure, the State or the Response.

The monitor indicators are based as much as possible on the norms and indicators already developed by Tunisian authorities, and especially the one related to the fields that concern directly regional planning, promotion of productive sectors and development of infrastructure. Thus, the monitoring information will be searched in priority in the following existing sources (an “IND-” code will figure on the monitoring plan table for the indicators used):

- IND-1: Indicators of Sustainable Development in Tunisia (ANPE, 2014);
- IND-2: Regional Indicators of Improvement of Living Conditions (ANPE, 2010);
- IND-3: Indicators for a Sustainable Management of Water Resources (ANPE, 2009);
- IND-4: Environmental indicators (ANPE, 2008);
- IND-5: Indicators of Sustainable Industry (ANPE, 2006);
- IND-6: Indicators of Sustainable Tourism (ANPE, 2010).

In the case those indicators do not match the specificities of the impact, new indicators might be proposed.

Moreover, to be effective, the monitoring plan must be easy to use, realistic and achievable. This implies that the number of indicators should be reasonable, and focused on both the potential impacts of the regional development plan, and the capacity for the local authority to actually be able to do the monitoring. More detailed monitoring plans will be elaborated at the EIA level of the eventual F/S of different projects.

³⁹ OECD, *OECD core set of indicators for environmental performance reviews*. OECD Environment Monographs No. 83, 1993, Paris.

Table 4.5-13 Monitoring plan

Affected item	Major potential impact / mitigation or amplification measure	Indicator	Definition	Frequency	Source of data	Nature
Water resource depletion	Reduction of water consumption / establishment of sustainable use of water resource in agricultural sectors	Share of irrigated farmland equipped with water-saving technology (IND-1)	This indicator measures the proportion of irrigated agricultural land equipped with water-saving technology (sprinkling, enhanced and localized gravity systems, drip irrigation, etc.) on the total of irrigated agricultural lands.	Yearly	GDA / CRDA	Response
		Added-value of one cubic meter allocated in irrigated agriculture (IND-1)	This indicator measures the contribution of irrigation water on agricultural production: net added-value of irrigated agriculture / irrigation water consumption. It is expressed in TND / m3.	Every 2 years	GDA / CRDA	Response
	Reduction of water consumption / establishment of sustainable use of water resource in mining and industrial sectors	Intensity of water use in the industrial sector (IND-5)	This indicator measures the water consumption required for the manufacture of a product. It is the ratio between the water consumption of the industrial sector and its added value expressed at factor cost (constant prices 1990).	Yearly	DGRE	Pressure / Response
	Reduction of water consumption / establishment of sustainable use of water resource in tourism sector	Water consumption in cubic meters per tourist per night (IND-6)	This indicator measures the water consumption of tourists staying over night in accommodation facilities. It covers drinking water used for showers and bath, water for swimming pools, and irrigation water for green spaces and golf courses (the two last components are often covered by treated water).	Yearly	ONAS / INS	Pressure
Pollution (air, water and soil)	Reduction of all kinds of industrial pollution	Greenhouse gas emission (IND-5)	This indicator measures the emission of greenhouse gas.	Yearly	Réseau National de Surveillance de la Qualité de l'Air (ANPE)	State
		Industrial waste recycling rate (IND-5)	This indicator measures the rate of recycled industrial waste in relation to the total industrial waste.	Yearly	ANGED	Response
		Pollution load in treated industrial water	This indicator measures the amount of various pollutants in the industrial treated water discharged by ONAS waste water treatment plants and industrial zones in the environment.	Yearly	ONAS / Groupe Chimique, etc.	Pressure / Response
	Establishment of environmental management in the long term	Investments made for the acquisition of green industrial production technologies through a number of beneficiaries and amount of FODEP subvention (IND-5)	This indicator measures the investments made for the acquisition of green industrial production technologies by showing the number of beneficiaries of ANPE Depollution Fund (FODEP: FOND de DEPOLLUTION), as well as the amounts of grants allocated, and of self-financing by the companies.	Yearly	ANPE	Response
		Proportion of ISO 14001 certified companies (IND-2 & 5)	This indicator measures the number of industrial companies having succeeded in obtaining the certification of environmental management standards ISO 14001.	Yearly	INNORPI	Response

Table 4.5-13 Monitoring plan (continued)

Affected item	Major potential impact / mitigation or amplification measure	Indicator	Definition	Frequency	Source of data	Nature
Biodiversity conservation	Limitation of use of generic varieties / diversification of varieties of fruits and vegetables	Number of varieties of fruits and vegetables of local origin put on the market	This indicator measures the diversity of varieties of fruits and vegetables put on the market by farmers through the inventory of their number.	Yearly	UTAP / interprofessional groups (GIFruits, GIL)	State
	Limitation of intensive fishing practices / establishment of sustainable fishing practices	Number of artificial reefs operation for sustainable fishery undergone	This indicator measures the number of artificial reefs newly created in the perspective of establishing sustainable fishing practices.	Every 5 years	APAL	Response
Protected area	Limitation of the negative indirect impacts of fish and shrimp farms on Ramsar sites	Number of Integrated multi-trophic aquaculture (ITMA) farms created in the surroundings of Ramsar sites	This indicator measures the number of Integrated multi-trophic aquaculture (ITMA) farms newly established in the surroundings of Ramsar sites.	Every 2 years	MARH, Centre Technique d' Aquaculture	Response
Land tenure issues	Reduction of land speculation and consumption in dates agriculture / improvement of crop densification	Surface of dates production fields changed into multi-production 3-layered oasis	This indicator measures the surface of dates production fields changed into multi-production 3-layered oasis.	Every 5 years	GDA/ CRDA	Response
Landscape	Reduction of the destruction of natural landscapes / improvement of site rehabilitation in the mining sector	Number of sites restored after mining exploitation	This indicator measures the number of mining sites restored to natural environment after the end of the exploitation by the mining company.	Every 2 years	Office National des Mines (ONM)	Response
Local conflicts of interest	Reduction of social conflicts / establishment of participatory planning for mining and industrial sectors	Number of mining and industrial facilities created through a participatory planning process	This indicator measures the number of mining and industrial facilities created through a participatory planning process.	Every 2 years	Ministère de l'Industrie, de l'Energie et des Mines	Response

4.5.6 Results of the SEA and recommendations towards further environmental studies

(1) Situation of the institutionalization of SEA in Tunisia

During the last visit of the experts from the JICA Study Team to Tunisia, in June 2015, ANPE has confirmed the lack of progress in terms of elaboration of the legal and institutional framework for Strategic Environmental Assessment. In addition, there was no implementation of any new experiences of SEA in the country, despite the expectations and the favourable climate to environmental consideration after the adoption of the new Constitution (see Chapter 9.2.1 of the Progress Report, June 2014).

Despite this situation, however, and on the basis of the results of the current SEA, it shall be reaffirmed the importance of pursuing experiments of SEA in the perspective of institutionalizing this tool in Tunisia, and that, in order to organize sectoral developments and spatial planning of the country in a harmonious and sustainable way.

(2) Recommendations regarding subsequent possible SEA

From the experience of the current SEA, which was based on the extremely vast territory of the six governorates of southern Tunisia and which attempted to evaluate with limited means almost all development sectors, it is recommended, for the subsequent phases of development and the Southern Regional spatial planning, and in view of the complexity and overlapping of planned operations, to opt for a multi-sector global programming accompanied by new "Detail SEA" on the areas whose planned development is the most intense.

(a) Identification of candidate areas for subsequent Detail SEA

The evaluation of direct, indirect and cumulative impacts (Chapter 4.5.3) coupled with a simplified analysis of these impacts in space and time allows to identify the areas with most challenging issues which would be likely to benefit from the implementation of a Detail SEA in the future.

The areas having been identified, the "SEA of Gabes gulf and Jeffara plain" and the "SEA of the Chott region and Gafsa" are proposed as shown in Figure 4.5-1 and explained respectively in Table 4.5-14 and Table 4.5-15 below.

