

Ministry of Regional Development, Building, Housing and Public Works (MAHTP)  
Government of the Republic of Madagascar

# **The Project on Master Plan Formulation for Economic Axis of TaToM (Antananarivo-Toamasina, Madagasikara)**



## **Final Report Main Text: Volume 1**

October 2019

Japan International Cooperation Agency (JICA)

Oriental Consultants Global Co., Ltd.  
CTI Engineering International Co., Ltd.  
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## **Final Report**

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## List of Abbreviations

ABBREVIATION	ENGLISH	FRENCH
3P	Public-Private Partnership	-
3R	Reduce, Re-use, Recycle	-
AAAC	All Aluminium Alloy Conductor	-
ACSR	Aluminium Conductor Steel-Reinforced	-
ADEMA	Airport of Madagascar	Aéroport de Madagascar
ADER	Rural Electrification Development Agency	Agencede Developpement de l'Electrification Rurale
ADP	Airport of Paris	Aéroport de Paris
AfCFTA	-	The African Continental Free Trade Area
AFD	French Development Agency	Agence Francaise de Developpement
AfDB	African Development Bank	Banque Africaine de Developpement
AGOA	African Growth and Opportunity Act,	La loi sur la croissance et les opportunités économiques en Afrique
APIPA	Authority for the flood protection of the plain of Antananarivo	Autorité pour la Protection contre les Inondations de la Plaine d'Antananarivo
ARR	Arrondissement	Arrondissement
ARTEC	Authority of Communication Technology Regulatory	Autorite de Regulation des Technologies de Communication
ATT	Agency of Land Transport	Agence des Transports Terrestres
BCC	Bureau Control Command	Bureau de Controle et de Commande
BF	Public Water Connection	Borne Fontaine
BFPS	Public and Social Water Connection	Borne Fontaine Publique et Sociale
BL	Laundry Facility	Bassin Lavoir
BNGRC	Bureau of Disaster Risk Management	Bureau National de Gestion des Risques et des Catastrophes
BP	Private Connection	Branchement Particulier
BPOR	Regional Objective Budget Program	Budget Programme par Objectif par Région
BRGRC	Regional office of BNGRC	Bureau Régional du BNGRC
CCA	Climate Change Adaptation	-
CCGRC	Risk and Disaster Management Commune Committee	Comité Communal de Gestion des Risques et Catastrophes
CEG	General Secondary School	College d'Enseignement General
CHRD	District Reference Hospital Centre	Centre Hospitalier de Reference de District
CHRR	Regional Reference Hospital Centre	Centre Hospitalier de Reference Regional
CHU	University Hospital Centre	Centre Hospitalier Universitaire
CIRAD	Agricultural Research Centre for International Development	Centre de Coopération Internationale en Recherche Agronomique pour le

ABBREVIATION	ENGLISH	FRENCH
CISCO	School District	Circonscription Scolaire
CLGRC	Risk an Disaster Management Local Committee	Comité Local de Gestion des Risques et Catastrophes
CNTEMAD	National Distance Learning Centre of Madagascar	Centre National de Tele-Enseignement de Madagascar
COMESA	Common Market for Eastern and Southern Africa	Marche Commun pour l’Afrique de l’Est et Austral
CPGU	Emergency Prevention and Management Unit	Cellule de Prévention et de Gestion des Urgences
CREAM	Research, Study and Support Center for Economic Analysis of Madagascar	Centre de Recherches d’Etudes et d’Appui à L’Analyse Economique de Madagascar
CROU	Emergency Operation Regional Unit	Cellule Régionale des Opérations d'Urgence
CSB	Basic Health Centre	Centre de Sante de Base
CTMM	Monetics Processing Service of Madagascar	-
CUA	Urban Commune of Antananarivo	Commune Urbaine d'Antananarivo
CUT	Urban Commune of Toamasina	Commune Urbaine de Toamasina
DGATE	Direction of Territorial Planning and Equipment	Direction Générale de l'Amenagement du Territoire et de l'Equipement
DGEAH	General Directorate of Water Management, Sanitation and Hygiene	Direction Générale de la Gestion de l'Eau, de l'Assainissement et de l'Hygiène
DGEHU	General Directorate of Hospitals and Universities	Direction Generale des Hopitaux Universitaires
DGM	General Directorate of Meteorology	Direction Générale de la Météorologie
DGRE	Directorate of Water Resources Management	Direction Générale de la Gestion de Ressources en Eau
DHS	Demographic and Health Survey	-
DPS	Directorate of Strategic Planning	Direction de la Planification Stratégique
DREN	Regional Directorate of Education	Direction Regionale de l'Education
DRM	Disaster and Risk Management	-
DRR	Disaster Risk Reduction	-
DTM data	Digital Terrain Model	-
DTOA	Technical Directorate of Water in Antananarivo	Direction Technique de l'Eau à Antananarivo
EDBM	Economic Development Board of Madagascar	-
EDSMD	Demographic and Health Survey of Madagascar	Enquête Démographique et de Santé de Madagascar

ABBREVIATION	ENGLISH	FRENCH
EIB	European Investment Bank	-
ENELEC	Electric Energy	Energie Electrique
ENI	National School of Information	Ecole Nationale d'Informatique
EPP	Public Primary School	Ecole Primaire Publique
EPZ	Export Processing Zones	-
ESPA	Polytechnic University of Antananarivo	Ecole Supérieur Polytechnique d'Antananarivo
ESTI	ICT College	Ecole Supérieure des Technologies de l'information
EU	European Union	-
FAO	Food and Agriculture Organization	-
FKT	Fokontany	Fokontany
FPMH	Drilling using human-operated pump	Forage a pompe a motricite humaine
FTA	Free Trade Area	-
FZE	Free Zone Enterprises	-
GDP	Gross Domestic Product	-
GIS	Geographic Information System	-
GIZ	German Development Cooperation	-
GOTICOM	ICT Operators Group	Groupement des Opérateurs des Technologies de l'Information et de la Communication
GRDP	Gross Regional Domestic Products	-
GRIMA (projet)	Inundation and landslide risk management in Antananarivo	Gestion des Risques d'Inondation et de Mouvement de terrain à Antananarivo
GSM	Global System for Mobile communications	-
HV	High Voltage	-
IAC	Information Access Center	-
ICT	Information and Communication Technology	-
IEC	Information, Education and Communication	-
IMF	International Monetary Fund	-
INSTAT	National Institute for Statistics	Institut National de la Statistique
IOGA	Institute and Observatory of Geophysics of Antananarivo	Institut d'Observation Geophysique d'Antananarivo
IORA	Indian Ocean Rim Association	-
ITU	International Telecommunication Union	-

ABBREVIATION	ENGLISH	FRENCH
JICA	Japan International Cooperation Agency	-
LCPDP	Least Cost Power Development Plan	-
LDI	Act on Industrial Developpement	Loi sur le Développement Industriel
LION	Lower Indian Ocean Network	-
LSC	Local Steering Committee	-
LV	Low Voltage	-
M2PATE	Ministry attached to the Presidency in charge of Presidential Projects, Planning and Equipment	Ministère auprès de la Présidence en charge des Projets Présidentiels, de l'Amenagement du Territoire et de l'Equipement
MEEH	Ministry of Water, Energy and Hydrocarbons	Ministère de l'Eau, de l'Energie et des Hydrocarbures
MEN	Ministry of National Education	Ministère de l'Education Nationale
METFP	Ministry of Employment, Technical Education and Vocational Training	Ministère de l'Enseignement Technique et de la Formation Professionnelle
MID	Ministry of the Interior and Decentral	Ministère de l'Intérieur et de la Décentralisation
MINESUP	Ministry of Higher Education and Research	Ministère de l'Enseignement Supérieure et de des Recherches Scientifiques
MPTDN	Ministry of Posts, Telecommunication and Digital Development	Ministère des Postes, des Télécommunications et du Développement Numérique
MSP	Ministry of Public Health	Ministère de la Sante Publique
MTM	Ministry of Transports and Meteorology	Le Ministère des Transports et de la Météorologie
MV	Medium Voltage	-
MW	Mega Watt	-
NEPAD	New Partnership for Africa's Development	Nouveau partenariat pour le développement de l'Afrique
NGO	Non-Governmental Organization	-
NHP	National Housing Policy	
NPE	New Energy Policy	Nouvelle Politique de l'Energie
NR	National Road	-
NRI	Network Readiness Index	-
NRW	Non-Revenue Water	
NSC	National Steering Committee	-
NSPS	National Sanitation Policy and Strategy	-
ODA	Official Development Assistance	

ABBREVIATION	ENGLISH	FRENCH
OPEC	Organization of the Petroleum Exporting Countries	Organisation des Pays Exportateurs de Petrole
ORE	Electricity Regulatory Office	Office de Regulation de l'Electricite
PAGOSE	Electricity Sector Governance and Operational Improvement Project	Projet d'Amelioration de la Gouvernance et des Operations dans le Secteur de l'Electricite
PCD	Communal Development Plan	Plan Communal de Développement
PDDE	Economic Development Master Plan	Plan Directeur de Developpement Economique
PDSS	Health Sector Development Plan	Plan de Developpement du Secteur Sante
PF	Family Planning	Planning Familial
PGE	General Policy of the State	Politique Générale de l'Etat
PIAA	Integrated Sanitation Program of Antananarivo	Programme Intégré d'Assainissement d'Antananarivo
PLOF	Local Plan of Forest Occupation	Plan Local d'Occupation Forestière
PNAEPA	National Program of Access to Drinking Water and Sanitation	Programme National d'Accès à l'Eau Potable et à l'Assainissement
PND	National Development Plan	Plan National de Developpement
PPMH	Wells with Human-operated Pump	Puit avec Pompe à Motricité Humaine
PPP	Public Private Partnership	-
PRD	Plan Régional de Développement	Regional Development Plan
PRODUIR	Integrated urban development and resilience project	PROjet de Développement Urbain Intégré et de Résilience
Project TaToM	The Project on Master Plan Formulation for Economic Axis of TaToM (Antananarivo-Toamasina, Madagasikara)	-
PRSP	Regional Directorate of Public Health	Direction Regionale de la Sante Publique
PSAEP	Agricultural, Livestock and Fisheries Sector Program	Programme Sectoriel Agricole, Elevage et Pêche
PSE	Education Sector Plan	Plan Sectoriel de l'Education
PUDé	Detailed Urban Plan	Plan d'Urbanisme Détaillé
PUDi	Urban Master Plan	Plan d'Urbanisme Directeur
PUPIRV	Infrastructure Preservation and Vulnerability Reduction Emergency Project	Projet d'Urgence pour la Préservation des Infrastructures et la Réduction de la Vulnérabilité
PVC	PolyVinyl Chloride	-
RC	Reinforced Concrete	-
RECs	Regional Economic Communities	Communautes Economiques Regionales
RI	Regional Interconnection	-

ABBREVIATION	ENGLISH	FRENCH
RIA	Interconnected Network of Antananarivo	Reseau Interconnecte d'Antananarivo
RIT	Regional Interconnection system	Système d'Interconnection Regionale
ROM	Revenue from Household Waste	Redevance sur les Ordures Menageres
ROW	Right of Way	
SADC	Southern African Development Community	Communauté de Développement de l'Afrique Australe
SAIC	Intercommunal Land Use Plan	Schema d'Amenagement Inter Communal
SAMVA	Autonomous Department for Maintenance of Antananarivo	Service Autonome de Maintenance de la Ville d' Antananarivo
SASM	Madagascar Sugar Farming Society	Société Agricole Sucrière de Madagascar
SDAU	Urban sanitation master plan	Schéma Directeur d'Assainissement Urbain
SEA	Strategic Environmental Assessment	-
SEZ	Special Economic Zone	-
SIM	Union of Industries of Madagascar	Syndicat des Industries de Madagascar
SMS	Short Message Service	-
SNGRC	National Strategy for Disaster Risk Management	Stratégie Nationale de Gestion des Risques et des Catastrophes
SPAT	Toamasina Autonomous Port Authority	Société du Port à gestion Autonome de Toamasina
SWM	Solid Waste Management	-
TELMA	Telecom Malagasy	-
TVTE	Technical and Vocational Education and Training	-
TWG	Technical Working Group	-
USD	United State Dollar	-
WB	World Bank	-
WHO	World Health Organization	-
WSUP	Water and Sanitation for the Urban Poor	-
WTP	Water Treatment Plants	-
WUA	Water Users Associations	-
ZAP	Educational Administrative Area	Zone Administrative Pédagogique

ABBREVIATION	ENGLISH	MALAGASY
JIRAMA	Malagasy Water and Electricity	Jiro sy Rano Malagasy
FIVMPAMA	Group of Malagasy Employer	Fivondronan'ny mpandraharaha malagasy
SIRAMA	Sugar Industry of Madagascar	Siramamy Malagasy

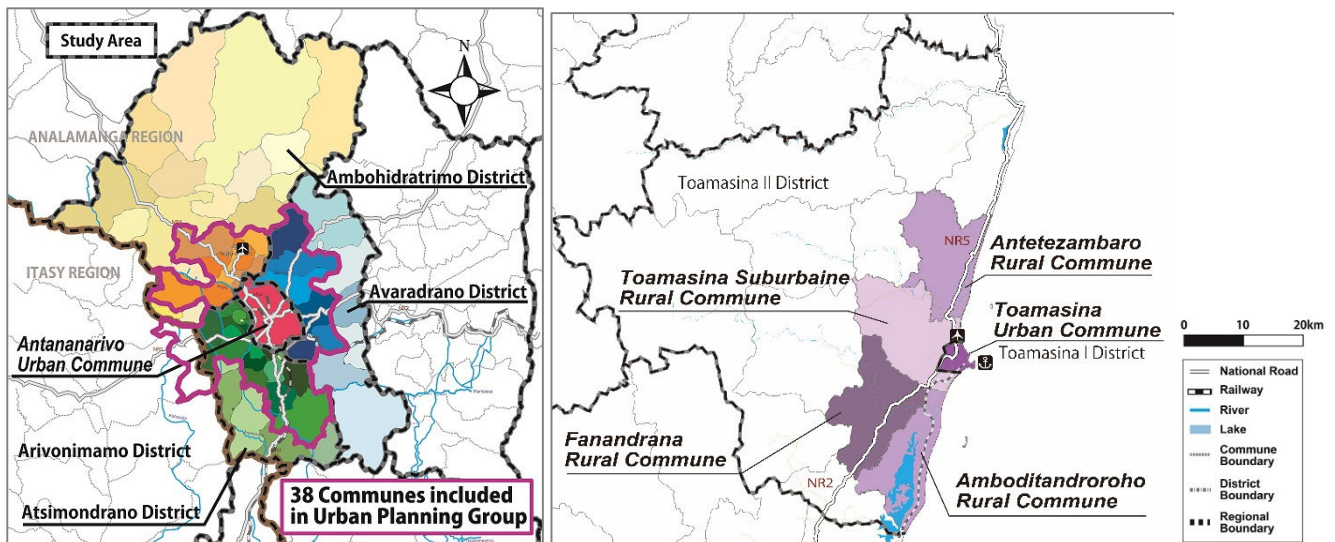
## Executive Summary

### The Project on Master Plan Formulation for Economic Axis of TaToM (Antananarivo-Toamasina, Madagasikara)

#### Overall TaToM Area

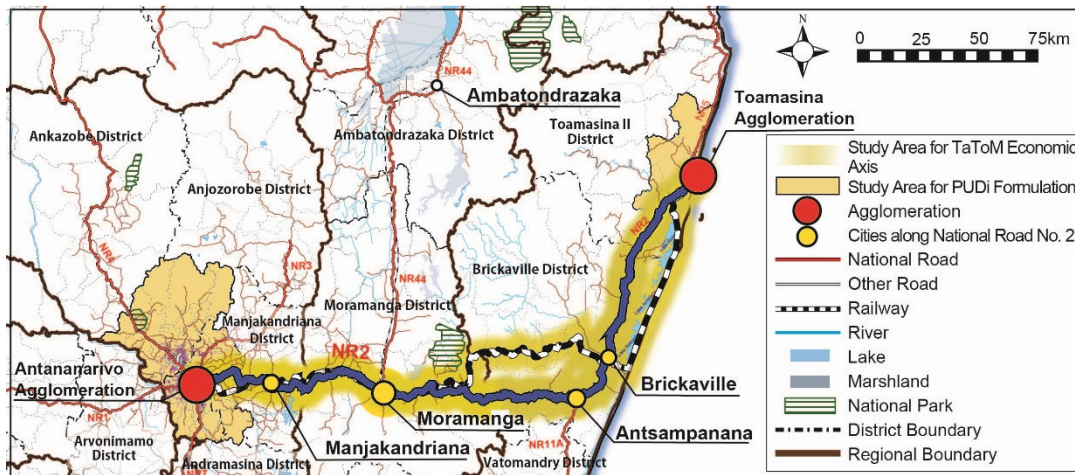
**Target Area for the Master Plan:** TaToM Area covering Antananarivo Agglomeration (Antananarivo Urban Commune (CUA: *Commune Urbaine d'Antananarivo*) and its surrounding 37 communes), Toamasina Agglomeration (Toamasina Urban Commune (CUT: *Commune Urbaine de Toamasina*) and its surrounding four communes) and TaToM Economic Axis (connecting the two agglomerations).

The whole area of TaToM (the Overall TaToM Area) is composed of three areas, namely, Antananarivo Agglomeration, Toamasina Agglomeration and the TaToM Economic Axis.



Source: JICA Study Team

Figure 1 Study Area for Antananarivo Agglomeration and Toamasina Agglomeration



Source: JICA Study Team

Figure 2 Study Area for Antananarivo - Toamasina Economic Axis



**Future Vision for Overall TaToM Area:** Through the development of the Overall TaToM Area, Madagascar's economy will be reconstructed and the stability of Madagascar's society will be regained. The Overall TaToM Area will sustainably develop its own economic sectors. Furthermore, it could support the development of economies of other regions by enhancing the connectivity to other regions from Antananarivo and the connectivity to other regions from Toamasina Port through the upgrading of the transport function of the TaToM Economic Axis.

**Target Years of the Master Plan:** Year 2023 for the Short Term, Year 2028 for the Mid Term and Year 2033 for the Long Term

**Present Situation and Issues of Madagascar and Overall TaToM Area:**

- In Madagascar, an abundant, relatively low-wage labour force exists. The wage level of Madagascar belongs to the group of 25 countries with the lowest minimum wages. The labour force is also hard working and good with hands. This labour force is concentrated especially in Antananarivo Agglomeration, the capital of Madagascar.
- An export-oriented textile industry is prominent in Madagascar. It has been incorporated in the global value chain. Madagascar is also one of the world-famous destinations of nature tourism because of rare animals and plants.
- On the other hand, the condition of economic infrastructure, such as power supply, water supply and access roads, is poor. As a result, it is difficult to attract investments to economic sectors so as to promote the development of the economic sectors. Government funds for infrastructure development are largely lacking. In addition, government capacity is too weak to promote agricultural and industrial development.
- However, the school education system has so degraded that students cannot acquire basic academic skills. As a result, the basic academic skills of young people have declined.

**Table 1 National GDP Composition by Sub-Sector (at constant prices)**  
(Top: Billion Ariary, Bottom: %)

	2007	2008	2009	2010	2011	2012	2013	2014 (*)	2015 (*)	2016 (*)
<b>Primary Sector</b>	4,423.0 (28.8)	4,524.8 (27.8)	4,770.8 (30.3)	4,658.2 (29.6)	4,759.4 (29.7)	4,875.8 (29.4)	4,606.2 (27.4)	4,683.9 (27.0)	4,610.2 (25.9)	4,672.1 (25.4)
Agriculture	2,989.5 (19.5)	3,075.3 (18.9)	3,263.0 (20.8)	3,254.7 (20.7)	3,310.2 (20.7)	3,421.7 (20.6)	3,131.0 (18.6)	3,167.0 (18.2)	3,073.7 (17.3)	3,101.1 (16.9)
Livestock and Fishing	1,266.7 (8.3)	1,281.0 (7.9)	1,287.2 (8.2)	1,180.6 (7.5)	1,233.7 (7.7)	1,248.2 (7.5)	1,266.2 (7.5)	1,304.2 (7.5)	1,321.6 (7.4)	1,354.0 (7.4)
Forestry	166.8 (1.1)	168.5 (1.0)	220.7 (1.4)	222.9 (1.4)	215.5 (1.3)	205.8 (1.2)	208.9 (1.2)	212.8 (1.2)	214.9 (1.2)	217.0 (1.2)
<b>Secondary Sector</b>	2,022.7 (13.2)	2,138.7 (13.1)	2,002.3 (12.7)	2,038.7 (13.0)	2,111.3 (13.2)	2,294.2 (13.8)	2,784.9 (16.6)	2,966.7 (17.1)	3,194.5 (17.9)	3,292.0 (17.9)
Extractive industry	116.0 (0.8)	126.4 (0.8)	118.8 (0.8)	194.4 (1.2)	218.4 (1.4)	356.8 (2.2)	848.0 (5.0)	975.8 (5.6)	1,159.6 (6.5)	1,118.0 (6.1)
Food, drink, tobacco	763.7 (5.0)	803.0 (4.9)	789.0 (5.0)	797.7 (5.1)	819.0 (5.1)	840.4 (5.1)	825.0 (4.9)	846.5 (4.9)	864.3 (4.9)	902.9 (4.9)
Textile	345.7 (2.3)	343.0 (2.1)	314.4 (2.0)	282.8 (1.8)	285.9 (1.8)	288.9 (1.7)	304.9 (1.8)	309.7 (1.8)	299.7 (1.7)	340.3 (1.9)
Wood, paper, printing	174.9 (1.1)	168.2 (1.0)	170.5 (1.1)	184.1 (1.2)	177.9 (1.1)	179.5 (1.1)	184.7 (1.1)	188.8 (1.1)	197.3 (1.1)	212.1 (1.2)
Construction materials	56.4 (0.4)	63.3 (0.4)	59.0 (0.4)	60.9 (0.4)	63.3 (0.4)	65.0 (0.4)	61.1 (0.4)	63.1 (0.4)	64.7 (0.4)	68.1 (0.4)
Metal industry	156.7 (1.0)	219.5 (1.3)	172.6 (1.1)	143.8 (0.9)	165.7 (1.0)	168.6 (1.0)	149.2 (0.9)	153.7 (0.9)	164.9 (0.9)	175.4 (1.0)
Machine, electrical equipment	63.7 (0.4)	48.8 (0.3)	39.1 (0.2)	27.5 (0.2)	24.8 (0.2)	25.1 (0.2)	25.4 (0.2)	25.8 (0.1)	26.3 (0.1)	26.8 (0.1)
Various industries	187.5 (1.2)	197.5 (1.2)	171.0 (1.1)	167.9 (1.1)	170.5 (1.1)	172.8 (1.0)	172.6 (1.0)	175.9 (1.0)	181.9 (1.0)	195.8 (1.1)
Electricity, water, gas	158.1 (1.0)	169.0 (1.0)	167.9 (1.1)	179.8 (1.1)	185.7 (1.2)	197.1 (1.2)	214.1 (1.3)	227.4 (1.3)	235.8 (1.3)	252.6 (1.4)
<b>Tertiary Sector</b>	8,899.0 (58.0)	9,611.0 (59.1)	8,949.1 (56.9)	9,041.3 (57.4)	9,130.2 (57.1)	9,416.9 (56.8)	9,405.1 (56.0)	9,717.3 (55.9)	9,999.1 (56.2)	10,422.7 (56.2)
Public Work	1,285.2 (8.4)	1,663.6 (10.2)	1,370.4 (8.7)	1,412.1 (9.0)	1,460.3 (9.1)	1,511.7 (9.1)	1,482.8 (8.8)	1,529.9 (8.8)	1,677.4 (9.4)	1,778.6 (9.7)
Trade, maintenance, repairs	1,837.9 (12.0)	1,879.9 (11.6)	1,936.2 (12.3)	1,912.6 (12.2)	1,954.4 (12.2)	1,996.6 (12.0)	1,934.5 (11.5)	1,990.2 (11.5)	2,015.5 (11.3)	2,083.4 (11.3)
Hotel, Restaurant	334.6 (2.2)	364.2 (2.2)	178.0 (1.1)	195.5 (1.2)	212.0 (1.3)	239.9 (1.4)	231.5 (1.4)	251.8 (1.4)	258.4 (1.5)	294.3 (1.6)
Transportation	1,424.2 (9.3)	1,510.4 (9.3)	1,317.3 (8.4)	1,352.8 (8.6)	1,342.7 (8.4)	1,413.6 (8.5)	1,465.1 (8.7)	1,486.4 (8.6)	1,498.1 (8.4)	1,568.7 (8.5)
Post and telecommunication	249.0 (1.6)	265.0 (1.6)	296.8 (1.9)	335.6 (2.1)	351.5 (2.2)	371.9 (2.2)	405.3 (2.4)	412.5 (2.4)	394.2 (2.2)	430.8 (2.3)
Bank	326.7 (2.1)	356.0 (2.2)	420.4 (2.7)	405.2 (2.6)	429.8 (2.7)	446.5 (2.7)	465.2 (2.8)	528.4 (3.0)	627.6 (3.5)	677.8 (3.7)
Business services	1,233.4 (8.0)	1,307.1 (8.0)	1,245.6 (7.9)	1,281.9 (8.1)	1,323.3 (8.3)	1,367.1 (8.2)	1,406.9 (8.4)	1,427.7 (8.2)	1,466.4 (8.4)	1,520.9 (8.3)
Administration	1,211.0 (7.9)	1,336.6 (8.2)	1,294.5 (8.2)	1,254.0 (8.0)	1,216.4 (7.6)	1,193.4 (7.2)	1,172.5 (7.0)	1,185.0 (6.8)	1,162.3 (6.5)	1,149.5 (6.3)
Education	509.2 (3.3)	431.2 (2.6)	407.8 (2.6)	407.0 (2.6)	350.6 (2.2)	381.6 (2.3)	343.5 (2.0)	396.7 (2.3)	393.4 (2.2)	389.6 (2.1)
Health	247.5 (1.6)	253.2 (1.6)	231.9 (1.5)	226.9 (1.4)	224.0 (1.4)	222.5 (1.3)	217.7 (1.3)	220.3 (1.3)	219.3 (1.2)	223.8 (1.2)
Services provided to households	240.3 (1.6)	243.9 (1.5)	250.1 (1.6)	257.7 (1.6)	265.1 (1.7)	272.1 (1.6)	280.1 (1.7)	288.6 (1.7)	286.5 (1.6)	305.3 (1.7)
<b>Total</b>	15,344.7 (100.0)	16,274.5 (100.0)	15,722.2 (100.0)	15,738.2 (100.0)	16,000.9 (100.0)	16,586.9 (100.0)	16,796.2 (100.0)	17,367.9 (100.0)	17,803.8 (100.0)	18,386.8 (100.0)

Note: (\*) Provisional Version

Source: JICA Study Team based on National Statistics Institute (INSTAT) (June, 2018)

## **Future Socio-Economy, Changes of External Environment and Development Potential for Madagascar and Overall TaToM Area:**

- Madagascar is a member country of regional economic communities (RECs), such as SADC, COMESA and IORA, as well as AfCFTA. By promoting the regional economic integration related to those organizations, it will become possible to get access to the regional markets with high growth potentiality and to develop economic sectors targeting their regional consumer markets.
- With expansion of Toamasina Port, world largest container vessels will be able to call at the Toamasina Port for transshipment like Port Louis in Mauritius and feeder ships will run from Toamasina Port to ports in the eastern and southern Africa. As a result, access by cargo ships to markets of countries in the Indian Ocean and on the African Continent will become easier, the cost of transport to those countries will be reduced and the possibility of promoting economic sectors targeting regional markets will increase.
- Madagascar's national population growth rates are still high, and its demographic dividend will reach the highest after year 2050.
- Wages of workers in China and Southeast Asia are gradually increasing. Still having cheap, abundant labour force, South Asian countries, like Bangladesh and Pakistan, do not have so large production capacity as China. There are not so many countries that can take over China's position of low cost manufacturing. However, Madagascar is one of such candidate countries for low-cost manufacturing.
- With the rehabilitation of Pangalanes Canal and land development for agriculture along the canal, agricultural production targeting world markets will increase. There is a possibility to develop processing industry in Toamasina Agglomeration, using part of the agricultural products from Pangalanes Canal.

**Selected Growth Scenario for Overall TaToM Area:** Three alternative growth scenarios are identified for the Overall TaToM Area considering 1) Possible locations of light industries and agro-processing industries, as well as of textile industries in the Overall TaToM Area and 2) How to improve the connectivity between Antananarivo and Toamasina to support the economic growth of Overall TaToM Area. Growth Scenario C aims at establishment of Antananarivo Service-Industrial Metropolis in connection with a strong economic axis with Toamasina Industrial City, based on the rapid growth of economic sectors as a whole of the Overall TaToM Area. For following this growth scenario, much effort at development of economic sectors will be made both for Antananarivo Agglomeration and Toamasina Agglomeration, by emphasizing the attraction of investments to textile industries, agro-processing industries and other light industries.

## **Socio-Economic Framework for TaToM Area**

The population of Overall TaToM Area in 2033 is estimated to reach 9.4 million accounting one fourths of the total population of Madagascar. In Antananarivo Agglomeration and Toamasina Agglomeration, the population will become 4.2 million and 0.8 million respectively by 2033. The Gross Regional Domestic Product (GRDP) in 2033 for Overall TaToM Area is estimated to reach 34,308 million Ariary (at 2007 constant prices) equivalent to 21,113 million US dollar (at 2010 constant prices), which is four times larger than the current GRDP. The share of GRDP to national GDP will become 58.7%. The GDP per capita for Overall TaToM Area will also increase and reach 3.7 million Ariary (equivalent to approximately 2,250 USD) by 2033.