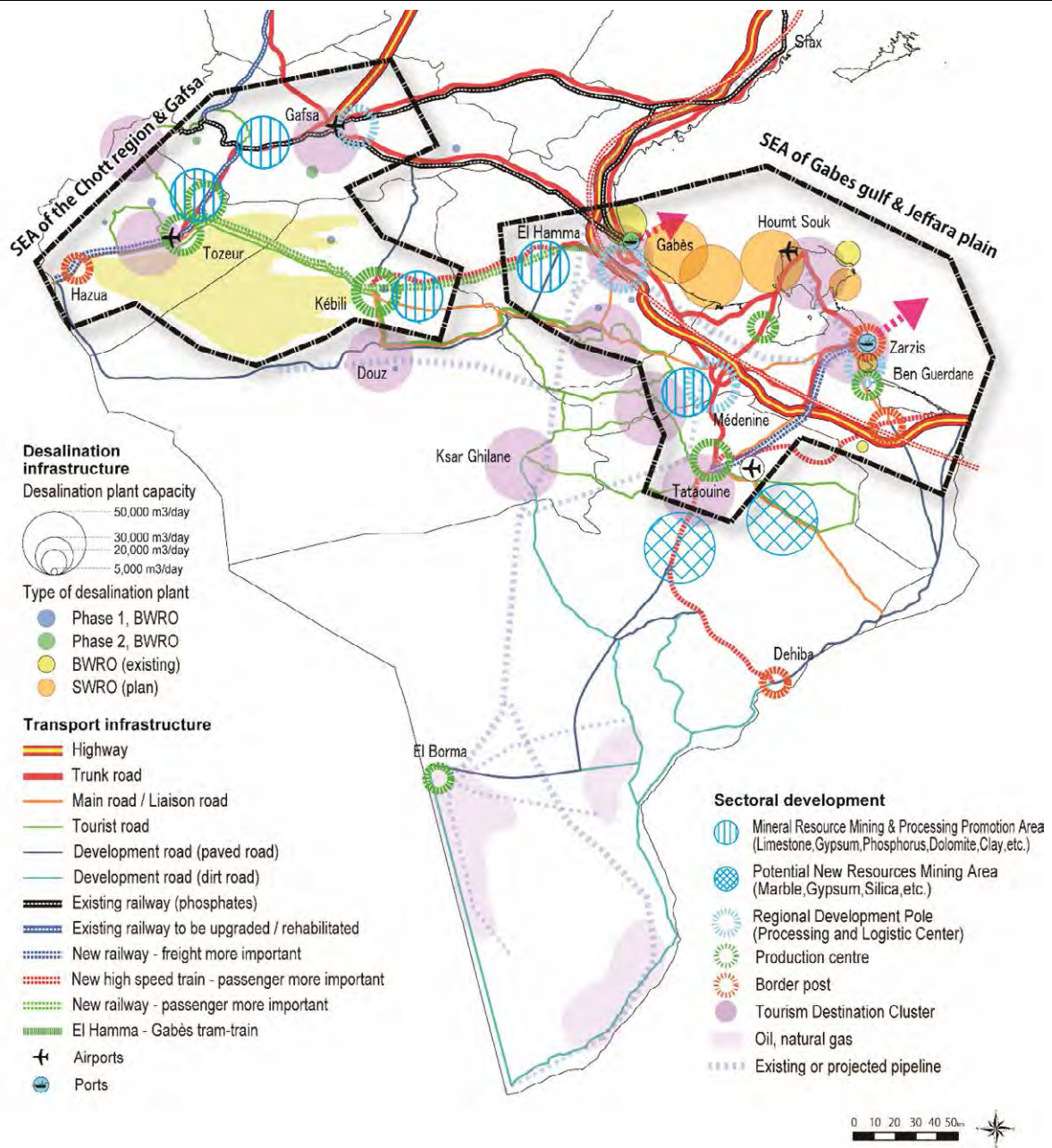


Figure 4.5-1 Map of identification of candidate areas for subsequent Detail SEA

Table 4.5-14 General description of the SEA of Gabes gulf and Jeffara plain

Concerned environmental component	Major developments representing a challenge for the region	Term	Comment
Marin environment of Gabes gulf	- Construction of 4 large capacity desalination plants	Long term	The SEA Gulf of Gabes gulf and Jeffara plain will seek the most harmonious arrangement possible for the numerous operations that are programmed, both on the coastline, which will include the construction of large seawater desalination plants and the expansion of ports, and in the hinterland, which will be crossed by new large-scale transport infrastructure that will need to be integrated without constituting fragmentations. Special attention will be given to particularly vulnerable ecosystems such as that of the gulf of Boughrara and the marine environment in general, already threatened by overfishing and different types of pollution ⁴⁰ . Various technical studies on spatial impacts of developments will help decision-making for identifying of concrete alternatives (spatial modelling of various brine discharges from desalination plants, analysis of cumulative effects on the marine environment, analysis of the sensitivity to desertification etc.).
	- Development of Gabes and Zarzis ports for exportation	Long term	
	- Bridge between Jorf and Ajim (Djerba island)	Mid term	
Land environment of Jeffara plain	- Trans Maghreb high-speed railway	Pending	
	- Highway from Sfax to Libyan border	Short term	
	- New airport in Tataouine	Short term	

Table 4.5-15 General description of the SEA of the Chott region and Gafsa

Concerned environmental component	Major developments representing a challenge for the region	Term	Comment
Chott, oasian areas, mountains of Gafsa	- Railroad crossing the Chott between Kebili and Tozeur	Pending	The SEA of the Chott region and Gafsa will try to organize the emergence of many production poles, the creation of new communication routes and especially railway tracks, while ensuring the maintenance of water balance and integrity of the classified wetland of the Chott el Jerid. The SEA will be an opportunity to address protection measures and management plan of the Ramsar site. Various technical studies on the spatial implications of developments (including geo-hydraulic dynamic) will help decision-making for identifying concrete alternatives. Particular attention will be given to the sustainable management of water resources, especially in a context of scarcity and with the proposed expansion of the phosphate mining that threatens the resources and causes already notorious pollution problems.
	- New developments of phosphate mining	Long term	
	- Assumed expansion of oasis culture surfaces	Mid term	
	- Dates production centres	Short term	

(b) Objectives and implementation frame of subsequent Detail SEA

Regarding the implementation format of the two Detail SEA described above, and in order to reconnect with the early development of Strategic Environmental Assessments implemented in Tunisia, and to continue the experiments in the same way, it seems interesting to choose a format close to the SEA of the East Central region "Enfidha", both in terms of objectives and of implementation framework:

(i) Objectives of subsequent Detail SEA

Indeed, the general objective of the Enfidha SEA initiated in 2008 by the Ministry of Environment and Sustainable Development with the support of the German Cooperation, GIZ, was to make a technical planning of the smooth implementation of a set of development projects⁴¹ already previously defined at

⁴⁰ In our study, the Gulf of Gabes was reported as "Critical industrial pollution pocket" from the diagnostic phase. It was also recommended to accompany, as a short term priority and above all new other development, the depollution of affected areas to ensure the most human development possible. The depollution is the subject of a big dedicated project, the "Project of environmental local governance of the industrial activity of Gabes" launched by the European Union in parallel to our study. With a budget of over 11 million TND for a period of 4 years, the project crystallizes all the expectations in terms of mobilization of actors and technical responses to pollution. The Detail SEA may be able to provide technical answers to questions still pending at that time.

⁴¹ Airport, deep water port, logistics area, AFI industrial area, DIET industrial area, integrated touristic zone of Hergla and tourist zone of Saloum.

a higher level. Thus, it was basically an "operational SEA" whose purpose is to compare various technical solutions and to carefully analyse the cumulative impacts of the different projects. This is also what we can expect from the two Detail SEA described above, based on the planning carried out during our project.

In detail, specific objectives could be:

- To improve project planning based on extensive expertise and a transparent and profitable collaboration within an iterative process;
- To program development projects in harmony with the environmental and sustainable development policies at national and regional level;
- To examine development projects planned in areas designated for a comprehensive and integrated manner with a view to sustainable development;
- To make a comprehensive and integrated assessment of long-term environmental and socio-economic projects programmed in designated areas;
- To highlight cumulative impacts of all the projects and propose mitigation measures and corresponding compensation measures;
- To offer if necessary development alternatives in the designated regions more in tune with regional characteristics and predefined development goals;
- To pursue the institutionalization process of SEA in Tunisia.

(ii) Implementation framework of subsequent Detail SEA

Enfidha SEA had been initiated by the Tunisian State which, through the Ministry of Environment and Sustainable Development, wanted to have a decision-support tool in order to measure the degree of adequacy of development goals for the region with the sensitivity of the natural and human environment. For the two proposed Detail SEA, it seems interesting that, in the same way, Tunisian State through the Ministry of Environment and Sustainable Development support the initiative. Even in a context of decentralization, it seems proper that the arrangement of the big projects are processed and approved by the highest national level, so that the conclusions of the SEA are followed by the concerned public authorities. At the national level, MDICI and MEHAT could provide advisory support, while at the regional level, ODS could animate public consultations with all stakeholders, governments and private sector, involved in the various projects planned.