**Table 2 Future Population, GRDP and GDP per Capita of Overall TaToM Area**

	Unit	2014	2023	2028	2033
Population		5,683,080	7,286,638	8,286,628	9,388,468
Annual Growth Rate			2.80%	2.61%	2.53%
GRDP	MGA Billion, at 2007 constant prices	8,154	14,503	21,812	34,308
	USD Million, at 2010 constant prices	5,018	8,925	13,423	21,113
Annual Growth Rate			6.61%	8.50%	9.48%
GDP per Capita	MGA, at 2007 constant prices	1,434,785	1,990,355	2,632,192	3,654,270
	USD, at 2010 constant prices	883	1,225	1,620	2,249
Annual Growth Rate			3.70%	5.75%	6.78%

Source: JICA Study Team based on various data

**Table 3 Future Population Framework for Antananarivo Agglomeration**

		2018	2023	2028	2033
CUA	Population	1,275,207	1,426,472	1,586,890	1,763,099
	Annual Growth Rate	-	2.27%	2.15%	2.13%
Outside CUA	Population	1,283,038	1,596,175	1,960,581	2,388,368
	Annual Growth Rate	-	4.46%	4.20%	4.03%
Antananarivo Agglomeration	Population	2,558,245	3,022,647	3,547,471	4,151,467
	Annual Growth Rate	-	3.39%	3.25%	3.19%

Source: JICA Study Team based on data from INSTAT

**Table 4 Future Population Framework for Toamasina Agglomeration**

		2018	2023	2028	2033
CUT	Population	326,286	379,373	440,170	506,111
	Annual Growth Rate	-	3.06%	3.02%	2.83%
Outside CUT	Population	110,718	141,618	186,691	256,728
	Annual Growth Rate	-	5.05%	5.68%	6.58%
Toamasina Agglomeration	Population	437,004	520,991	626,861	762,839
	Annual Growth Rate	-	3.58%	3.77%	4.01%

Source: JICA Study Team based on data from INSTAT

## **Revision of PUDi for Antananarivo Agglomeration**

### **Future Vision for Antananarivo Agglomeration**

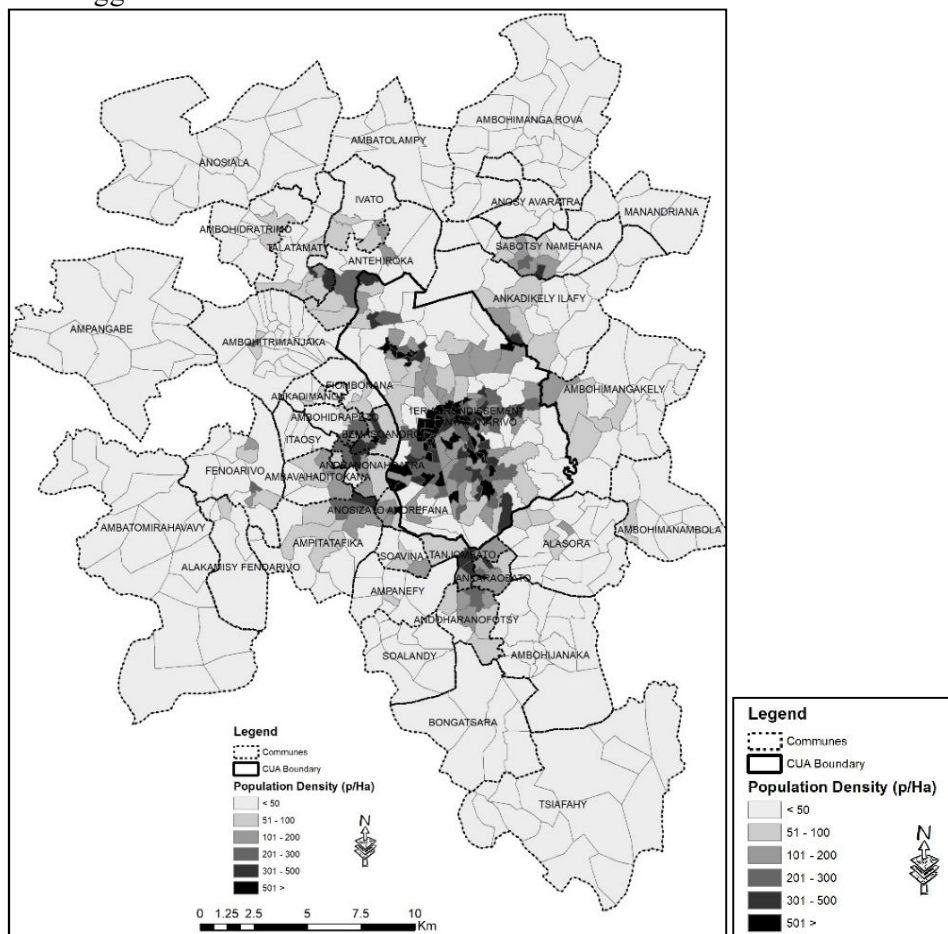
In addition to the national centre of government and economy, Antananarivo Agglomeration will be **a thriving production centre and a modern life centre**, which is not only to support the welfare of people of Antananarivo Agglomeration, but also the national economy of Madagascar.

In order to develop such a centre, Antananarivo Agglomeration will create a competitive and vibrant economy, while seeking inclusive and sustainable development, by creating a healthy, resilient, interconnected urban structure and by preserving and strengthening its unique identity.

### **Characteristics and Problems on Urban Development of Antananarivo Agglomeration**

- In Antananarivo Agglomeration, economic sectors have not been sufficiently developed so that it cannot generate enough employment opportunities for the large number of population.
- Business support functions of Antananarivo Agglomeration are still weak in promoting the development of economic sectors for Antananarivo Agglomeration and other regions.
- In Antananarivo Agglomeration, land for manufacturing and logistics industries is lacking inside and outside CUA.
- The logistics function in Antananarivo Agglomeration is inefficient so that it cannot support the development of the economic sectors.
- Many urban functions and population are over concentrated within CUA. As a result, serious traffic congestion disrupts economic and social activities in Antananarivo and its surrounding areas.
- Due to the extremely high population density, a healthy living environment is not maintained in some areas in CUA
- There is an issue with sanitation in CUA because the population density is very high and sewerage treatment is not properly done.
- Because of underdeveloped public transportation, the mobility in urban life is constrained and travelling results in loss of time. Travelling is sometimes dangerous.
- Housing provision is inadequate in terms of quantity and quality, compared with the rapid population growth in Antananarivo Agglomeration
- Urban amenities, such as parks and open space, is lacking both inside and outside CUA in Antananarivo Agglomeration.
- Water Supply: The water supply master plan formulated in 2003 does not intend to provide water for the current entire population of Antananarivo Agglomeration. Current water production is insufficient. Water resource development and additional water treatment plants are necessary for water supply targeting the outside of CUA for promoting suburbanization.

- **Power Supply:** If WB's Electricity Sector Operations and Governance Improvement Project (PAGOSE) is implemented, the power generation can satisfy the potential demand. However, facility development for distribution of electricity is urgently needed. In particular, development of transmission and distribution facilities to the urbanized areas outside CUA is necessary.
- **Education Facilities:** The classrooms of public primary and secondary schools are lacking in CUA, while the classrooms of public secondary and high school are not enough outside CUA.
- **Health Service Facilities:** Public CSBs are insufficient in populated CUA and its adjacent areas. There is a problem with the quality of medical services of public hospitals.
- **Risk for inundation due to rainfall flooding** is rising in CUA partly because the decline of wetlands and paddy fields have deprived CUA of water retaining function and partly because the mal-maintenance of drainage facilities decreased the capacity of draining of water from CUA.
- **The risk of river flooding** is increasing outside CUA partly due to the decrease of paddy fields by land filling for the expansion of urban areas and partly due to the deterioration of irrigation canals.
- **The physical environment** (in other words, landscape) which reflects the traditional identity of Antananarivo and its surrounding areas has been disappearing in the urbanization in Antananarivo Agglomeration



Source: JICA Study Team based on data from INSTAT



#### Figure 4 Landscape reflecting the Identity of Antananarivo and its Surrounding Areas

## **Selected Growth Scenerio for Antananarivo Agglomeration**

In order to continuously create employment opportunities for the increasing population in the agglomeration and to revitalize the urban economy, Antananarivo Agglomeration needs new export-oriented industries which can lead not only its own urban economy, but also Madagascar's national economy. The export-oriented industry should target the growing regional markets of recently developing "Free Trade Areas" in African and the Indian Ocean countries. Madagascar is a member country of SADC, COMESA and IORA, as well as AfCFTA.

The selected growth scenario for Antananarivo Agglomeration will accommodate a variety of economic sectors aiming at balanced development of the two agglomerations. With construction of the Outer Ring Road, industrial areas will be developed in the north of Ivato Airport and the area along the Outer Ring Road.

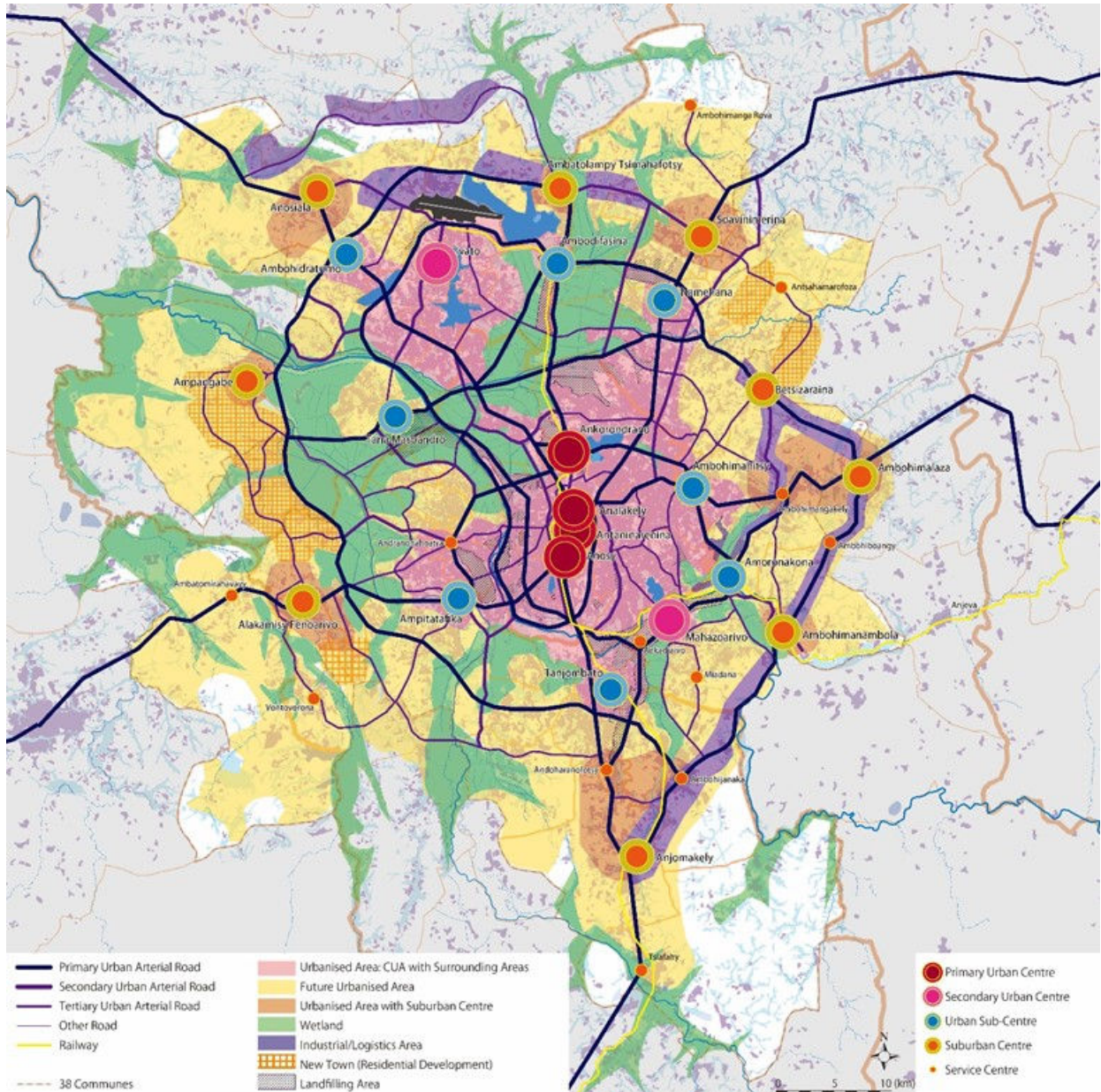
By upgrading business support functions in addition to the function as the centre of politics and government, Antananarivo Agglomeration will support not only the economic sectors in Antananarivo Agglomeration, but also the industries in Toamasina Agglomeration and other areas, and will attract investment not only to Antananarivo Agglomeration, but also to other areas including Toamasina Agglomeration. Then more highly advanced service industries, such as health, education and research, should be developed within CUA for attracting investments to economic sectors in Antananarivo Agglomeration. It is also necessary to develop and distribute commercial and service functions outside CUA for supporting the lives of people.

## **Urban Development Strategies, Urban Structure, and Land Use Policies for Antananarivo Agglomeration**

- (1) **Overall strategies for Antananarivo Agglomeration** are formulated by restructuring the urban structure as follows:
  - To strengthen urban centre functions within the CUA, especially those of accommodating the headquarters of international, regional and national corporations and organizations
  - To develop new urban centres outside the CUA and to provide basic infrastructures, such as electricity, water supply and access roads, in the outside of CUA, in order to promote suburbanization outside CUA
  - To strengthen the radial road capacities connecting the inside of CUA and the outside of CUA in order to promote diffusion of population and urban functions to the outside of CUA within Antananarivo Agglomeration
  - To construct an Outer Ring Road for strengthening the connectivity with Toamasina Port and for creating enough land for attracting industries and logistics facilities along the sections of the Outer Ring Roads near the National Road No.2 (NR2)
  - To improve the high-density residential environment within CUA by inserting local roads with gutters and providing water supply infrastructure
  - To enhance the water retarding capacity of urban areas of CUA by maintaining and constructing water retarding ponds and by enforcing land use regulations
  - To selectively conserve wetland paddy fields by rehabilitating irrigation facilities for agricultural fields
- (2) **The urban structure for the selected scenario of Antananarivo Agglomeration** has the characteristics listed below.
  - Four primary urban centres in CUA will make the urban core for Antananarivo Agglomeration. Furthermore, the linear connection between Ivato Airport, Ivato business centre (secondary urban center) and the primary urban centres will be strengthened, in order to enhance the service industry and trade and commerce industry. The areas to be supported by the strong connectivity among primary and secondary urban centres compose an urban central axis.
  - Urban sub-centres and suburban centres outside CUA will be developed for upgrading the urban function of Antananarivo Agglomeration. The connection between sub-centres and suburban centres and primary urban centres will be strengthened by widening or constructing radial roads.



- An Outer Ring Road will connect these suburban centres. The Outer Ring Road will create new industrial land in the periphery of the agglomeration, especially in the area north of Ivato Airport, and in the north east area between National Road No. 2 (NR2) and National Road No. 3 (NR3). At the same time, this area with strong access to NR2, linked to Toamasina Port is suitable for industrial development. In addition, large-scale industrial parks will be developed along this bypass road from NR2 to NR7. This bypass road will enhance the connectivity between Antananarivo, Toamasina and Antsirabe.
- The new town areas in the east and west of Antananarivo Agglomeration are connected by east-west roads to serve the accessibility to the urban core



**Figure 5 Future Urban Structure for Antananarivo Agglomeration**

**(3) Land use policies for Antananarivo Agglomeration** are summarized below.

- High and mid-density residential areas will be further expanded and the height of residential buildings will be increased.
- Outside CUA, the development of middle-density residential areas including middle-rise mid-density residential areas, will be promoted along the radial roads and in the surrounding of urban sub-centres.
- Outside the Outer Ring Road, the development of low-density residential areas is promoted. Outside the Outer Ring Road, in some areas, the development of new towns accommodating

middle-rise mid-density residential areas is promoted in order to accommodate increasing low and middle income populations.

- Within CUA, commercial areas including office areas will be expanded along newly constructed major roads, as well as in existing commercial centres, such as Analakely and Ankorondrano. More height of commercial buildings will be allowed in commercial areas.
- Outside CUA, the commercial function of these existing commercial areas will be upgraded to be “Urban Sub-Centres”, the area size of these existing commercial areas will be expanded, and their building height will be increased, in respond to planned development of arterial road network.
- Around the planned Outer Ring Road, suburban centres will be developed in order to accommodate not only commercial/office areas, but also other urban functions.
- The existing industrial areas will be transformed to commercial/office and residential areas under a mixed land use category.
- Industrial areas will be largely expanded in suburban areas along the planned Outer Ring Road, which could have good connection to Toamasina Port through the existing NR2 and/or through the prospective Antananarivo-Toamasina Expressway.
- Conservation of wetlands will be done in order to maintain the water retention capacity of 15 million m<sup>3</sup> within CUA, in accordance with PIAA’s Drainage Master Plan.
- There are many planned urban development in association with land filling in wetlands, and there is also possibility of spontaneous land filling in wetland. It will be necessary to strictly control the volume of wetland land filling by two methods. The one is land use zoning regulation, which is shown in the land use zoning plan of PUDi. The other is to construct water retention ponds in certain urban areas under high urbanization pressure.
- Outside CUA, there are wide areas under threats of inundation from heavy rainfall and flooding of rivers. In the future, land filling in wetlands outside CUA will be limited to the cases of high necessity, especially for development of urban sub-centres and construction of major roads.
- The demand for city parks and sports grounds will increase largely. Therefore, potential lands for city parks and sports grounds are designated by the revised PUDi. Such potential lands include 1) areas surrounding water retention ponds, 2) unused lands in highly populated areas, and 3) forested lands in suburban areas.

Based on the above land use policies for Antananarivo Agglomeration, a land use zoning plan covering Antananarivo Agglomeration is prepared at a scale of 1:10,000.

### **Action Plan for Integrated Urban Development in Antananarivo Agglomeration**

In order to implement the Revised PUDi for Antananarivo Agglomeration, an Action Plan is formulated by consisting of the following three sets of actions:

- Capacity Development for Communes in Utilization of Land Use Zoning Regulations in Antananarivo Agglomeration
- Action Areas to Promote Integrated Urban Development in Antananarivo Agglomeration
- Priority Projects and High Priority Projects of Various Sectors in Antananarivo Agglomeration

There are **17 Action Areas** designated for promoting integrated development in Antananarivo Agglomeration.

**99 priority projects** are identified for Antananarivo Agglomeration covering economic sectors, infrastructure sectors and urban development sector to implement the strategies in accordance with the selected growth scenario. These priority projects are organized into four phases which are Phase 1: 2019-2023, Phase 2: 2024-2028, Phase 3: 2029-2033 and Phase 4: 2034-2038.

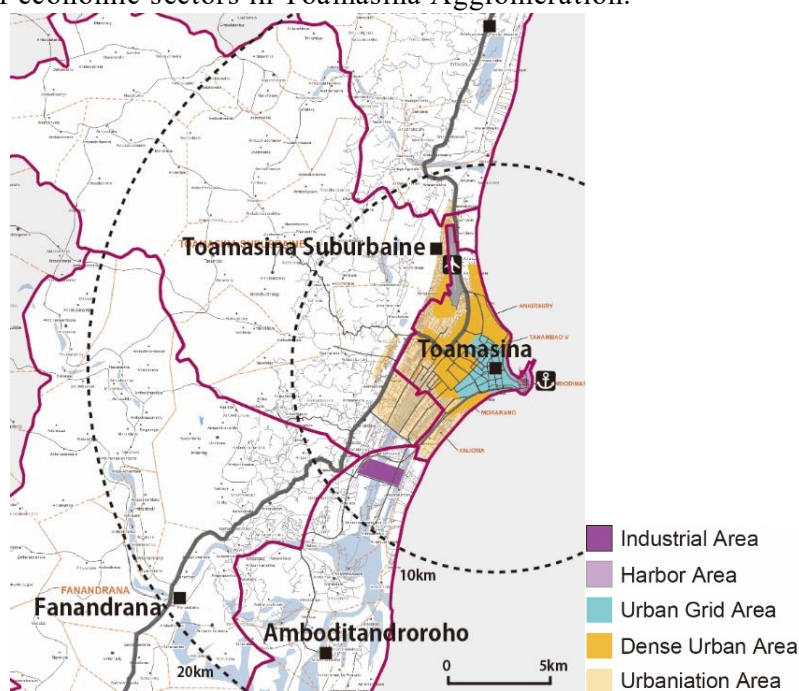
## **Revision of PUDi for Toamasina Agglomeration**

### **Future Vision for Toamasina Agglomeration**

Based on its enhanced gateway function connecting sea transport and land transport, Toamasina Agglomeration will be a thriving industrial hub and major tourist destination in the Indian Ocean, around the international Port of Toamasina, with a healthy lifestyle and beauty of Pangalanes Canal along with coastal and mountainous landscapes enjoyed by the residents and tourists as well.

### **Characteristics and Problems on Urban Development of Toamasina Agglomeration**

- In CUT, basic infrastructure (e.g., for power and water supply), and social services are significantly lacking while population and urban functions are over concentrated in this area.
- It is difficult to promote development of economic sectors because of inadequate infrastructure, such as for power and water supply.
- Because urbanisation has been progressing in low-lying areas and maintenance of the drainage infrastructure has been insufficient, rainwater flooding occurs almost every year.
- Public transport is not well developed.
- There are not enough hospitals, educational facilities, and recreation facilities for middle-income people.
- It takes 8 hours by passenger car or 2 days by cargo freight to travel 350 km distance on NR2 from Antananarivo, the capital of the country as well as the centre of the economy.
- Due to the time cost and transport cost between Antananarivo and Toamasina, the function of the Port of Toamasina (the primary major port of Madagascar), is not fully utilised for the development of economic sectors in Toamasina Agglomeration.



**Figure 6 Urbanised Areas in Toamasina Agglomeration in 2017**

### **Selected Growth Scenerio for Toamasina Agglomeration**

The selected growth scenerio for Toamasina Agglomeration aims to develop economic sectors in Toamasina Agglomeration, in addition to logistics industry. The advantage of strategic location of Toamasina will be fully utilised to develop light industry and agro-processing for export and transhipment targeting the regional markets in Africa and around the Indian Ocean. In parallel, logistics function will be enhanced to support the port function as a gateway of the country, in particular, that of Antananarivo Agglomeration. As a result, industrial areas will be expanded to



suburban areas of CUT and in adjacent communes. Tourism will be also promoted by developing tourism development zones along the coast where luxury hotel resorts, shopping malls, and leisure facilities are to be located. Toamasina Agglomeration will be also the market for towns and villages in the hinterland and those in other coastal regions connected by sea.

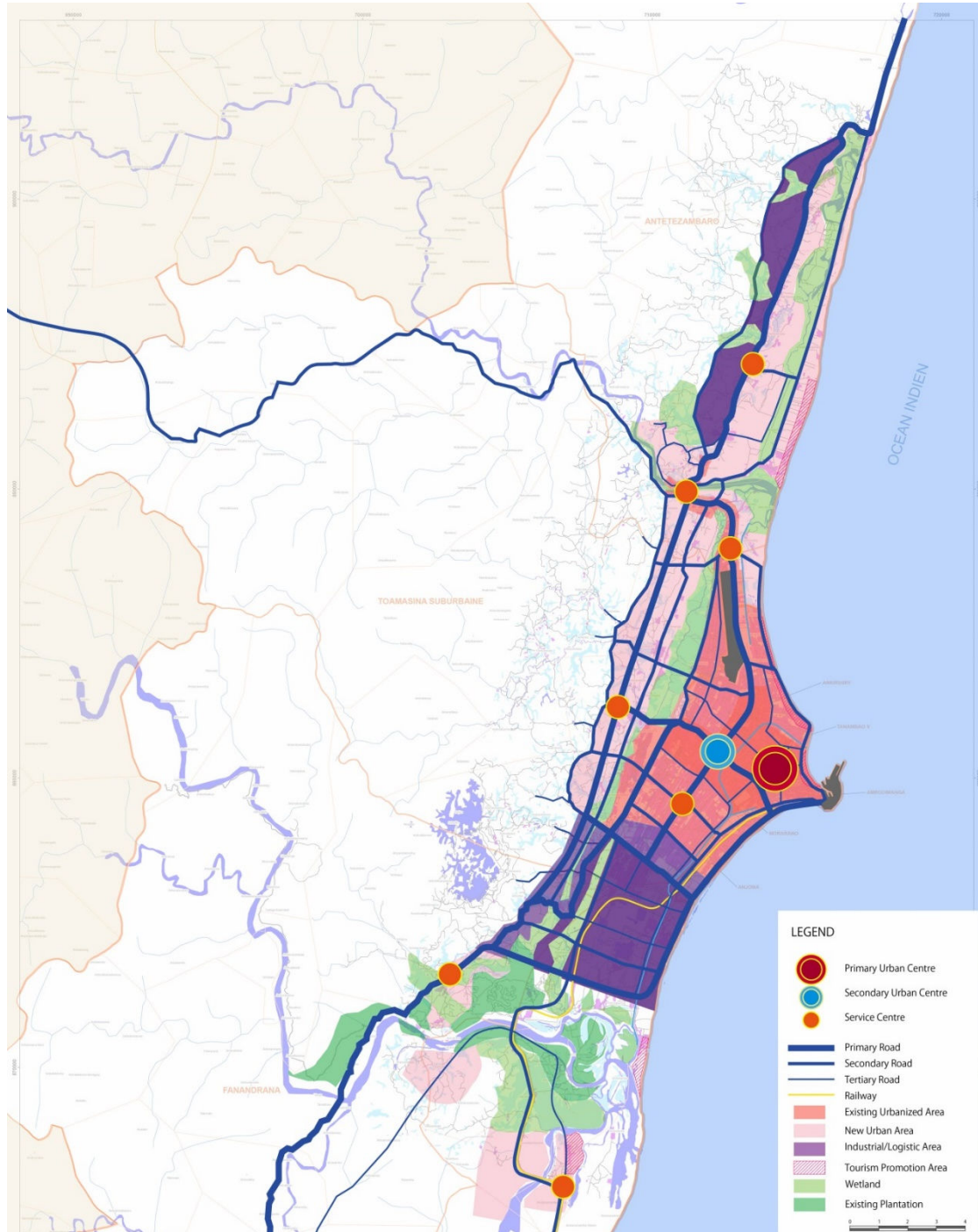
Toamasina Agglomeration will be a vibrant hub of industry and shall be an attractive coastal tourism town, while supporting the economy of Antananarivo, for the sake of balanced development.

### **Urban Development Strategies, Urban Structure, and Land Use Policies for Toamasina Agglomeration**

- (1) **Overall strategies on urban development for Toamasina Agglomeration** are formulated as follows:
  - To implement necessary strategies to establish an efficient logistics system based on Toamasina Port to be expanded
  - To implement a set of development strategies focusing on the promotion of economic sectors, specifically light industries and agro-processing industries targeting regional consumer markets, in order to transform Toamasina Agglomeration into a thriving industry city
  - To set up Economic Development Zones and develop industrial parks, together with providing economic infrastructure including access roads, electricity supply and water supply, for attracting investments to light industries targeting the markets of Free Trade Areas of the Regional Economic Organizations with which Madagascar is affiliated
  - To promote international and domestic tourism by setting up Tourism Development Zones and hotel zones for purposes of attracting investment to hotels, based on the existing infrastructure. The results of this measure on tourism development will be also effective eventually in attracting investments to industries.
- (2) **The urban structure for the selected scenario of Toamasina Agglomeration** has the characteristics listed below.
  - There will be three access roads to Toamasina Port from NR2 for the purpose of strengthening of the accessibility to Toamasina Port.
  - A western bypass road will be constructed to support the industrial area located to the north beyond the Ivoloïna River.
  - Large industrial areas will be established to accommodate new manufacturing industries and logistic industries, along with hotel zones for international and domestic tourists. Industrial zones for manufacturing industries and logistic industries are located in the north and the south of Ambatovy Factory, and also to the north beyond the Ivoloïna River.
  - Residential areas will be expanded to the north beyond the Ivoloïna River, southwards until the industrial zone, and also to the west of Toamasina Airport and beyond the wetlands.
  - Urban centres will remain in and around CUT. New urban centres will be developed along National Road No.5 (NR5): one just north of Toamasina Airport, another close to the Ivoloïna River, and also one area in the north of the Ivoloïna River.
- (3) **Land use policies for Toamasina Agglomeration** are summarized below.
  - High and mid-density residential areas will be further expanded and the height of residential buildings will be increased.
  - Outside CUT, the development of low-density residential areas, will be promoted along the north and south of CUT in the surrounding of urban sub-centres.
  - Within CUT, commercial areas including office areas will be expanded along major roads, as well as in existing commercial centres, such as Ankirihiry. More height of commercial buildings will be allowed in commercial areas.
  - Outside CUT, the commercial function of these existing commercial areas will be upgraded to be “Service Centres.” Service centres will be developed in order to accommodate not only commercial/office areas, but also other urban functions.
  - The coastal area in CUT has risk of erosion. It is necessary to protect these areas from development. However, such areas are also tourism potential area. In the future, it is necessary to limit certain development to protect the coastal area and also avoid effect from coastal erosion.

- There are still large areas with unspoiled environment outside CUT which has mangroves. In the future, limited development for tourism promotion will be allowed but only to certain extent.

Based on the above land use policies for Toamasina Agglomeration, a land use zoning plan covering the area to be urbanised by 2038 within Toamasina Agglomeration is prepared at a scale of 1:10,000.



Source: JICA Study Team

**Figure 7 Future Urban Structure for Toamasina Agglomeration**

### **Action Plan for Integrated Urban Development in Toamasina Agglomeration**

In order to implement the Revised PUDi for Toamasina Agglomeration, an Action Plan is formulated by consisting of the following three sets of actions:

- Capacity Development for Communes in Utilization of Land Use Zoning Regulations in Toamasina Agglomeration
- Action Areas to Promote Integrated Urban Development in Toamasina Agglomeration
- Priority Projects and High Priority Projects of Various Sectors in Toamasina Agglomeration

There are **three Action Areas** designated for promoting integrated development in Toamasina Agglomeration.

**32 priority projects** are identified for Toamasina Agglomeration covering economic sectors, infrastructure sectors and urban development sector to implement the strategies in accordance with the selected growth scenario. These priority projects are organized into four phases which are Phase 1: 2019-2023, Phase 2: 2024-2028, Phase 3: 2029-2033 and Phase 4: 2034-2038.

## **Transport and Territorial Development Plan for TaToM Economic Axis**

### **Future Vision for TaToM Economic Axis**

TaToM Economic Axis will continue to be the most important transport axis for Madagascar because its connectivity by NR2 and railway would be the basis for sustainable development of economic sectors of both Antananarivo Agglomeration and Toamasina Agglomeration. Since the two agglomerations are expected to grow their economic sectors, the importance of the transport function of TaToM Economic Axis will become much larger than that at present.

Together with the transport systems of Antananarivo and Toamasina Agglomerations, TaToM Economic Axis will contribute to the enhancement of the connectivity between Antananarivo and other regions and the connectivity between Toamasina Port and other regions within Madagascar.

Based on an upgraded connectivity through the TaToM Economic Axis, urban and rural economies of Moramanga, Brickaville, Manjakandriana and Antsampenana will flourish not only by expansion of trade and vehicle repairing services for passengers and cargo trucks, but also by investment to economic sectors taking advantage of proximity to Toamasina Port.