Regarding the studies, this SEA was realized thanks to the work of a multidisciplinary consultant expert team⁴² for more than two years. This is also what we can plan for the two proposed Detail SEA.

⁴² Environmentalist, regional planner, urban planner hydrologist or hydrogeologist, civil engineer, sociologist etc.

CHAPTER 5 TARGET OF THE DEVELOPMENT OF THE SOUTHERN REGION

5.1 Target indicators

5.1.1 Target indicator for the development goal

“Per capita household consumption” is set as the target indicator to show the achievement of the development goal of “*Economic disparity is reduced between the Southern Regions and advanced regions of Tunisia and among areas of the Southern Region.*” National Institute of Statistics (INS) conducts surveys on the budget, consumption and living standard of the households regularly once in five years. The surveys are well organised and the results of the surveys have been comprehensively analysed. National average, averages of the South-east and the South-west regions of per capita household consumption are available as results of the surveys. Thus, with the results of the surveys, it will be easy to verify the change in the per capita household consumption gaps between the national average and those of the South-east and the South-west. Target values of the indicator for 2025 and 2035 are estimated using the results of increased jobs, which are set as a target indicator of the development vision, and consequent increase of the household income.

5.1.2 Target Indicators for the development Vision

The target indicators of the job creation and sustainable development are set regarding development vision, i.e., “*The Southern Region will be sustainably developed with more employment for everyone creating higher value and keeping strong competitiveness in the world economy — to be sophisticated, unique, and innovative*”. No indicators are set regarding creation of higher value adding because the baseline value, i.e., gross regional domestic product (value added) of the Southern Region cannot be obtained since the figure not estimated by INS or any other official organisation. Indicators for competitiveness are not set as the data to show general competitiveness of the Southern Region have not been found.

(1) Target indicators of job creation

“Numbers of job created per capita of economically active population” are set as the target indicator regarding job creation. Since no one may be interested in some of the created jobs, this indicator has been set instead of “*employments/ unemployment rate*”. In case that all created jobs are taken by some economically active persons, the decrease in unemployment rate will correspond to the number of created job per economical active person. In the explanations below, changes in unemployment rate in the case of the above are mentioned for easier understanding of the readers. As for the numbers of created jobs per capita of economically active population to be attained by the implementation of the strategies and plans proposed in Chapter 3 of this report, the figures or the values for Tunisia, the Southern Region, the South-east and South-west regions in 2025 and 2035 are estimated and compared to check how the regional disparity will be reduced.

(2) For sustainable development

There could be various indicators for sustainable development. Among them, those closely related to the development strategies and plans proposed by the Project would be as follows:

- a) Indicators related to pollution control
- b) Indicators related to environmental conservation
- c) Indicators related to water resources management
- d) Indicators related to renewable energy

As for the above a) and b), norms and standards are well stipulated in Tunisia and the recommendable target indicators in these aspect is just “strictly following all of the existing regulations/norms/standards”. As specific target indicators of sustainable development indicators related to water (groundwater in case of the Southern Region) resources management and renewable energy are proposed as follows:

- 1) Volume of groundwater use within permissible volume or recharged water of the aquifers; and
- 2) Ratio of installed power generation capacity using renewable energy in the Southern Region to the total power generation capacity of Tunisia

Though general conditions of groundwater use are roughly estimated, real situation of the groundwater use in the region is hardly understood due to prevailing unregistered or unrecorded pumping of the groundwater. Monitoring and evaluation (M/E) of the target indicators and feeding the M/E results back to the subsequent implementation and the next planning of will require registration and control system of the groundwater use as discussed in Section 3.4.1 of this report.

As power generation is managed at the national level, the generation capacity only for the region cannot be estimated. Therefore, the target indicators in this aspect are set as ‘ratio of installed power generation capacity using renewable energy (located) in the Southern Region to the total power generation capacity of Tunisia’, referring the national target set by ANME (National Agency for Energy Conservation).

5.2 Current conditions of target indicators

5.2.1 Household consumption

Average per capita consumptions of the South-east, South-west and other regions of Tunisia in 2000, 2005 and 2010 are shown in Table 5.2-1. The data shows the gap between the Southern Region and the Tunisia as well as that between the South-east and South-west regions was substantially narrowed during the period from 2000 to 2005. The gaps, however, have persistently remained afterwards.

Table 5.2-1 Per capita household consumption by region in 2000, 2005 and 2010

(Unit DT./person/year at constant prices of 2005)

	2000	2005	2010
Great Tunis	2,000	2,331	2,624
North East	1,320	1,547	1,718
North West	1,127	1,292	1,311
Centre East	1,707	1,902	2,189
Centre West	968	1,034	1,212

(Unit DT./person/year at constant prices of 2005)

	2000	2005	2010
South East	1,126	1,574	1,787
(Ratio to Tunisia)	(78%)	(93%)	(93%)
South West	1,068	1,338	1,507
(Ratio to Tunisia)	(74%)	(79%)	(79%)
South*	1,104	1,484	1,681
(Ratio to Tunisia)	(77%)	(88%)	(88%)
Tunisia	1,441	1,696	1,919

Note: * Calculated by JICA Expert Team (JET) based on the data of the South-east and South-west regions according to the proportion of the population of the two regions.

Source: Elaborated by JET based on the data of the National Survey on Budget, Consumption and Living Standard of Households in 2000, 2005 and 2010 (L'Enquête Nationale sur le Budget, la Consommation et le Niveau de Vie des Ménages de l'an 2000, 2005 2010) shown in "Measuring poverty inequality and polarisation in Tunisia 2000-2010" ("Mesure de la pauvreté des inégalités et de la polarisation en Tunisie 2000-2010")

It would be difficult to estimate the per capita household consumption of the Southern-east and South-west regions of 2015 as the baseline figure before the implementation of the strategies and plans proposed by the Project, as the data for the estimation, such as employment or income, are not available. The figures of 2010 shown above have to be used as baseline status of the gaps in per capita household consumption between Tunisian average and those of the Southern, South-east and South-west regions.

5.2.2 Employment conditions

The latest data available on employment conditions in the Southern Region and its governorates is given in Table 5.2-2. The number of job created per economically active person is same as employment rate when all jobs created at the moment are taken by some economically active persons. In 2010, all of the governorates in the Southern Region had less number of jobs per economically active persons than that of Tunisia, assuming that all jobs at the time were occupied. Unemployment rate of the Southern Region was 6.5% higher than the average of Tunisia. Unemployment rates of Gafsa and Tataouine Governorate were rather higher, while that of Médenine was comparatively lower and close to the Tunisian average.

Table 5.2-2 Employment conditions in the Southern Regions and its governorate in 2010

	Tunisia	Southern Region	Gabès	Médenine	Tataouine	Gafsa	Tozeur	Kébili
Population	10,570,700	1,564,376	362,788	460,193	147,291	339,300	104,700	150,104
Population aged 15 or more	8,078,900	1,061,707	247,855	309,756	98,732	242,489	75,100	108,298
Economically active population	3,769,238	476,656	112,054	137,488	37,172	106,600	35,936	47,406
Employed population	3,277,395	383,910	91,732	118,377	28,390	76,471	29,834	39,106
Unemployed population	491,843	92,746	20,322	19,111	8,782	30,129	6,102	8,300
Unemployment rate (%)	13.0%	19.5%	18.1%	13.9%	23.6%	28.3%	17.0%	17.5%
Jobs per economic- ally active person*	0.87	0.81	0.82	0.86	0.76	0.72	0.83	0.82

Note: * It is assumed that all jobs created at the time are taken by economically active persons, and the jobs per economically active population equal to the employment rate, i.e.,
(1 - unemployment rate).

Source: Le Sud Tunisien en chiffres 2013

Recent unemployment rates of Tunisia and the Southern Region governorates are shown in Table 5.2-3. Unemployment rates of Gafsa in recent years have been persistently high. The rates of Tozeur have been remarkably improved during the period of 2008–2010, while the rates of Tataouine have been substantially worsened during the same period. The rates of Médenine in the recent years have been comparatively low and always close to the rates of Tunisia. The rates of Kébili have been the second lowest following those of Médenine.

Table 5.2-3 Recent unemployment rates of the Southern Region

year	Tunisia	Southern Region	Gabès	Médenine	Tataouine	Gafsa	Tozeur	Kébili
2007	14.1%	18.5%	21.1%	14.4%	18.6%	20.1%	26.1%	15.1%
2008	14.2%	18.4%	17.8%	13.3%	16.6%	25.8%	29.4%	14.1%
2010	13.0%	19.5%	18.1%	13.9%	23.6%	28.3%	17.0%	17.5%
2011	18.3%	25.6%						
2012	16.7%							
2013	15.3%							

Source: Le Sud Tunisien en chiffres 2009-2013, and the World Bank Data Base

5.2.3 Indicators related to sustainable development

Regarding utilisation of the groundwater resource, the Southern Tunisia has 57 groundwater aquifers, of which 38 are under-exploited, five are in balance, and 14 are overexploited¹. Over-exploitation can be seen over the region except Tataouine and Kébili.

Table 5.2-4 General situation of exploitation of groundwater in Southern Region (2010)

	Groundwater table				Dry res. (g/l)		Resour. Mm3 /y	Expl. Mm3 /y	Avail Rs Mm3 /y	Deficit Mm3 /an	Expl. rate %
	Undr expl.	Bala nced	Over expl.	Total	min	max					
Tataouine	8	3	0	11	1.5	13	15.14	9.36	5.88	0.1	62
Medenine	9	1	4	14	2.5	8.5	12.67	12.97	2.08	2.38	102
Gabes	5	0	2	7	1	12	23.7	25.1	4.8	6.2	106
South East	22	4	6	32	1.67	11.17	51.51	47.43	12.76	8.68	90
Kebili	7	0	0	7	0.5	18.8	5.49	0.26	5.23	0	5
Tozeur	2	0	3	5	1	10	34.08	34.62	3.13	3.67	102
Gafsa	7	1	5	13	0.8	14	33.3	35.84	3.63	6.17	108
South West	16	1	8	25	0.77	14.27	72.87	70.72	11.99	9.84	71.67
TOTAL	38	5	14	57	1.22	12.72	124.38	118.15	24.75	18.52	80.83

Source : DGRE

Total power generation capacity in Tunisia was 4,483 MW in 2013 and is estimated to reach to 5,290 MW in 2015. Capacity of power plants using renewable energy in the Southern Region in 2015 is estimated 64 MW. The capacity is estimated to account for 1.2% of the total capacity of power generation of Tunisia in 2015. This figure is used as the baseline value.

5.3 Target values

5.3.1 Created jobs

(1) Estimated job creation

¹ Groundwater aquifers whose exploitation rate is less than 90% are considered under-exploited aquifers. Those which exploitation rates exceed 110% are considered overexploited, while those between 90 and 110% are considered as aquifers in equilibrium.

The created jobs are estimated as follows:

- a) Jobs created directly by the implementation of proposed strategies, plans and action plans
- b) Induced Jobs created indirectly as a result of jobs created directly (above a))
- c) Increase in jobs not related to the implementation of proposed strategies, plans and action plans

The above three types of created jobs are estimated, added and divided by number of economically active persons. Average figures of jobs created per capita of economically active population of Tunisia, the Southern Region and the governorates are estimated and compared to know how the disparities will be reduced.

(2) Created jobs by implementation of the development strategies, plans and action plans

Table 5.3-1 shows numbers of jobs created by implementation of the development strategies, plans and action plans of the target productive sectors. Jobs created by implementation of renewable energy strategies/plans are calculated based on the targeted power generation set in Section 5.3.3 of this chapter and do not include created jobs by the power export projects as their completion years and generation scales are not yet clearly determined. The jobs created by renewable energy power generation (four jobs per 1MW generation) are specifically distributed among the governorates in a balanced way as all governorates have high potential areas for the renewable power generation. The distribution of jobs created by implementation of handicraft sector strategies/plans by governorate is assumed to be proportional to the distribution of the tourism sector, considering the main markets of the handicrafts.

Table 5.3-1 Number of jobs created by implementation of development strategies, plans and action plans
(Unit: number of jobs)

Target productive sectors		Southern Region	Gabès	Médenine	Tataouine	Gafsa	Tozeur	Kébili
Agriculture, fishery and agro-fishery processing ^{*1}	2015-25	5,960	970	1,220	820	760	890	1,290
	2026-35	8,930	1,450	1,840	1,220	1,150	1,340	1,940
	Total	14,890	2,420	3,060	2,040	1,910	2,230	3,230
Mining, other industry ^{*1}	2015-25	5,840	1,660	1,160	980	1,280	440	320
	2026-35	8,760	2,490	1,740	1,470	1,920	660	480
	Total	14,600	4,150	2,900	2,450	3,200	1,100	800
Renewable energy	2015-25	1,740	1,200	0	160	370		10
	2026-35	3,350	2,320	0	310	710		20
	Total	5,090	3,520	0	470	1,080		30
Tourism ^{*1}	2015-25	5,450	200	4,170	50	610		420
	2026-35	7,160	300	5,240	80	910		630
	Total	12,610	500	9,410	130	1,520		1,050
Handicraft ^{*2}	2015-25	1,980	70	1,520	20	220		150
	2026-35	2,610	110	1,910	30	330		230
	Total	4,600	180	3,430	50	550		380
Total	2015-25	20,970	4,100	8,070	2,030	4,570		2,160
	2026-35	30,810	4,350	10,730	2,800	7,020		3,250
	Total	51,790	10,770	18,800	5,140	11,590		5,410

Note: *1 The numbers of jobs created by implementation of the strategies, plans and action plans in agriculture, fishery and agro-fishery processing sector, mining, other industry sectors and tourism sector are estimated by their respective JET experts. Methods for the estimation are described in respective sections 3 of this report.

*2 The government released data that show the handicraft sector has a potential to create 10,000 jobs in a year. Given that 23% of the artisans are of the Southern Region, 2,300 jobs can be created in a year. However, as the figure is unrealistically large, JET estimated that 4,600 jobs would be created in 20 years, that is one-tenth of the government's estimate.

Source: JET

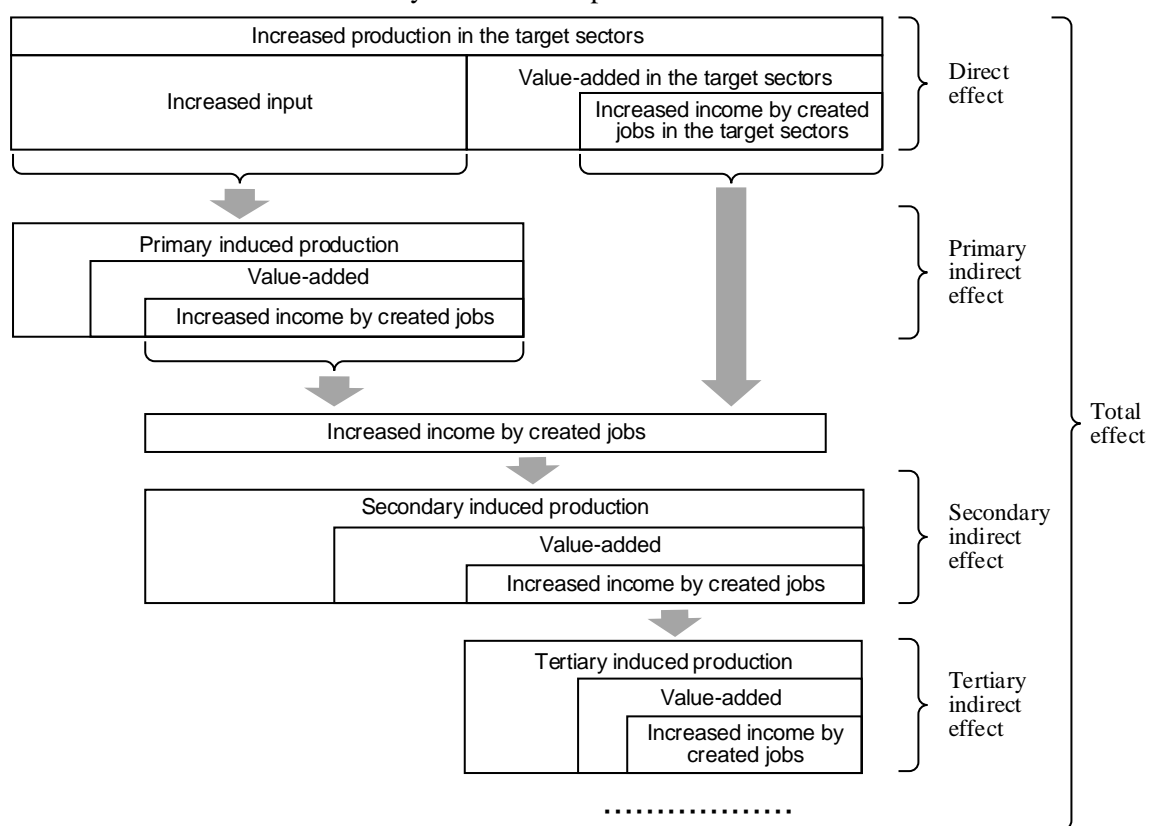
(3) Induced job-creation

Implementation of strategies, plans and action plans will create jobs mentioned above and increase production. The increased production will require input from the productive sectors including the sectors other than the target sectors. To meet the input requirement, additional production will be induced in the target sectors as well as other productive sectors. The induced increase in production will create additional jobs and also will generate income for the people employed as a result of the additional jobs. The increased incomes will further increase the final consumption by the households of the employed people. The increased final consumption will induce further production and job creation.