### **Characteristics and Problems on TaToM Economic Axis**

- The cities and villages in TaToM Economic Axis connecting Antananarivo Agglomeration and Toamasina Agglomeration have locational advantage for economic development compared with other cities and villages in Madagascar. However, economic activities have not yet been facilitated and are limited. In some of the cities and villages, the main source of income for the residents are small business on trade and car repairing for road users of NR2.
- In 2019, the government of Mauritius agreed to develop an industrial park for textile industry in Moramanga. However, at present, there is no skilled labour for such industry in Moramanga and it will be a challenge to attract necessary workforce to Moramanga, as well as to develop existing human resources of Moramanga.
- There are also national parks in TaToM Economic Axis accessible from NR2, which attract tourist. The most recognized is Mantadia National Park in Andasibe, where a few kinds of lemurs habitat. Due to this national park, some hotels and restaurants for both national and international tourists are located around Andasibe.
- Although NR2 and railway between Antananarivo and Toamasina composed an essential transport corridor for Madagascar, the traffic volume of NR2 was limited to around 1,700 vehicles per day (2018) and the cargo volume of the railway was around 96,000 tonne per year (2017).
- Antananarivo and Toamasina has approximately 1,400m difference of elevation. NR2 has to go through mountainous areas. Therefore, NR2's horizontal and vertical alignments are so bad that it is very costly to improve the horizontal and vertical alignments for the purpose of increasing transport volume and travel speed on NR2.
- The railway for cargo runs between Antananarivo and Toamasina, transporting mainly fuel.

However, passenger train only runs between Moramanga and Toamasina once or twice a week. The railway infrastructure has been degraded due to heavy rainfall and shortage of maintenance and rehabilitation budgets. It is also necessary to improve the alignment partly to ensure its sufficient functioning.

- For the economic development of Madagascar, it is important for Antananarivo Agglomeration and Toamasina Agglomeration to promote economic sectors development. However, the current transportation system of TaToM Economic Axis does not have sufficient safety to support the two economic hubs. Furthermore, the capacity of transportation system will not be sufficient to satisfy the future demand of Antananarivo Agglomeration.

### **Selected Growth Scenario for TaToM Economic Axis**

The improvement of the transportation function of TaToM Economic Axis is required for promoting industrial development in both Antananarivo Agglomeration and Toamasina Agglomeration.

The selected growth scenario will make the following two different efforts at developing the transportation system of TaToM Economic Axis for the economic development of two agglomeration:

- Upgrade the cargo transport volume for the development of economic sectors of Antananarivo Agglomeration
- Increase the speed of transport for the development of economic sectors of Toamasina Agglomeration

For the development of each agglomeration, the development of transportation system of TaToM Economic Axis is essential. However, the cost of necessary measures to develop the transportation system of TaToM Economic Axis are not cheap. Therefore, it is important that each measure brings benefit to not only one agglomeration but to both agglomerations for sustainable development of the TaToM Economic Axis.

Since the selected scenario aims to develop the economic sectors in both Antananarivo and Toamasina Agglomeration, it will enhance the development of the transportation system of TaToM Economic Axis.

### **Overall Development Strategies for TaToM Economic Axis**

(1) The following **overall strategies** are formulated for **TaToM Economic Axis**:

- To strengthen the transport capacity for basic materials (e.g., fuel, industrial raw materials, and intermediate goods) and consumer goods from Toamasina Port to Antananarivo Agglomeration to hasten the activities of economic sectors and everyday life of residents in Antananarivo Agglomeration and also support the economic development in Moramanga.
- To improve cargo transport between Toamasina Port and Antananarivo Agglomeration considering, firstly, safety and resilience; secondly, transport capacity; and thirdly, transport speed in the TaToM Economic Axis.
- To prepare the investment environment that facilitates decisions of investments to economic sectors of Toamasina Agglomeration, and to create the business environment for better business/industrial management of its economic sectors, by improving the speed of passenger transport between Toamasina and Antananarivo Agglomerations.
- To improve passenger transport between Toamasina and Antananarivo Agglomerations considering, firstly, safety and resilience; secondly, travel speed; and thirdly, transport capacity in the TaToM Economic Axis.

(2) The **transportation system for the selected scenario** has the characteristics listed below.

- A safe and resilient connectivity between Antananarivo and Toamasina is ensured through installation of safety devices and implementation of work for resilience on NR2.
- Passenger cars' higher speed is ensured through the construction of climbing lanes on the prioritized sections of NR2 between Antananarivo and Moramanga. This construction work

will start in the middle of Phase 1, and continue throughout Phase 2.

- Cargo transport volume is upgraded by partial operation of motorway, and also by continuing the rehabilitation of railway infrastructure.

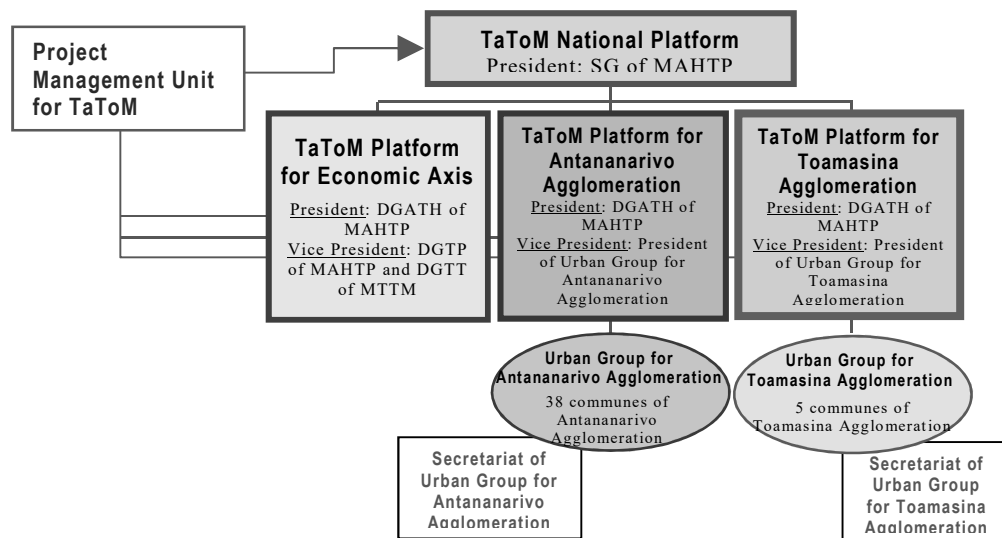
### **Priority Projects for Development of TaToM Economic Axis**

Transport and Territorial Development Plan for TaToM Economic Axis covers the transportation system between Antananraivo Agglomeration and Toamasina Agglomeration, and Economic Development Plan for Moramanga.

17 priority projects are identified for TaToM Economic Axis covering economic sectors and transport sector to implement the strategies in accordance with the selected growth scenario. These priority projects are organized into three phases which are phase 1: 2019-2023, phase 2: 2024-2028 and phase 3: 2029-2033.

## **Implementation Framework for TaToM**

An implementation framework for TaToM is recommended by Project TaToM as presented in Figure 8, based on the framework for formulating the plans under Project TaToM.



Source: JICA Study Team

**Figure 8 Implementation Framework for TaToM**

# PART I

## INTRODUCTION

# Chapter 1 Introduction

## 1.1 Background

Since its independence in 1960, Madagascar has gone through a number of political crises, namely, protests by farmers and students called “rotaka,” turmoil during several elections, two political crises by the military, and an assassination of the president. The prolonged political crises brought about a devastating impact on the nation’s economy, international relations, and living standards, and have hampered investments in urban development and social infrastructure. The Malagasy economy was hit hard by the political crises in 2001 and 2009 as well as the world financial crisis in 2008. The poverty rate jumped to 75.5% in 2010. Not only because the international community did not endorse the new regime that came to power without going through a democratic procedure after the 2009 political crisis, but also because the European Union and the United States suspended the export quotas of textiles given to Madagascar, therefore the national economy depending on the textile and garment exports was severely damaged.

The democratic presidential election held in 2013 was expected to bring about political stability to the country; however, the new administration faced mounting criticism by the citizens. After the president’s party won the majority of the seats in the Senate election in December 2015, the new cabinet was organized in April 2016 and eventually the political situation became stabilized. Consequently international economic cooperation and assistance from Japan and other donors were resumed. Now a number of international assistance projects are on-going and under preparation.

Urban master plans (PUDi: *Plan d’Urbanisme Directeur*) were prepared for the Antananarivo Agglomeration, the capital of politics and economy of the country, in 1974, 1985, 2004, and 2007. However, those plans were not fully implemented. Currently, illegal construction and development have been mushrooming due to rapid population growth and uncontrolled urbanisation. Informal settlements have emerged in lowlands which are not only prone to rainwater inundation but also with problems of public safety. It is anticipated that the lack of infrastructure adversely affects the economic activities and functions of the national capital, and leads to the deterioration of the living environment. Meanwhile, the Toamasina Agglomeration located on the east coast of the country, has an important international port, Toamasina Port, which is a gateway of goods to the Antananarivo Agglomeration, as well as a hub of export of processed goods and agricultural products. However, infrastructure that supports industry and people’s lives has not been sufficiently developed, and industrial development has been delayed.

Hence, in order to strengthen the political, administrative, and economic functions of the Antananarivo Agglomeration as the national capital, to develop disaster resilience and a liveable environment, and to create a stately character and appeal of the capital, it is an urgent task to formulate an Urban Master Plan, which entails a future vision, urban structure based the vision, a land use plan, and infrastructure development plans. At the same time, it is important to accelerate the economic development of Madagascar by creating synergy through supporting urban and industrial development of the Toamasina Agglomeration and the development of a transport route (economic axis) connecting the two agglomerations. For the sake of these stated objectives, the Government of Madagascar requested the Government of Japan to provide assistance to formulate and revise the PUDis for Antananarivo and Toamasina Agglomerations, and develop a transport and territorial development plan for the economic axis.

## 1.2 Objectives and Outputs of the Project

The objective of the Project is to formulate Urban Master Plans (PUDis) for Antananarivo Agglomeration and Toamasina Agglomeration, and a Transport and Territorial Development Plan for the economic axis connecting the two agglomerations. During the formulation process of these three plans, growth scenarios at the regional level were also considered to bring out synergetic effect not only to the TaToM area but also to Madagascar as a whole.

The outputs of the Project are as follows:

- PUDi for Antananarivo Agglomeration 2004 is revised.
- PUDi for Toamasina Agglomeration 2004 is revised.
- Transport and Territorial Development Plan for TaToM Economic Axis is formulated
- A mechanism for coordination, monitoring, and management of the implementation of the formulated plans is established.

By implementing these plans formulated by the Project on Master Plan Formulation for Economic Axis of Antananarivo-Toamasina, Madagascar (Project TaToM), it is expected to promote development of the two agglomerations and strengthen connectivity between them for integrated and sustainable economic growth.

## 1.3 Study Areas and Planning Areas of the Project

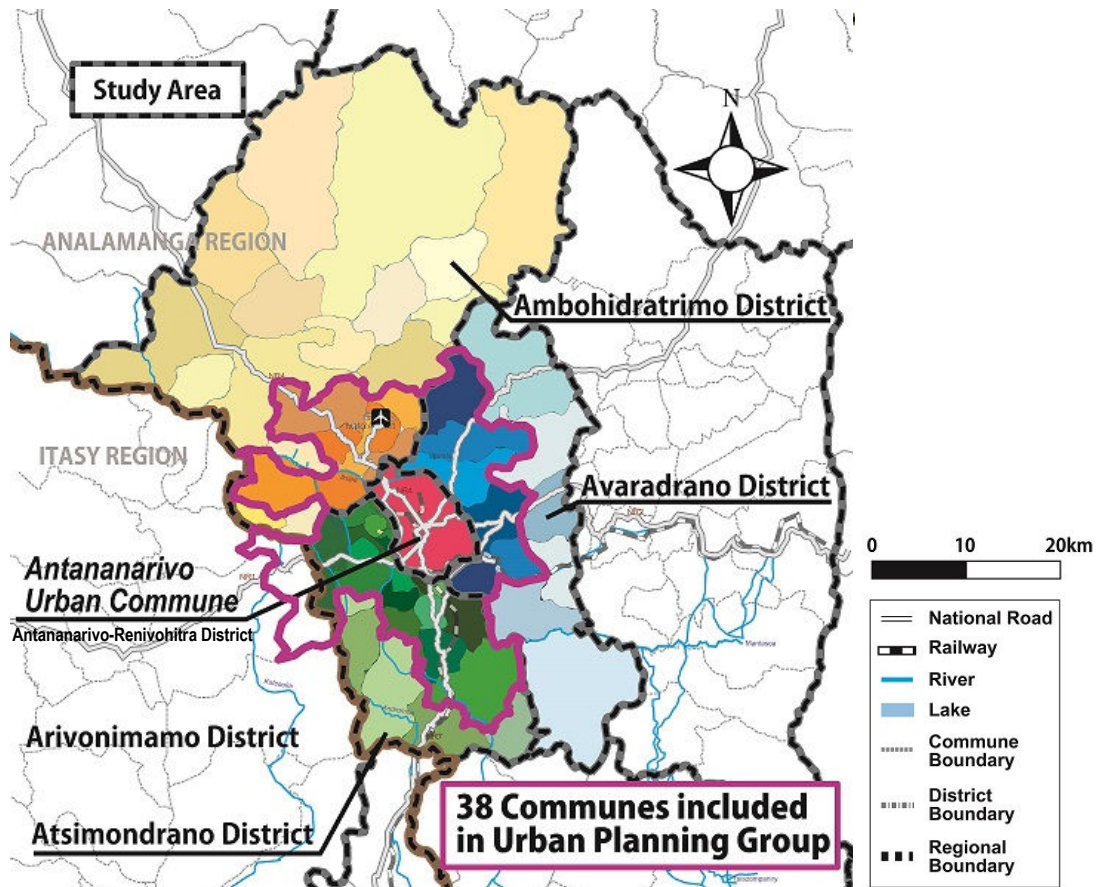
### 1.3.1 Study Areas for the Project

The Study Areas for the Project covers the following areas:

- The Study Area for Antananarivo Agglomeration is four districts, namely, Antananarivo-Renivohitra District (also known as Antananarivo Urban Commune (CUA: *Commune Urbaine d'Antananarivo*)), Ambohidratrimo District, Atsimondrano District and Avaradrano District, and Ambatomirahavavy Rural Commune in Arivonimamo District, Itasy Region.
- The Study Area for Toamasina Agglomeration is Toamasina Urban Commune (CUT: *Commune Urbaine de Toamasina*), Toamasina Suburbaine Rural Commune, Antetetzambara Rural Commune, Amboditandroho Rural Commune and Fanandrana Rural Commune.
- The Study Area for Antananarivo – Toamasina Economic Axis is the areas along National Road No. 2 (NR2) and along the railway between Antananarivo and Toamasina.