(a) Methodology

For the estimation of the induced job creation, scales of production caused and induced by the implementation of the development strategies, plans and action plans are analysed and estimated as shown in Source: JET

Figure 5.3-1. As illustrated in the figure, i) direct effect, ii) indirect effects of primary, secondary, tertiary, quaternary, and so on levels are estimated. The economic effects of increased production are estimated referring to input-output table of Tunisia, and the values are converted into number of occupied persons, assuming that the input-output relations among economic sectors in Tunisia and the Southern Region are similar. Though the production or salary remuneration per capita of Tunisia and the Southern Region is different, the numbers of created jobs estimated with the following methodology are correct as the differences are always offset in the process of the estimation.



Source: JET

Figure 5.3-1 Estimation of economic effects of implementation of the development strategies, plans and action plans

Processes for estimation of induced job creation in other service sectors are as follows:

- 1) At first, numbers of jobs created by implementation of strategies, plans and action plans in the target sectors are estimated by respective JICA Experts in charge of the productive sectors. Then, increased production by implementation of strategies, plans and action plans in the target sectors is estimated applying the current productivity (production per occupied person).. Estimated production is just nominal for estimation of induced job creation, using the figures of Tunisia, and do not show the actual level of the value-added or production in the Southern Region.
- 2) The increased production will cause increased salary remuneration, which can be estimated by the input-output table.
- 3) The increased production, as estimated above, will require input from the target and other productive sectors. From the input-output table, the required input (from the target and other productive) for the increased production is estimated. With ratios of imported goods/services to domestic production in the target and other productive sectors, the required domestic input to be supplied by the target and other productive sectors is estimated. With the inverse matrix, the induced production of the target and other productive sectors is estimated.
- 4) Jobs will have to be created for the induced production mentioned above. The number of induced jobs created in the target and other productive sectors are estimated by dividing the induced production by production per occupied person.
- 5) Induced production of the target and other productive sectors will result in induced salary remuneration in the target and other productive sectors, which can also be estimated by the input-output table.
- 6) With the increased salary remuneration (mentioned in number 2 and 5), i.e., income of the workers as a result of the created jobs, will induce final consumption with marginal propensity for final consumption, and subsequently induce further input and production in the target and other productive sectors.
- 7) The induced production in the target and other productive sectors further induce job creation and consequently generate income and final consumption. This cycle will continue repeatedly. The subsequent number of job creation, however, will be substantially smaller and total number of induced jobs will converge to a certain figure.

The above method might have the following limitation/defects:

- a) In case increased demand for input or final consumption exceeds the capacity of a productive sector, the production cannot actually increase. The applied method cannot take this into account.
- b) The method does not take account of variation of stock.
- c) The method assumes stable and constant relation of input-output and relations among productive sectors as well as production volume per occupied person. In case the relations or input coefficient changes, increased production or created jobs may vary.
- d) The method also assumes constant portion of domestic production and import. In case the portion changes the estimates may not be correct.
- e) The intervals between direct, primary and secondary increase in productions are assumed to be

very short or neglected.

- f) The secondary induced productions take into account only those resulted from increased labour income and those by other reasons.
- g) The method does not take account of adjustment of overtime work with which may limit the necessity of additional workers.

(b) Estimation

Production and economically active population of the target and other productive sectors of Tunisia in 2011 are shown in Table 5.3-2. Nearly 40% of the economically active population was engaged in the target sectors in Tunisia, while around 30% of economically active population in the Southern Region in engaged in the target sector.

Table 5.3-2 Production and occupying economically active persons
in Tunisia and the Southern Region (2011)

Productive Sector	Production in Tunisia (DT. million)		Occupied persons (thousand persons)			
			Tunisia		Southern Region	
Target productive sectors	59,000	(51%)	1,186	(38%)	105	(29%)
Other productive sectors	57,061	(49%)	1,954	(62%)	255	(71%)
Total	116,061	(100%)	3,140	(100%)	360	(100%)

Source: Elaborated by JET with data provided by INS (Tableaux des ressources et d'emplois (T.R.E.), 2011, at current prices)

Input-output table of Tunisia in 2011 is simplified to two sector groups, namely the target and other productive sectors as shown in Table 5.3-3.

Table 5.3-3 Simplified input-output table of Tunisia in 2011

Supply				Sector	Demand					
Domestic Production	Import	Others	Total supply		Intermediate consumption	Final consumption	Gross capital formation	Variation of Stock	Export	Total demand
58,219 (59.4%)	29,053 (29.6%)	10,810 (11.0%)	98,082 (100.0%)	Target sectors	38,440 (39.2%)	29,084 (29.7%)	4,755 (4.8%)	1,065 (1.1%)	24,738 (25.2%)	98,082
57,842 (99.6%)	7,061 (12.2%)	-6,838 (-11.8%)	58,065 (100.0%)	Other sectors	16,863 (29.0%)	25,318 (43.6%)	9,260 (15.9%)	62 (0.1%)	6,561 (11.3%)	58,065
110,061 (74.3%)	37,787 (23.1%)	2,299 (2.5%)	156,147 (100.0%)	Total	55,302 (35.4%)	54,402 (34.8%)	14,016 (9.0%)	1,127 (0.7%)	31,299 (20.0%)	156,147

		Output to (Intermediate consumption)						Final Consumption	
		Target sectors		Other sectors		Total			
Input from	Target sectors	29,204	(50.2%)	9,236	(16.0%)	38,440	29,084	(53.5%)	
	Other sectors	5,441	(9.3%)	11,422	(19.7%)	16,863	25,318	(46.5%)	
	Total input	34,645	(59.5%)	20,657	(35.7%)	55,302	54,402	(100.0%)	
Remuneration of salary		9,870	(17.0%)	15,113	(26.1%)	24,983			
Tax, duties and net subsidy		313	(0.5%)	237	(0.4%)	550			
Operating surplus		13,152	(22.6%)	22,074	(38.2%)	35,226			
Value added		23,334	(40.1%)	37,425	(64.7%)	60,759			
Production		58,219	(100.0%)	57,842	(100.0%)	116,061			

Source: Elaborated by JET with data provided by INS (Tableaux des ressources et d'emplois (T.R.E.), 2011, at current prices)

Induced job creation by increased jobs as the direct effect of the implementation of strategies and plans/action plans are estimated as described in Table 5.3-4. Around 1.34 times of the jobs created as direct effects will be induced indirectly. Besides, induced jobs can be estimated at around 3.08 jobs for each job directly created by the implementation of strategies and plans/action plans of tourism sector.

Table 5.3-4 Estimation of induced job creation

No.	Target sectors	Other sectors	Reference
(1)	<i>Occupied persons in Tunisia:</i> 1,186 thousand persons	<i>Occupied persons in Tunisia:</i> 1,954 thousand persons	Table 5.3-2
(2)	<i>Production in Tunisia:</i> DT. 58.2 billion	<i>Production in Tunisia:</i> DT. 57.8 billion	Table 5.3-2
(3)	<i>Production per occupied person:</i> DT. 49.1 thousand/person	<i>Production per occupied person:</i> DT. 29.6 thousand/person	(2)÷(1)
(4)	Created job in the Southern Region: 100 jobs		
(5)	<i>Increased production by created jobs:</i> DT. 4.91 million		(4)×(3)
(6)	<i>Ratio of salary remuneration to the production:</i> 17.0%	<i>Ratio of salary remuneration to the production:</i> 26.1%	
(7)	<i>Increased salary remuneration by increased production of the above (5):</i> DT. 832 thousand		(5)×(6)
(8)	<i>Ratio of input from the target sectors to produce 100% in the target sectors:</i> 50.2%	<i>Ratio of input from the other sectors to produce 100% in the target sectors:</i> 9.3%	Table 5.3-3
(9)	<i>Required input from the target sectors:</i> DT. 2.46 million	<i>Required input from the other sectors:</i> DT. 0.46 million	(5)×(8)
(10)	<i>Ratio of domestic supply in the target sectors:</i> 70.4%	<i>Ratio of domestic supply in the other sectors:</i> 87.8%	Table 5.3-3
(11)	<i>Domestic input supplied from the target sectors:</i> DT. 1.73 million	<i>Domestic input supplied from the other sectors:</i> DT. 0.40 million	(9)×(10)
(12)	<i>Induced production in the target sectors:</i> DT. 2.83 million	<i>Induced production in the other sectors:</i> DT. 0.71 million	Calculated with inverse matrix
(13)	Increased jobs for the induced input to the target sectors: 58 jobs	Increased jobs for the induced input to the other sectors: 24 jobs	(12)÷(3)
(14)	<i>Increased salary remuneration by increased production of the above (12):</i> DT. 480 thousand	<i>Increased salary remuneration by increased production of the above (12):</i> DT. 186 thousand	(12)×(6)
(15)	<i>Total increased salary remuneration by the increased production:</i> DT. 1,499 thousand		(7)+(14)
(16)	<i>Marginal propensity to consume in Tunisia:</i> 83.1%		Banque Centrale de Tunisie
(17)	<i>Induced final consumption:</i> DT. 1,246 thousand		(15)×(16)
(18)	<i>Share of the sector in final consumption:</i> 53.5%	<i>Share of the sector in final consumption:</i> 46.5%	Table 5.3-3
(19)	<i>Induced supply for the induced final consumption of the above (17) in the target sectors:</i> DT. 666 thousand	<i>Induced supply for the induced final consumption of the above (17) in the other sectors:</i> DT. 580 thousand	(17)×(18)
(20)	<i>Induced domestic supply for the induced final consumption of the above (17) in the target sectors:</i> DT. 469 thousand	<i>Induced domestic supply for the induced final consumption of the above (17) in the other sectors:</i> DT. 509 thousand	(19)×(10)
(21)	<i>Induced production to meet the final consumption of the above (17) in the target sectors:</i> DT. 873 thousand	<i>Induced production to meet the final consumption of the above (17) in the other sectors:</i> DT. 686 thousand	Calculated with inverse matrix
(22)	Jobs created by the induced production of	Job created by the induced production of	(21)÷(3)

No.	Target sectors	Other sectors	Reference
	(21): 18 persons	(21): 23 persons	
(23)	Total jobs created by induced production of the above (21): 41 jobs		Total of (22)
(24)	<i>Induced salary remuneration by induced production of the above (21): DT. 148 thousand</i>	<i>Induced salary remuneration by induced production of the above (21): DT. 179 thousand</i>	(21)× (6)
(25)	<i>Total induced salary remuneration by the induced production: DT. 327 thousand</i>		Total of (24)
(26)	Total creation by induced salary remuneration of the above (25): 9 jobs		(23)× (25)÷(15)
(27)	Job creation by induced salary remuneration caused by the induced job creation of the above (26): 2 jobs		(26)× (16)÷(23)
		
(29)	Total effects of job creation: 134 jobs		Total of (13), (23), (26), (27), etc.

Source: Elaborated by JET based on the data in Les comptes de la nation (National Account) 2007-2011 (INS), Le Sud Tunisien en chiffres 2013 (ODS), Rapport annuel 2012 (Banque Centrale de Tunisie), etc.

Numbers of induced jobs, or indirectly created jobs, are shown in Table 5.3-5. The induced jobs will not necessarily take place in the same locations as the directly created jobs by the implementation of the strategies and plans. JET assumes that the induced jobs are distributed in proportion to numbers of economically active persons, of which around 62% will live in the South-east and around 38% in the South-west throughout the planning period. Total numbers of directly and indirectly created jobs are presented in Table 5.3-6.

Table 5.3-5 Number of induced jobs

(Unit: number of jobs)

Target productive sectors		South	South-east	South-west
Agriculture, fishery and agro-fishery processing	2015-25	7,990	4,950	3,040
	2026-35	11,970	7,420	4,550
	Total	19,950	12,370	7,580
Mining and other industries including renewable energy	2015-25	10,160	6,300	3,860
	2026-35	16,230	10,060	6,170
	Total	26,380	16,360	10,020
Tourism	2015-25	16,790	10,410	6,380
	2026-35	22,010	13,650	8,360
	Total	38,800	24,060	14,740
Handicraft	2015-25	2,650	1,640	1,010
	2026-35	3,500	2,170	1,330
	Total	6,160	3,820	2,340
Total	2015-25	37,590	23,310	14,280
	2026-35	53,710	33,300	20,410
	Total	91,290	56,600	34,690

Source: JET

Table 5.3-6 Total numbers of created and induced jobs

(Unit: number of jobs)

Target productive sectors		South	South-east	South-west
Agriculture, fishery and agro-fishery processing	2015-25	13,950	7,960	5,980
	2026-35	20,900	11,930	8,980
	Total	34,840	19,890	14,950
Mining and other industries including renewable energy	2015-25	17,740	11,460	6,280
	2026-35	28,340	18,390	9,960
	Total	46,070	29,850	16,230
Tourism	2015-25	22,240	14,830	7,410
	2026-35	29,170	19,270	9,900
	Total	51,410	34,100	17,310
Handicraft	2015-25	4,630	3,250	1,380
	2026-35	6,110	4,220	1,890
	Total	10,760	7,480	3,270
Total	2015-25	58,560	37,510	21,040
	2026-35	84,520	53,810	30,730
	Total	143,080	91,310	51,770

Source: JET

(4) Increased jobs not caused by the implementation the proposed strategies/plans

Increase in jobs not related to the implementation of proposed strategies, plans and action plans are estimated as follows and shown in Table 5.3-7:

- According to the past trends, when the unemployment of Tunisia has improved, the rate of the Southern Region has also substantially improved.
- Unemployment rate of Tunisia is estimated to decrease 0.2%/year for the period from 2011 to 2030 and 0.3%/year for the period from 2031 to 2040 as shown in Section 1.2.1 of Part 2 of this report.
- Unemployment rate of the Southern Region is estimated to decrease 0.1%/year because of the estimated significant decrease in unemployment rate of Tunisia as mentioned above.
- For the period from 2015 to 2025, 1% of economically active population of 2025, and for the period from 2015 to 2035, 2% of the economically active population of 2035 will be counted as increased jobs in addition to the created and induced jobs by the implementation of the strategies, plans and action plans proposed by the Project.

Table 5.3-7 Job increase unrelated to implementation of the strategies, plans and action plans

(Unit: thousand persons or jobs)

	Tunisia	South	South-east	South-west
Economically active persons	5,011.7	617.6	382.1	235.5
Increased jobs without strategy implementation (2015–25)		6.2	3.8	2.4
Economically active persons	5,443.0	670.5	414.9	255.7
Increased jobs without strategy implementation (2026–35)		7.2	4.5	2.8

Source: JET

(5) Number of jobs per economically active person

Numbers of increased job per economically active person, as well as unemployment rates in cases that all increased jobs are taken by economically active persons, are estimated as shown in Table 5.3-8. The gap in the average employment conditions between Tunisia and the Southern Region would widen until 2025. For the period from 2015 to 2025, the number of increased job for an economically active person of Tunisia will be larger than those of the Southern, South-east and South-west Regions; however, the figure for Tunisia for the period from 2026 to 2035 is substantially smaller than those of the Southern, South-east and South-west Regions. The gap in the unemployment (in case of all jobs are taken) between Tunisia and the Southern Region will be 4.0% in 2015 and will increase to 5.0% by 2025. However, from 2026, the gap is expected to start to narrow drastically, to reduce to as small as 0.3%, and the unemployment will become almost same as the average of Tunisia by 2035. As for the regional disparity within the Southern Region, it is estimated that unemployment rate of the South-east region is 2.6% smaller than that of the South-west regions in 2015. The gap will slightly increase to 2.8% by 2025 and to continue to increase to 3.6% by 2035. It would be necessary for the public administration to encourage for job increase in the South-west region as much as much as possible.

It should be noted the achievement of created job per economically active person and unemployment rate (in case of all jobs are taken) will depend not only on the number of jobs created but also on number of economically active persons. Number of economically active persons should also has to be carefully monitored when the attainment of the target indicator is measured.