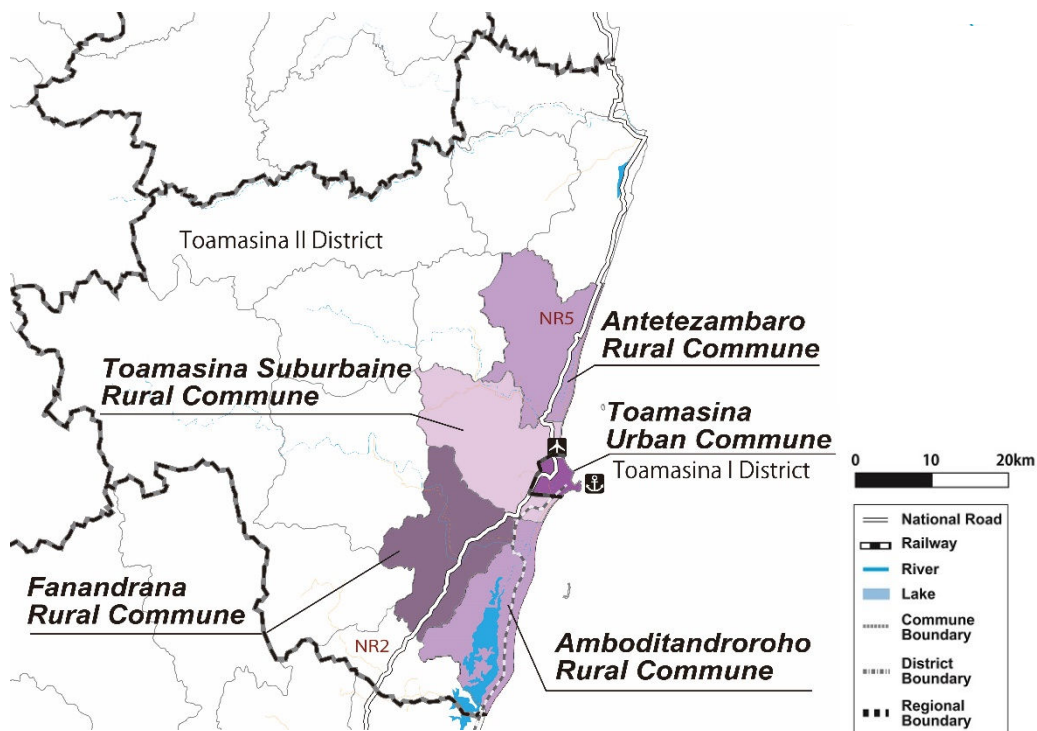
These Study Areas for the two agglomerations are determined as Antananarivo Sub-Region and Toamasina Sub-Region.





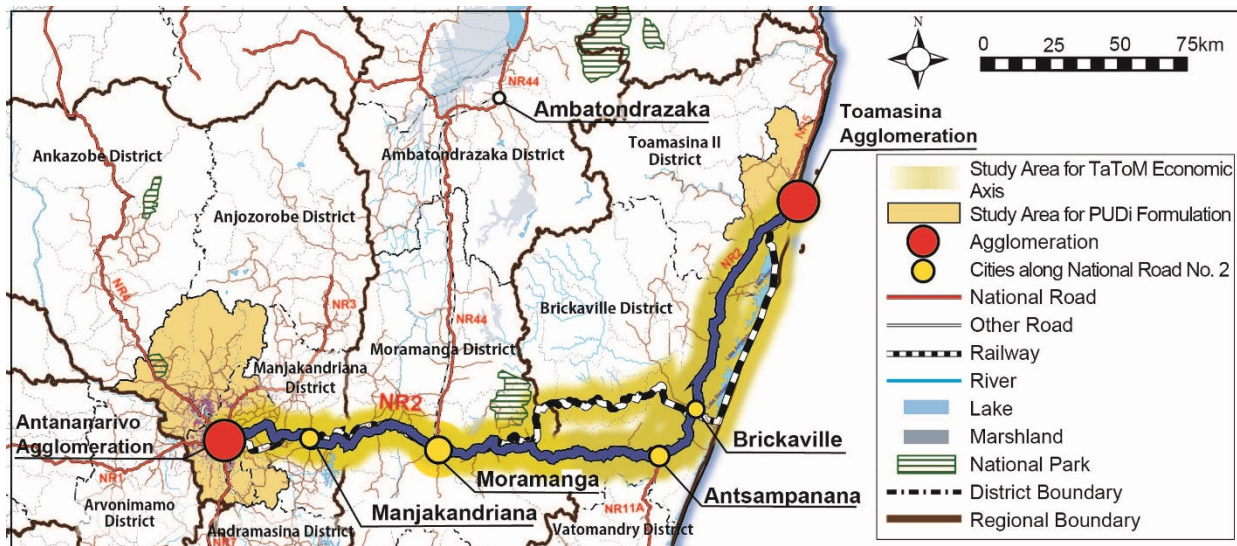
Source: JICA Study Team

Figure 1.3.1 Study Area for Antananarivo Agglomeration (Antananarivo Sub-Region)



Source: JICA Study Team

Figure 1.3.2 Study Area for Toamasina Agglomeration (Toamasina Sub-Region)



Source: JICA Study Team

Figure 1.3.3 Study Area for Antananarivo - Toamasina Economic Axis

### 1.3.2 Planning Areas for the Project

The planning areas for the two PUDis are as follows:

- The planning area for Antananarivo Agglomeration comprises the following two areas.
  - The area to develop a land use plan, an urban infrastructure plan, and an urban transportation improvement plan at a scale of 1:10,000 is the urban and urbanising areas within CUA and its surrounding peripheral communes by the target year 2033.
  - The area to formulate a spatial development framework at a scale of 1:50,000 is outside of the urban and urbanising areas in the study area
- The planning area for Toamasina Agglomeration to develop a land use plan, an urban infrastructure plan, and an urban transportation improvement plan at a scale of 1:10,000 is the urban and urbanising areas within CUT and its surrounding peripheral communes by the target year 2033.

## 1.4 Project Organisation

### 1.4.1 Project Management Structure

In order to carry out TaToM Project effectively and efficiently, the National Steering Committee (NSC) and three Local Steering Committees (LSCs) were organised in the Malagasy counterpart side. The roles of the NSC and the three LSCs for respective three project components are shown in Table 1.4.1.

**Table 1.4.1 Project Management Structure (National Steering Committee and Three Local Steering Committees)**

Project Management Structure	Roles and Timing
National Steering Committee (NSC)	<ul style="list-style-type: none"> <li>To discuss and define main items of the Project to guide the Project, and take necessary actions required for smooth implementation of the Project.</li> <li>To hold a meeting as every main report of the Project becomes ready to discuss</li> </ul>
Local Steering Committee (LSC) for Antananarivo Agglomeration	<ul style="list-style-type: none"> <li>To discuss technical aspects of the Project properly and provide the necessary data and information for the Project.</li> <li>To hold a meeting as every main report of the Project becomes ready to discuss although the topic and the timing will be set based on necessity.</li> </ul>
Local Steering Committee (LSC) for Toamasina Agglomeration	<ul style="list-style-type: none"> <li>To discuss technical aspects of the Project properly and provide the necessary data and information for the Project.</li> <li>To hold a meeting as every main report of the Project becomes ready to discuss although the topic and the timings will be set based on necessity.</li> </ul>
Local Steering Committee (LSC) for TaToM Economic Axis	<ul style="list-style-type: none"> <li>To discuss technical aspects of the Project properly and provide the necessary data and information for the Project.</li> <li>To hold a meeting as every main report of the Project becomes ready to discuss although the topic and the timing will be set based on necessity.</li> </ul>

Source: NOTE MINISTERIELLE N°56/2016-M2PATE/SG/DGATE/DVPT; MINISTERIELLE NOTE N° 564/2016-M2PATE/SG/DGATE/DVPT.

The members of these committees are fixed by the Ministerial Notes issued by M2PATE in 2016. These Ministerial Notes were revised in April 2017. In January 2019, a new government was established in Madagascar and the government ministries were reorganized. The members of the NSC and the three LSCs for the respective three project components are shown in Table 1.4.2, Table 1.4.3, Table 1.4.4 and Table 1.4.5.

**Table 1.4.2 Members of National Steering Committee**

Position	Members Listed in the Ministerial Note	Members under the Present Government
President	Secretary-General of M2PATE	Secretary-General of MAHTP
Members	Director General of Land Development and Equipment (DGATE/M2PATE) Secretary-General of Interior and Decentralization Secretary-General of Public Works Secretary-General of Transport and Meteorology Secretary-General of Tourism Secretary-General of Industry and Private Sector Development Secretary-General of Economy and plan Secretary-General of Environment, Ecology and Forest Secretary-General of Water, Sanitation and Hygiene Secretary-General of National Education Secretary-General of Public Health Secretary-General of Energy and Hydrocarbon Director-General of Toamasina Autonomous Port Authority (SPAT) Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Chief of Region of Analamanga Chief of Region of Atsinanana Chief of Region of Alaotra-Mangoro The Members of the Office of Urban Planning Group of Grand Antananarivo, as Vice-President of Local Steering Committee of Antananarivo The Members of the Office of Urban Planning Group of Grand Toamasina, as Vice-President of Local Steering Committee of	Director General of Spatial Planning and Housing (DGATH/MAHTP) Secretary-General of Interior and Decentralization Secretary-General of Transport, Tourism and Meteorology Secretary-General of Industry, Trade and Handicrafts Secretary-General of Economy and Finance Secretary-General of Environment and Sustainable Development Secretary-General of Energy, Water and Hydrocarbons Secretary-General of National Education and Technical and Professional Education Secretary-General of Public Health Director-General of Toamasina Autonomous Port Authority (SPAT) Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Chief of Region of Analamanga Chief of Region of Atsinanana Chief of Region of Alaotra-Mangoro The Members of the Office of Urban Planning Group of Grand Antananarivo, as Vice-President of Local Steering Committee of Antananarivo The Members of the Office of Urban Planning Group of Grand Toamasina, as Vice-President of Local Steering Committee of Toamasina

	Toamasina Director-General of Land Transport, as a Vice-President of Local Steering Committee of TaToM Economic Axis Director-General of Public Works, as a Vice-President of Local Steering Committee of TaToM Economic Axis	Director-General of Land Transport, as a Vice-President of Local Steering Committee of TaToM Economic Axis Director General of Public Works (DGTP/ MAHTP) as a Vice-President of Local Steering Committee of TaToM Economic Axis
Technical Partner	JICA Madagascar JICA Study Team	JICA Madagascar JICA Study Team

Source: NOTE MINISTERIELLE N°057/2017-M2PATE/SG/DGATE/DVPT

**Table 1.4.3 Members of Local Steering Committee for PUDi Antananarivo Agglomeration**

Position	Members Listed in the Ministerial Note	Members under the Present Government
President	Director General of Land Development and Equipment (DGATE/M2PATE)	Director General of Spatial Planning and Housing (DGATH/MAHTP)
Vice-President	President of Urban Planning Group of Antananarivo Agglomeration	President of Urban Planning Group of Antananarivo Agglomeration
Members	Director-General of Land Services (M2PATE) Director-General of Infrastructures and Presidential Projects (M2PATE) Director-General of Public Works (MTP) Director-General of Land Transport (MTM) Director-General of Decentralization (MID) Director-General in Ministry of Public Health Director-General of Fundamental Education and Alphabetization Director-General of Industrial Development Director-General of Energy Director-General of Environment Director-General of National Environment Office Technical Director-General in Ministry of Water, Sanitation and Hygiene Director-General of Local Development Fond Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Executive-Secretary of Unit of prevention and urgencies management (CPGU) Director-General of Road Authority of Madagascar (ARM) Director-General of Agency of Land Transport Agency (ATT) Director-General of Flood Protection Authority of the Antananarivo Plain (APIPA) Director-General of Autonomous Maintenance Service of the City of Antananarivo (SAMVA) Chief of Analamanga Region Inter-Regional Director of M2PATE in Analamanga Chief of Regional Service of Land Use in Analamanga Chief of Regional Service of Domain in Analamanga Chief of Regional Service of Topography in Analamanga Members of Urban Planning Group of Antananarivo President of Chamber of Commerce President of GEM (Enterprise Group of Madagascar) President of SIM (Industrial Syndicate of Madagascar) President of FIVMPAMA (Group of Malagasy Employers) Director-General of Economic Development Board of Madagascar (EDBM) Representatives of civil society Members of Urban Sector Group of Partners President of the Architects' Association	Director-General of Land Services (MAHTP) Director-General of Infrastructures and Presidential Projects (MAHTP) Director-General of Public Works (MAHTP) Director-General of Land Transport (MTM) Director-General of Ministry of Public Health Director-General of Education (MENETP) Director-General of Industry (MICA) Director-General of Energy (MEEH) Director-General of Environment (MEDD) Director-General of National Environment Office Technical Director-General in Ministry of Energy, Water and Hydrocarbons Director-General of Local Development Fond Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Executive-Secretary of Unit of prevention and urgencies management (CPGU) Director-General of Road Authority of Madagascar (ARM) Director-General of Agency of Land Transport Agency (ATT) Director-General of Flood Protection Authority of the Antananarivo Plain (APIPA) Director-General of Autonomous Maintenance Service of the City of Antananarivo (SAMVA) Chief of Analamanga Region Inter-Regional Director of MAHTP in Analamanga Chief of Regional Service of Land Use in Analamanga Chief of Regional Service of Domain in Analamanga Chief of Regional Service of Topography in Analamanga Members of Urban Planning Group of Antananarivo President of Chamber of Commerce President of GEM (Enterprise Group of Madagascar) President of SIM (Industrial Syndicate of Madagascar) President of FIVMPAMA (Group of Malagasy Employers) Director-General of Economic Development Board of Madagascar (EDBM) Representatives of civil society Members of Urban Sector Group of Partners President of the Architects' Association
Technical Partner	JICA Madagascar JICA Study Team	JICA Madagascar JICA Study Team

Source: MINISTERIELLE NOTE N° 057 /2017-M2PATE/SG/DGATE/DVPT

**Table 1.4.4 Members of Local Steering Committee for PUDi Toamasina Agglomeration**

Position	Members Listed in Ministerial Note	Members under Present Government
President	Director General of Land Development and Equipment (DGATE/M2PATE)	Director General of Spatial Planning and Housing (DGATH/MAHTP)
Vice-President	President of Urban Planning Group of Grand Toamasina	President of Urban Planning Group of Grand Toamasina
Members	Inter-Regional Director of M2PATE Inter-Regional Director of MTP at Toamasina, as a member Inter-Regional Director of MTM at Toamasina Inter-Regional Director of Ministry of Tourism at Toamasina Inter-Regional Director of Ministry of Industry and Private Sector Development at Toamasina Inter-Regional Director of Ministry of Economy and Planning at Toamasina Inter-Regional Director of Ministry of Environment, Ecology and Forest Inter-Regional Director of Ministry of Water, Sanitation and Hygiene at Toamasina Inter-Regional Director of Ministry of National Education at Toamasina Inter-Regional Director of Ministry of Energy and Hydrocarbon at Toamasina Director-General of Local Development Fond Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Chief of Atsinanana Region Chief of Regional Service of Land Use in Atsinanana Chief of Regional Service of Domain in Atsinanana Chief of Regional Service of Topography in Atsinanana Members of Urban Planning Group of Toamasina Director-General of Toamasina Autonomous Port Authority (SPAT) Director-General of Road Authority of Madagascar (ARM) Director-General of Agency of Land Transport Agency (ATT) President of Chamber of Commerce President of GEM (Enterprise Group of Madagascar) President of SIM (Industrial Syndicate of Madagascar) President of FIVMPAMA (Group of Malagasy Employers) Director-General of Economic Development Board of Madagascar (EDBM) Representatives of civil society Members of Urban Sector Group of Partners President of the Architects' Association	Inter-Regional Director of MAHTP Inter-Regional Director of MTTM at Toamasina Inter-Regional Director of Ministry of Industry, Trade and Handicrafts at Toamasina Inter-Regional Director of Ministry of Economy and Finance at Toamasina Inter-Regional Director of Ministry of Environment and Sustainable Development at Toamasina Inter-Regional Director of Ministry of Energy, Water and Hydrocarbons at Toamasina Inter-Regional Director of Ministry of National Education and Technical and Professional Education at Toamasina Director-General of Local Development Fond Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Chief of Atsinanana Region Chief of Regional Service of Land Use in Atsinanana Chief of Regional Service of Domain in Atsinanana Chief of Regional Service of Topography in Atsinanana Members of Urban Planning Group of Toamasina Director-General of Toamasina Autonomous Port Authority (SPAT) Director-General of Road Authority of Madagascar (ARM) Director-General of Agency of Land Transport Agency (ATT) President of Chamber of Commerce President of GEM (Enterprise Group of Madagascar) President of SIM (Industrial Syndicate of Madagascar) President of FIVMPAMA (Group of Malagasy Employers) Director-General of Economic Development Board of Madagascar (EDBM) Representatives of civil society Members of Urban Sector Group of Partners President of the Architects' Association
Technical Partner	JICA Madagascar JICA Study Team	JICA Madagascar JICA Study Team