Table 5.3-8 Numbers of increased jobs per economically active person of Tunisia and the Southern Region in 2025 and 2035

		Tunisia	South	South-east	South-west
2015	Economically active persons (2015) (thousand)	4,299.1	551.7	340.7	210.9
	Number of existing jobs (2015) (thousand)	3,658.5	447.6	279.9	167.7
	Unemployment rate (2015) (%)	14.9%	18.9%	17.9%	20.5%
	<i>Number of jobs per economically active person (2015)</i>	<i>0.851</i>	<i>0.811</i>	<i>0.821</i>	<i>0.795</i>
2015-2025	Economically active persons (thousand) (2025)	5,011.7	617.6	382.1	235.5
	Increased jobs (2015–25) (thousand)	706.7	59.2	37.9	21.3
	Number of increased jobs per economically active person (2015–25)	0.141	0.096	0.099	0.090
	Unemployment rate (2025) (%)	12.9%	17.9%	16.8%	19.7%
2035	Economically active persons (2035) (thousand)	5,443.0	670.5	414.9	255.7
	Increased jobs (2026–35) (thousand)	511.7	91.8	58.3	33.5
	Number of increased jobs per economically active person (2026–35)	0.094	0.137	0.140	0.131
	Unemployment rate (2035) (%)	10.4%	10.7%	9.4%	13.0%

Source: JET

5.3.2 Per capita household consumption

Per capita household consumption in 2025 and 2035 of the South-east, South-west and Southern regions as well as Tunisia is estimated as shown in Table 5.3-10. The estimate is done with the following

assumptions:

- a) All created jobs are assumed to be taken by economically active persons.
- b) For estimation of the per capita household consumption, i) at first, increased household income is estimated with increased number of occupied economically active persons and increased salary, and ii) increased house consumption is estimated applying marginal propensity to consume of 0.831.
- c) Average salary of an employer or employee in 2011 is estimated at DT. 7,957/year, at current prices of 2011 according the input-output table of Tunisia in 2011. The salary is estimated to be raised with raised consumer price and growth in GDP per capita. Though salary level of Tunisia and the Southern Region may be different, the same amount is applied as i) contribution of an occupied economically active person to household consumption of the Southern Region is higher than that of Tunisia, and ii) there are not data found about regional or local differences of the salary in Tunisia.
- d) The changes in consumer price index and growth in GDP per capita shown in Table 5.3-9 are applied in the estimation.

Table 5.3-9 Changes in consumer price index and growth in GDP per capita

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Consumer price index (2005=100)	100	104	108	113	117	123	127	133	141	148	155
Growth in GDP per capita (%)						2.2%	-1.7%	3.7%	1.5%	2.8%	3.2%

Source: JET

As shown below, the gap in per capita household consumption for a year between the Southern Region and Tunisia will widen from 2015–25, while the gap between the South-east and South-west Regions is expected narrow gradually during the target period. As can be seen below, after 2026, the household consumption per capita in the Southern Region, especially that of South-west Regions, will grow more faster than the Tunisian average.

Table 5.3-10 Per capita household consumption for a year in 2025 and 2035

year	2000	2005	2010	2015*	2025	2035
Occupied economically active population (thousand persons)						
- South-east	218	229	238	280	318	376
- South-west	133	136	145	168	189	222
South	351	365	384	448	507	599
Tunisia	2,574	2,930	3,277	3,659	4,365	4,877
Increase in occupied economically active population (thousand persons)/year						
- South-east		11	10	41	38	58
- South-west		3	10	22	21	33
South		13	19	64	59	92
Tunisia		356	348	381	707	512
Increase in household income (DT. million, at 2015 price)/year						
- South-east				684	1,935	3,906
- South-west				386	1,138	2,296
South				1,069	3,073	6,202

Tunisia				7,370	28,603	46,843
Increase in household consumption (DT. Million, at 2015 price)/year						
- South-east				568	1,608	3,246
- South-west				320	945	1,908
South				889	2,554	5,154
Tunisia				6,125	23,769	38,927
Total household consumption (DT. million) at 2015 prices/year						
- South-east	1,542	2,261	2,683	3,251	4,859	8,105
- South-west	910	1,178	1,371	1,691	2,636	4,544
South	2,452	3,439	4,053	4,942	7,496	12,649
Tunisia	21,095	26,323	31,353	37,478	61,247	100,174
Population (thousand persons)						
- South-east	884	927	969	3,251	4,859	8,105
- South-west	550	568	587	1,691	2,636	4,544
South	1,433	1,495	1,555	4,942	7,496	12,649
Tunisia	9,444	10,013	10,541	11,147	12,149	12,777
Per capita household consumption Tunisian Dinar (DT.)/year at 2015 prices						
- South-east	1,745	2,440	2,770	3,213	4,488	7,143
Ration to Tunisia	78.1%	92.8%	93.1%	95.6%	89.0%	91.1%
- South-west	1,655	2,074	2,336	2,790	4,118	6,812
Ration to Tunisia	74.1%	78.9%	78.5%	83.0%	81.7%	86.9%
South	1,711	2,301	2,606	3,055	4,350	7,021
Ration to Tunisia	76.6%	87.5%	87.6%	90.9%	86.3%	89.5%
Tunisia	2,234	2,629	2,974	3,362	5,041	7,840
Growth in per capita household consumption						
year	2010	2025		2035		
	Value	Value	Ratio (2025/2010)	Value	Ratio (2035/2025)	
- South-east	2,770	4,488	1.62	7,143	1.59	
- South-west	2,336	4,118	1.76	6,812	1.65	
South	2,606	4,350	1.67	7,021	1.61	
Tunisia	2,974	5,041	1.69	7,840	1.56	

Note: Preliminary estimated by JICA Expert Team for estimation of the values in 2025 and 2035 with limited available data.
Source: JET

5.3.3 Indicators of sustainable development

(1) Volume of groundwater use

As water resources are scarce in the Southern Region and water use is inevitable for development of the region, sustainable use of water resources is essential for sustainable development of the region. There are two types of aquifers in the region: deep (fossil water) aquifers and shallow (rechargeable) aquifers. Targets are set separately for shallow groundwater (aquifers) and deep ground water (aquifers). By the implementation of the development strategies, plans and action plans of productive sectors (sector of agriculture, fishery, livestock breeding and food processing, among others), infrastructure development sector (especially that of water supply and wastewater treatment) and cross-cutting issues (water

resources management), the following target will be attained.

(a) Deep aquifers (Fossil water)

As fossil water is not rechargeable once it is dried up, like petroleum oil, it cannot be used any more. Then, strictly speaking, there is no sustainable use of fossil water. SONEDE under Ministry of Agriculture, Water Resources and Fishery has a policy of not to increase fossil water use after 2030. Current fossil water use in the Southern Region is estimated at around 800 m³, though it is difficult to know the exact figure. It is recommended to follow the target set by the ministry as well as to develop information system on water resources potential and use, and to reinforce abstraction control for the effective regulation of groundwater use, as proposed in Section 3.4.1 of Part 2 of this report.

- ✓ Use of fossil water will not increase after 2030.

Even before 2030, it would be better not to allow using fossil water without any limit, as it is necessary to shift to other water sources smoothly.

(b) Shallow aquifers (Rechargeable groundwater)

The target can be simply set as follows:

- ✓ Use of shallow groundwater should remain under the rechargeable volume.

The following should be implemented before setting adequate target values to respective shallow aquifers as recommend in Section 3.4.2 of Chapter 3 of this report:

- Installing or designating monitoring wells to estimate rechargeable volume
- Conducting pumping tests or monitoring the water use of the aquifers, and monitor water level