Source: MINISTERIELLE NOTE N° 057 /2017-M2PATE/SG/DGATE/DVPT

**Table 1.4.5 Members of Local Steering Committee for Transport and Territorial Development Plan**

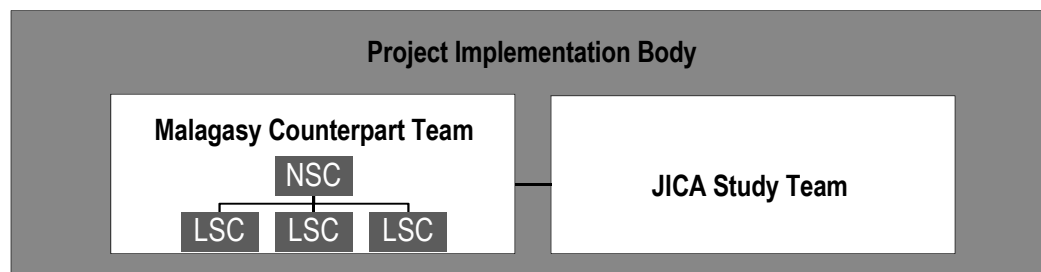
Position	Members Listed in the Ministerial Note	Members under the Present Government
President	Director General of Land Development and Equipment (DGATE/M2PATE)	Director General of Spatial Planning and Housing (DGATH/MAHTP)
Vice-President	Director-General of Land Transport (MTM) Director-General of Public Works (MTP)	Director-General of Land Transport (MTTM) Director General of Public Works (DGTP/ MAHTP)
Members	Director-General of Decentralization (MID) Director-General of Environment Director-General of National Environment Office Director-General of Local Development Fond Chief of Analamanga Region	Director-General of Decentralization (MID) Director-General of Environment Director-General of National Environment Office Director-General of Local Development Fond Chief of Analamanga Region

Position	Members Listed in the Ministerial Note	Members under the Present Government
	Chief of Atsinanana Region Chief of Alaotra-Mangoro Region Inter-Regional Director of M2PATE in Analamanga Inter-Regional Director of M2PATE in Atsinanana Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Director-General of Road Authority of Madagascar (ARM) Director-General of Agency of Land Transport Agency (ATT) Mayor of Manjakandriana Urban Commune Mayor of Moramanga Urban Commune Mayor of Brickaville Urban Commune Chief of Regional Service of Land Use in Analamanga Chief of Regional Service of Domain in Analamanga Chief of Regional Service of Topography in Analamanga Chief of Regional Service of Land Use in Atsinanana Chief of Regional Service of Domain in Atsinanana Chief of Regional Service of Topography in Atsinanana, as a member Chief of Regional Service of Land Use in Alaotra-Mangoro Chief of Regional Service of Domain in Alaotra-Mangoro Chief of Regional Service of Topography in Alaotra-Mangoro Members of Urban Planning Group of Antananarivo Members of Urban Planning Group of Toamasina President of Chamber of Commerce President of GEM (Enterprise Group of Madagascar) President of SIM (Industrial Syndicate of Madagascar) President of FIVMPAMA (Group of Malagasy Employers) Director-General of Economic Development Board of Madagascar (EDBM) Representatives of civil society Members of Urban Sector Group of Partners President of the Architects' Association	Chief of Atsinanana Region Chief of Alaotra-Mangoro Region Inter-Regional Director of MAHTP in Analamanga Inter-Regional Director of MAHTP in Atsinanana Executive-Secretary of National Office of Disaster Risk Management (BNGRC) Director-General of Road Authority of Madagascar (ARM) Director-General of Agency of Land Transport Agency (ATT) Mayor of Manjakandriana Urban Commune Mayor of Moramanga Urban Commune Mayor of Brickaville Urban Commune Chief of Regional Service of Land Use in Analamanga Chief of Regional Service of Domain in Analamanga Chief of Regional Service of Topography in Analamanga Chief of Regional Service of Land Use in Atsinanana Chief of Regional Service of Domain in Atsinanana Chief of Regional Service of Topography in Atsinanana, as a member Chief of Regional Service of Land Use in Alaotra-Mangoro Chief of Regional Service of Domain in Alaotra-Mangoro Chief of Regional Service of Topography in Alaotra-Mangoro Members of Urban Planning Group of Antananarivo Members of Urban Planning Group of Toamasina President of Chamber of Commerce President of GEM (Enterprise Group of Madagascar) President of SIM (Industrial Syndicate of Madagascar) President of FIVMPAMA (Group of Malagasy Employers) Director-General of Economic Development Board of Madagascar (EDBM) Representatives of civil society Members of Urban Sector Group of Partners President of the Architects' Association
Technical Partner	JICA Madagascar JICA Study Team	JICA Madagascar JICA Study Team

Source: MINISTERIELLE NOTE N° 057 /2017-M2PATE/SG/DGATE/DVPT

### 1.4.2 Project Implementation Body

The Project is carried out by the JICA Study Team in close collaboration with the Malagasy counterpart agencies and counterpart personnel. The Malagasy counterparts and the JICA Study Team compose the Project Implementing Body as shown in Figure 1.4.1.



Source: JICA Study Team

Figure 1.4.1 Project Implementing Body consisting of Malagasy Counterparts and JICA Study Team



## 1.5 Organisation of the Final Report

The Final Report reflected the views and opinions expressed by participants at Local Steering Committee Meetings, National Steering Committee Meetings and other meetings with the JICA Study Team.

The Final Report is composed of the following volumes:

- Summary
- Main Text Volume 1
- Main Text Volume 2

The Summary of the Final Report has 21 chapters which are organised as follows:

- Chapter 1: Introduction
- Chapters 2 -3: National Development and Overall TaToM Area Development
- Chapters 4-8: Revised PUDi for Antananarivo Agglomeration
- Chapters 9-13: Revised PUDi for Toamasina Agglomeration
- Chapter 14: Common Land Use Zoning Regulation for Madagascar
- Chapters 15-19: Transport and Territorial Development Plan for TaToM Economic Axis
- Chapter 20: Implementation Framework for TaToM
- Chapter 21: Conclusions and Recommendations

The Main Text of the Final Report is organised into the following seven parts and appendix:

- Part I: Introduction
- Part II: National Development and Overall TaToM Area Development
- Part III: Revised PUDi for Antananarivo Agglomeration
- Part IV: Revised PUDi for Toamasina Agglomeration
- Part V: Transport and Territorial Development Plan for TaToM Economic Axis
- Part VI: Implementation Framework for TaToM
- Part VII: Strategic Environmental Assessment (SEA)
- Appendix

The PUDi for each agglomeration is composed of the following aspects:

- Urban Development Strategies and Priority Projects,
- Land Use Policy and Land Use Zoning Regulations,
- Strategies for Development of Economic Sectors and Priority Projects,
- Strategies for Disaster Risk Reduction and Management and Priority Projects,
- Strategies for Road and Transport Development and Priority Projects, and
- Strategies for Development of Infrastructure Sectors and Priority Projects.

## PART II

# NATIONAL DEVELOPMENT AND OVERALL TATOM AREA DEVELOPMENT



## Chapter 2 Madagascar: Future Vision for National Development

### 2.1 National Future Vision for Madagascar

The manifesto of the newly elected president, the former administration's National Development Plan (PND: *Plan national de développement*) 2015-2019 and Madagascar's Vision 2030 have similar directions towards national development.

National Future Vision for Madagascar can be summarised as follows:

“Madagascar will recover and emerge to be a Modern and Prosperous Country with Middle-Income Status by efficient and sustainable utilisation of its national territory, as well as of natural and human resources, by promoting economic sectors development oriented to export markets, as well as to domestic markets, and by attracting investments for enhancing the productivity of economic sectors.”

#### 2.1.1 Manifesto of the Newly Elected President

Mr. Andry Rajoelina, the new president of the Republic of Madagascar elected through the election held in November and December 2018, used a manifesto in his political campaign. The manifesto was a kind of strategic programme for the nation prepared by consideration, research and discussion with a variety of Malagasy people.

The manifesto proposes a development programme for realising the emergence of Madagascar, called the Programme for Initiative of Emergence of Madagascar (or “IEM Programme”). The IEM Programme is based on the following six priority areas:

- Agribusiness consisting of agricultural production and agro-processing by establishing Industrial Investment Promotion Zones
- Mining not only of existing mineral resources but also of hydrocarbon resources
- Tourism by establishing Tourism Investment Promotion Zones
- Industrial development for transforming “commercial economy” to “value-creating economy” targeting local and international markets
- Technology utilisation in all fields including business, education, health, government administration and ICT
- Blue economy including sustainable growth of aquaculture, coastal tourism, marine biotechnology, marine energy and deep seabed mining resources

#### 2.1.2 National Development Plan (PND) 2015 - 2019

The National Development Plan (PND) 2015 – 2019 upholds the national vision of “**a modern and prosperous nation**.” The ultimate goal of the PND is to achieve sustained and shared economic growth allowing the Malagasy society to be resilient to additional shocks by using these different types of natural, human and productive capital in an inclusive, integrated and sustainable way.

## 2.1.3 Vision 2030 of Madagascar

### (1) Targets of Vision 2030

Based on the PND, a long-term development plan, “Fisandratana 2030: the Growth and Transformation Plan – Development Vision of Madagascar Toward the 2030 Horizon”<sup>1</sup> was proposed in January 2018. This plan envisions the ambition of becoming **a middle-income country in 2030**, breaking the vicious cycle of the Malagasy paradox, which is the country’s underdevelopment despite being rich in natural resources, due to periodic political crises.

The targets to be achieved under the Vision 2030 include:

- To increase GDP per capita from US\$416 in 2016 to US\$ 1,000 in 2030
- To reduce the poverty rate from 78% in 2016 to less than 25% in 2030
- To raise the ranking of the Human Development Index (HDI) from 158th in 2015 to 70 to 80th in 2033

The Vision 2030 comprehensively covers the key themes concerned with long-term development of Madagascar, including economy, human resources, infrastructure and urban development, entrepreneurship and private sector development, and effective government.

### (2) Driving Forces of Development

As the Malagasy economy in 2030 when the above targets are achieved, six images are contemplated in the Vision 2030. Seven economic sectors are identified as driving forces of the economic growth of the country, with quantitative indicators to be achieved by 2030 for each of them. The brief six economic visions are presented below and the development direction of seven sectors are presented in Table 2.1.1.

- Madagascar will be the attic (food storage) of the Indian Ocean.
- Madagascar will be a dynamic industrial basin, a "Shenzhen" of Africa.
- Madagascar will be a champion of the blue economy.
- Madagascar will offer the world rare products from its biodiversity.
- Madagascar will become a major player in the global mining and gemstone market.
- Madagascar will be one of the most famous and most popular tourist destinations in the world.

**Table 2.1.1 Development Direction of Seven Economic Sectors**

Economic Sector		Development Directions
1	Food and livestock farming (corn, sugar, fruits and vegetables)	<ul style="list-style-type: none"> <li>• To ensure food security and export rice, maize, fish, fruits and vegetables or meat throughout the Indian Ocean and beyond by realizing "agricultural revolution" and agro-industrial, to significantly improve farmers' incomes and reduce poverty.</li> <li>• By 2030, its value added will be multiplied by 5 to reach 30% of GDP and generate about one million five hundred thousand jobs.</li> <li>• Rice: To ensure its self-sufficiency (12.9 million tonnes) and to cover all the needs of the Indian Ocean, by quadrupling its current production of paddy in 2030.</li> <li>• Corn: To meeting the needs of the agro-food and feed industries by increasing production by 4.7 times.</li> <li>• Sugar: To double sugar production by 1.57 times in order to cover all the needs of Madagascar and the Indian Ocean</li> <li>• Fruits and Vegetable: To increase its fruit and vegetable production by 1.5 by 2030 to meet national and regional demand.</li> <li>• Beef: To increase beef production by nearly 1.3 by 2030 to meet national and regional demand.</li> </ul>
2	Industry (textile, agro-industry, leathers and shoes, etc.)	<ul style="list-style-type: none"> <li>• To build a dynamic light industry by 2030, competitive in international markets and creating one million jobs. By multiplying its value added by 10, the sector's contribution to GDP will increase from 4% today to 10% in 2030.</li> <li>• To develop the framework of private public partnerships of integrated industrial parks, dedicated to agribusiness, the textile industry, leather and assembly industries, with sufficient energy supply and backed by competitive ports, and a trained workforce.</li> <li>• To prepare real sectoral policies to structure and integrate these sectors, favoring harmonious networking between local and foreign firms.</li> <li>• To build the local value chain of textile industry from the production of seed cotton to the export of clothing products.</li> </ul>

<sup>1</sup> Fisandratana means "emergence and rebirth" in Malagasy.