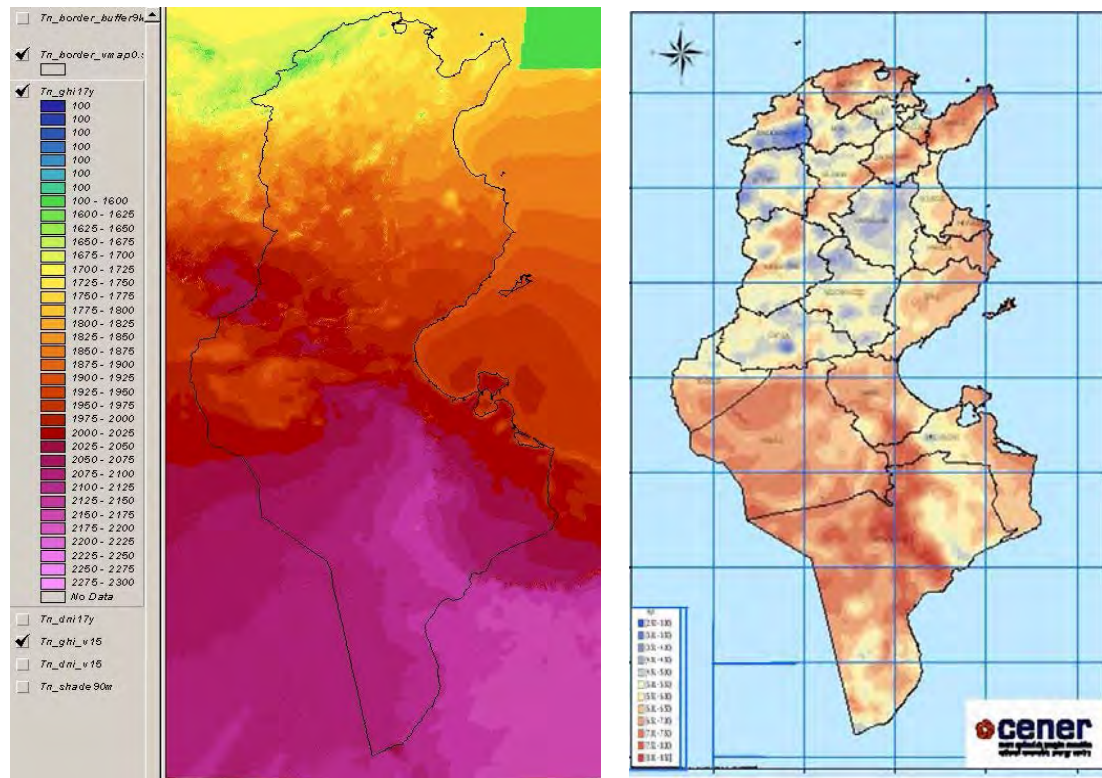
(2) Ratio of installed capacity of power generation using renewable energy in the Southern Region to installed total capacity of power generation in Tunisia

STEG and ANME (National Agency of Energy for Energy Conservation) have set the national targets of renewable energy power generation as shown in Table 5.3-11. Considering the national targets, potential of renewable energy as well as transmission network capacity, JET proposed targets for the Southern Region described in the table. As renewable energy, such as solar radiation or wind velocity, is abundant over the region, the power station can be located in areas with scarce employment opportunities.

Table 5.3-11 Target for installed capacity of power generation with renewable energy

	Total installed capacity for Tunisia (A)	National target of installed renewable energy power generation capacity	Target for the Southern Region (B)	(B) / (A)
2015	5,290	218	63.9	1.2%
2025	8,170	1000	499.2	6.1%
2035	11,130	4,700	1,335.6	12%

Source: JET



Source: STEG

Figure 5.3-2 Potentials of solar energy and renewable energy in Tunisia

CHAPTER 6 RECOMMENDATIONS

During the public consultation (P/C) meetings, JICA Expert Team (JET) has been told by the participants that “Donors have formulated many plans, but none them has been implemented or realised. We need implementation.”

JET has tried to formulate realistic strategies, plans and action plans. However, before the implementation, the followings have to be done:

- 1) Following required decision-making procedure
- 2) Securing/allocating requited budgets

To carry out above 1), it is necessary to incorporate the short-term (5-years) plans and action plans proposed in this report into the next five-years economic and social development plan as suggested in the steering committee meetings. Since the national development plan is composed of i) global plan, ii) sector plans, and iii) regional plans, short term plans and action plans have to be included in the related sector plans and the Southern Region plan. It is requested for MDICI and ODS to explain to related ministries and state agencies as well as governors and regional council members contents and rationale of the short-term plans and action plans proposed by the Project. For this purpose, JET has prepared a brochure and the attachment for the quick reference by decision-makers. It is recommended to use them.

To execute the above 2), monitoring and evaluation (M/E) have to be regularly carried out for coordinated and synchronised implementation, a key element for integrated regional development. Results of the M/E have to be fed-back for the budget allocation of the next year, as recommended in Strategy RP-1 for regional development in general, and in Strategy RP-4 for cluster development specifically (see Section 3.1.3 of this report). Appropriate budget allocation is essential for any public administration activities.

As Scenario 3 is selected, (refer to Section 2.1.3 and 2.1.4 of this report), the role of public administration organisations will be crucially important and the capacity of the public administration will determine the level to which the regional development is achieved. As the regional development involves various sectors, coordination among and capacity development of all related public administration organisations will be keenly necessary. Capacity development of all relevant organisations will take a long time and incur large costs. JET proposes the immediate establishment of a coordination mechanism for the united implementation by both the public and private sectors according the strategies proposed in Section 3.1.3 of this report.

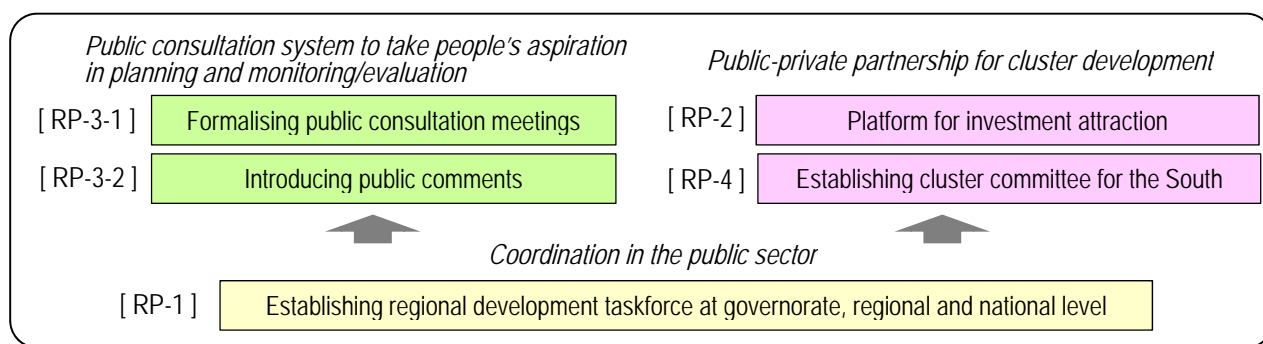


Figure 6.1-1 Proposed coordination mechanism for the regional development

For the establishment of the above-mentioned coordination mechanism, MDICI and ODS have to start implementation of “RP-1: Establishing a coordination mechanism in the planning, implementation and monitoring/evaluation of regional development” (more concretely, “Establishing a regional development task force at the governorate, regional, and national levels”). For a start, it would be better to officialise/legalise the coordination mechanism based on draft proposals prepared by the Project.

The functions/duties of MDICI and ODS for the coordination for regional development planning, implementation, monitoring, and evaluation should be clearly defined. For the coordination, MDICI/ODS have to discharge the following duties. The main roles of MDICI are coordination at the national level and supervision of the administration by ODS, while the main roles of ODS are coordination at the local, governorate, and regional levels and the administration of regional development planning, implementation, monitoring, and evaluation for the Southern Region.

- i) Preparing definitions of coordination mechanisms, such as the functions and membership of the regional development task forces, public consultation, and the procedure of the public comments
- ii) Discussing the definitions with the Ministry of Interior (MI), Ministry of Finance (MF) and other related ministries and requesting the relevant authorities to approve of the definitions
- iii) Organising the regional development task forces, the public consultation members
- iv) Managing the regional development planning/implementation/monitoring/evaluation, the public consultation meetings, and the public comments

It is important for the task forces and public consultation meetings to have definite roles and functions in the coordination for regional development. The “regional development committees” are actually playing certain roles in the regional development planning for the national economic and social development plan. However, coordination mechanisms in monitoring, evaluating, and feeding back their results to subsequent implementation and planning has to be established rigidly. It will be necessary to reinforce the functions of the task forces and the public consultation meetings in this regard. For the effective administration of the whole coordination mechanisms, the responsibilities and powers of MDICI/ODS have to be strengthened. MDICI/ODS have to request the relevant authority and obtain the required power and budget.

For the cluster development, the roles of MDICI/ODS are monitoring/evaluation and support to the cluster committees as a part of their duties for the administration of the regional development task forces.

In order to establish and manage the coordination mechanisms effectively, the capacity development of MDICI/ODS is critically important. As on-the-job training (OJT) would be the most effective approach for capacity development, MDICI/ODS can be advised to apply a technical cooperation project on an important element of the regional development with overall advisory services for administration of the whole coordination to an international development partner. As investment attraction is a critical factor for the successful regional development of the South and this job is included in the duties of MDICI/ODS, a technical cooperation project for this aspect can be proposed as recommended in RP-2.