Economic Sector		Development Directions
		<ul style="list-style-type: none"> <li>To set up vocational training programs in partnership with private actors to promote the professional integration of Malagasy youth for all sectors.</li> </ul>
3	Fishing and aquaculture	<ul style="list-style-type: none"> <li>To significantly increase by 2030 the revenues of its Fisheries &amp; Aquaculture sector and its presence in major export markets.</li> <li>To increase the contribution of the sector from 5% of the GDP to 8% and create 350,000 new formal jobs</li> <li>Six key policies: <ol style="list-style-type: none"> <li>1) Better knowledge and preservation of Madagascar's fishery resources;</li> <li>2) Support and reinforcement of traditional fishermen</li> <li>3) Fight against illegal fishing</li> <li>4) Renegotiation of multilateral and bilateral agreements, notably with the European Union, China and Japan, and the introduction of an export tax for international vessels operating in the Malagasy Exclusive Economic Zone.</li> <li>5) Strengthening the regulatory framework for the sector,</li> <li>6) Promoting investments in the sector, with the facilitation of investments in industrial fishing and local processing, training fish farmers to increase their productivity, reinforcement of training in fishing professions, and the facilitation of access to markets through the respect of quality and hygiene standards.</li> </ol> </li> </ul>
4	Rare agricultural and forest products (vanilla, clove, cocoa, pepper, lychee, ginger, turmeric and cinnamon, and aromatic and medical plants)	<ul style="list-style-type: none"> <li>To preserve and enhance natural heritage of the world rare products from its biodiversity in aromatherapy, cosmetics or pharmacopoeia, by structuring value chain and inserting them into global value changes, strengthening the quality of products, and setting up a BIO Madagascar foundation for the sustainable management of this formidable natural heritage.</li> <li>To be world market a dozen rare, preserved and traceable "treasures" leaders in their market, beyond vanilla and clove and reinforce the "Madagascar Treasury Island" brand.</li> <li>To increase from 3% contribution to GDP today to 5% in 2030. Its added value will be multiplied by 6 and approximately 300,000 jobs will be created</li> <li>Vanilla and clove: To sustainably maintain Madagascar's leadership position in global vanilla and clove markets (Vanilla: 80% share, clove: increase production by 3.6 times and double its share in world exports.)</li> </ul>
5	Extractive industries (industrial mines and hydrocarbons)	<ul style="list-style-type: none"> <li>To capitalize as much as possible on the ripple effect of a diversified extractive industries sector, particularly on national spatial planning and the increase in tax revenues.</li> <li>In 2030, it will represent 8% of GDP against 2% today. The sector will see its added value multiplied by 18 and 400,000 jobs will be generated.</li> <li>To fully exploit its potential in the extractive industries, with maximum local added value, and this within the framework of a strict policy of environmental preservation and sustainable development.</li> <li>To develop a mining code and a petroleum code</li> <li>To establish a Madagascar Mining Company (SMM) and a Hydrocarbons Company of Madagascar (SHM) to optimizing the spin-offs for Madagascar in the management of projects, and mining and hydrocarbon assets.</li> </ul>
6	Precious stones	<ul style="list-style-type: none"> <li>To become, by 2030, a significant player in the global gemstone market, at the height of its true potential.</li> <li>To increase the share in GDP from less than 1% to 2% of GDP in 2030, while creating 350,000 jobs.</li> <li>To develop a national competitiveness strategy for the sector will be put in place with all of its stakeholders for a restructured, better-managed Malagasy precious stone industry that ensures greater local transformation would significantly contribute to the national creation of wealth and employment, and to the international influence of Madagascar.</li> <li>Three axes as foundation for the new sectoral policy <ol style="list-style-type: none"> <li>1) A better structure and organization of the entire sector: a) the clarification of the legal base for the exploitation of mining companies or individual miners, b) access to resources; c) the simplification of authorization processes; d) strengthening the capacities of actors in the sector, in multiple fields</li> <li>2) Development of a clear, attractive and stable fiscal framework</li> <li>3) Development of a marketing policy for precious stones, based on the promotion of a "Madagascar" label: a) the development of a niche market for Malagasy colored stones, with a reliable and complete traceability system, b) extension of the single window of mines to all segments of the value chain to facilitate transactions, certification, etc., and c) the establishment of a great fair of Malagasy gemstones</li> </ol> </li> </ul>
7	Tourism	<ul style="list-style-type: none"> <li>To make Madagascar one of the best-known and most popular tourist destinations in the world.</li> <li>To create 500,000 jobs in tourism, and to reach 10% contribution to GDP, against 5% today by multiplying the value added by 8 times</li> <li>To develop a detailed sectoral plan and precise strategy for the main tourism segments (Ecotourism, Romance / Seaside, MICE25, IBT26, VFF27) with the specific objectives and the approach.</li> <li>To focus on certain essential prerequisites for the development of the sector, including greater socio-political and security stability, the development of access infrastructures (roads, airports), the development of Areas of Interest Tourist and more legislation adapted to the new ambition.</li> <li>To implement the framed development of Zones of Tourist Interest (ZIT) (in particular, the northern part of the country from Diego Suarez to Nosy Be, the west coast from Morondava to Tulear, the bay of Fort Dauphin, the NR 7, and Île Sainte-Marie to the East.)</li> <li>To develop better legislation for regulation of tourism activities</li> <li>To enhance visitor services with the development of hotel services and catering, the development of international partnerships and a favorable business environment for investment, the development of a diverse catalog of tours and activities for visitors, and a greater enhancement of local crafts, the enhancement of retail experiences</li> </ul>

Source: Fisandratana 2030, Une Vision Pour L'Émergence et la Renaissance de Madagascar

## 2.2 National Development Trend of Madagascar

### 2.2.1 Population of Madagascar

It is estimated that Madagascar has increased its population rapidly in the past decades at an average annual growth rate of over 2.7% between 1966 and 2018 as shown in Table 2.2.1.

Although the population and housing census in Madagascar was conducted in 2018, the official result is not yet released. Since the last existing official data of population and housing census of Madagascar is from census survey conducted over 20 years ago, it is difficult to know the accurate current population of Madagascar. However, according to the census provisional result the current population of Madagascar is around 25.7 million.

The population of Madagascar has become more than four times larger in the last half century from 6.2 million to 25.7 million.

Table 2.2.1 Trend of Population in Madagascar, 1966-2018

	1966 <sup>1</sup> (Demographic Survey)	1975 <sup>2</sup> (Census)	1993 <sup>3</sup> (Census)	2018 <sup>4</sup> (Census Provision Result)	Average Annual Growth Rate 1966-1993	Average Annual Growth Rate 1966-2018
Population of Madagascar	6,200,000	7,585,808	12,238,914	25,734,342	2.55%	2.77%
Annual Growth Rate	-	2.27%	2.69%	3.02%		

Source 1: Institut national de la statistique et de la recherche économique, 1967, Enquête Démographique de 1966

Source 2: Institut national de la statistique et de la recherche économique, Recensement General de la Population et des Habitats 1975

Source 3: Direction Generale de l'Institut National de la Statistique, Recensement General de la Population et de l'Habitats 1993

Source 4: INSTAT, 2019, Troisieme Recensement General de la Population et de l'Habitation (RGPH-3) Resultats Provisoires

### 2.2.2 National Economy

#### (1) National GDP of Madagascar

##### 1) National GDP and GDP per Capita of Madagascar

In 2015, Madagascar had a GDP of US\$ 9.7 billion at current prices. The trend patterns of GDP and GDP per capita in Madagascar are shown in Table 2.2.2. These are characterised by the sudden drops in 2009, which have been heavily influenced by Madagascar's political crisis in 2009 and Global Financial Crisis in 2008. Madagascar's economic growth rates collapsed from above 6% in 2006-2008 to an average of 1.3% in 2009-2015. While GDP in US dollars sharply declined due to political instability in 2009, it has recovered gradually since 2012.

Table 2.2.2 GDP and GDP per Capita of Madagascar

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
GDP (Current, US\$ Million)	5,515.9	7,342.9	9,413.0	8,550.4	8,729.9	9,892.7	9,919.8	10,601.7	10,673.5	9,738.7
GDP (Current, Ariary Billion)	11,816.7	13,759.7	16,080.9	16,726.3	18,245.1	20,033.9	21,773.6	23,397.0	25,774.5	28,568.4
Real GDP Growth (Annual %)	5.0	6.2	7.1	-4.0	0.3	1.5	3.0	2.3	3.3	3.1
GDP per capita (Current, US\$)	293.0	379.1	472.4	417.2	414.1	456.3	445.0	462.5	452.8	401.8
GDP per capita (Current, Ariary Thousands)	627.7	710.3	807.0	816.1	865.5	924.1	976.7	1,020.6	1,093.5	1,178.8
Growth Rate of GDP per capital (Annual %)	2.0	3.3	4.1	-6.7	-2.5	-1.4	0.2	-0.6	0.5	0.2

Source: JICA Study Team based on World Development Indicator (World Bank, 2017)

According to the World Economic Outlook Database (IMF, October 2016), Madagascar is the 136th largest economy in the world. Furthermore, Madagascar is ranked 186th out of the 191

countries in GDP per capita, at current prices. In the Southern African Development Community (SADC), GDP ranges from lows of US\$1,359 million (Seychelles) to highs of US\$314,732 million (South Africa), and Madagascar is ranked 11th out of the 15 member countries.

## 2) National GDP Structure of Madagascar

The tertiary sector is predominant in the Malagasy economy, accounting for 55.8 percent of the national GDP in 2014, as shown in Table 2.2.3. Trade, transportation, and service activities dominate the tertiary sector in terms of GDP.

**Table 2.2.3 National GDP Composition by Sub-Sector (at 2007 constant prices)**

(Top: Billion Ariary, Bottom: %)

	2007	2008	2009	2010	2011	2012	2013	2014 (*)	2015 (*)	2016 (*)
<b>Primary Sector</b>	4,423.0 (28.8)	4,524.8 (27.8)	4,770.8 (30.3)	4,658.2 (29.6)	4,759.4 (29.7)	4,875.8 (29.4)	4,606.2 (27.4)	4,683.9 (27.0)	4,610.2 (25.9)	4,672.1 (25.4)
Agriculture	2,989.5 (19.5)	3,075.3 (18.9)	3,263.0 (20.8)	3,254.7 (20.7)	3,310.2 (20.7)	3,421.7 (20.6)	3,131.0 (18.6)	3,167.0 (18.2)	3,073.7 (17.3)	3,101.1 (16.9)
Livestock and Fishing	1,266.7 (8.3)	1,281.0 (7.9)	1,287.2 (8.2)	1,180.6 (7.5)	1,233.7 (7.7)	1,248.2 (7.5)	1,266.2 (7.5)	1,304.2 (7.5)	1,321.6 (7.4)	1,354.0 (7.4)
Forestry	166.8 (1.1)	168.5 (1.0)	220.7 (1.4)	222.9 (1.4)	215.5 (1.3)	205.8 (1.2)	208.9 (1.2)	212.8 (1.2)	214.9 (1.2)	217.0 (1.2)
<b>Secondary Sector</b>	2,022.7 (13.2)	2,138.7 (13.1)	2,002.3 (12.7)	2,038.7 (13.0)	2,111.3 (13.2)	2,294.2 (13.8)	2,784.9 (16.6)	2,966.7 (17.1)	3,194.5 (17.9)	3,292.0 (17.9)
Extractive industry	116.0 (0.8)	126.4 (0.8)	118.8 (0.8)	194.4 (1.2)	218.4 (1.4)	356.8 (2.2)	848.0 (5.0)	975.8 (5.6)	1,159.6 (6.5)	1,118.0 (6.1)
Food, drink, tobacco	763.7 (5.0)	803.0 (4.9)	789.0 (5.0)	797.7 (5.1)	819.0 (5.1)	840.4 (5.1)	825.0 (4.9)	846.5 (4.9)	864.3 (4.9)	902.9 (4.9)
Textile	345.7 (2.3)	343.0 (2.1)	314.4 (2.0)	282.8 (1.8)	285.9 (1.8)	288.9 (1.7)	304.9 (1.8)	309.7 (1.8)	299.7 (1.7)	340.3 (1.9)
Wood, paper, printing	174.9 (1.1)	168.2 (1.0)	170.5 (1.1)	184.1 (1.2)	177.9 (1.1)	179.5 (1.1)	184.7 (1.1)	188.8 (1.1)	197.3 (1.1)	212.1 (1.2)
Construction materials	56.4 (0.4)	63.3 (0.4)	59.0 (0.4)	60.9 (0.4)	63.3 (0.4)	65.0 (0.4)	61.1 (0.4)	63.1 (0.4)	64.7 (0.4)	68.1 (0.4)
Metal industry	156.7 (1.0)	219.5 (1.3)	172.6 (1.1)	143.8 (0.9)	165.7 (1.0)	168.6 (1.0)	149.2 (0.9)	153.7 (0.9)	164.9 (0.9)	175.4 (1.0)
Machine, electrical equipment	63.7 (0.4)	48.8 (0.3)	39.1 (0.2)	27.5 (0.2)	24.8 (0.2)	25.1 (0.2)	25.4 (0.2)	25.8 (0.1)	26.3 (0.1)	26.8 (0.1)
Various industries	187.5 (1.2)	197.5 (1.2)	171.0 (1.1)	167.9 (1.1)	170.5 (1.1)	172.8 (1.0)	172.6 (1.0)	175.9 (1.0)	181.9 (1.0)	195.8 (1.1)
Electricity, water, gas	158.1 (1.0)	169.0 (1.0)	167.9 (1.1)	179.8 (1.1)	185.7 (1.2)	197.1 (1.2)	214.1 (1.3)	227.4 (1.3)	235.8 (1.3)	252.6 (1.4)
<b>Tertiary Sector</b>	8,899.0 (58.0)	9,611.0 (59.1)	8,949.1 (56.9)	9,041.3 (57.4)	9,130.2 (57.1)	9,416.9 (56.8)	9,405.1 (56.0)	9,717.3 (55.9)	9,999.1 (56.2)	10,422.7 (56.7)
Public Work	1,285.2 (8.4)	1,663.6 (10.2)	1,370.4 (8.7)	1,412.1 (9.0)	1,460.3 (9.1)	1,511.7 (9.1)	1,482.8 (8.8)	1,529.9 (8.8)	1,677.4 (9.4)	1,778.6 (9.7)
Trade, maintenance, repairs	1,837.9 (12.0)	1,879.9 (11.6)	1,936.2 (12.3)	1,912.6 (12.2)	1,954.4 (12.2)	1,996.6 (12.0)	1,934.5 (11.5)	1,990.2 (11.5)	2,015.5 (11.3)	2,083.4 (11.3)
Hotel, Restaurant	334.6 (2.2)	364.2 (2.2)	178.0 (1.1)	195.5 (1.2)	212.0 (1.3)	239.9 (1.4)	231.5 (1.4)	251.8 (1.4)	258.4 (1.5)	294.3 (1.6)
Transportation	1,424.2 (9.3)	1,510.4 (9.3)	1,317.3 (8.4)	1,352.8 (8.6)	1,342.7 (8.4)	1,413.6 (8.5)	1,465.1 (8.7)	1,486.4 (8.6)	1,498.1 (8.4)	1,568.7 (8.5)
Post and telecommunication	249.0 (1.6)	265.0 (1.6)	296.8 (1.9)	335.6 (2.1)	351.5 (2.2)	371.9 (2.2)	405.3 (2.4)	412.5 (2.4)	394.2 (2.2)	430.8 (2.3)
Bank	326.7 (2.1)	356.0 (2.2)	420.4 (2.7)	405.2 (2.6)	429.8 (2.7)	446.5 (2.7)	465.2 (2.8)	528.4 (3.0)	627.6 (3.5)	677.8 (3.7)
Business services	1,233.4 (8.0)	1,307.1 (8.0)	1,245.6 (7.9)	1,281.9 (8.1)	1,323.3 (8.3)	1,367.1 (8.2)	1,406.9 (8.4)	1,427.7 (8.2)	1,466.4 (8.2)	1,520.9 (8.3)
Administration	1,211.0 (7.9)	1,336.6 (8.2)	1,294.5 (8.2)	1,254.0 (8.0)	1,216.4 (7.6)	1,193.4 (7.2)	1,172.5 (7.0)	1,185.0 (6.8)	1,162.3 (6.5)	1,149.5 (6.3)
Education	509.2 (3.3)	431.2 (2.6)	407.8 (2.6)	407.0 (2.6)	350.6 (2.2)	381.6 (2.3)	343.5 (2.0)	396.7 (2.3)	393.4 (2.2)	389.6 (2.1)
Health	247.5 (1.6)	253.2 (1.6)	231.9 (1.5)	226.9 (1.4)	224.0 (1.4)	222.5 (1.3)	217.7 (1.3)	220.3 (1.3)	219.3 (1.2)	223.8 (1.2)
Services provided to households	240.3 (1.6)	243.9 (1.5)	250.1 (1.6)	257.7 (1.6)	265.1 (1.7)	272.1 (1.6)	280.1 (1.7)	288.6 (1.7)	286.5 (1.6)	305.3 (1.7)
<b>Total</b>	15,344.7 (100.0)	16,274.5 (100.0)	15,722.2 (100.0)	15,738.2 (100.0)	16,000.9 (100.0)	16,586.9 (100.0)	16,796.2 (100.0)	17,367.9 (100.0)	17,803.8 (100.0)	18,386.8 (100.0)

Note: (\*) Provisional Version

Source: JICA Study Team based on National Statistics Institute (INSTAT) (June, 2018)

The primary sector accounts for 25.4 percent of the national GDP. Its share has gradually decreased since 2010. In the primary sector, agriculture is the most important contributor. Agriculture is one of the main livelihood sources for rural populations. Madagascar's climates are varied being tropical along the coasts, moderate in the highlands and arid in the south, enabling cultivation of a variety of crops.

The share of the second sector has slightly increased since 2010. In the secondary sector, the role of Export Processing Zone (EPZ), which are export-oriented industries including textile and apparel industry, is the most significant, followed by food industry, beverage industry, and energy. The EPZ, which was introduced in 1990, has helped Madagascar to move from a dependency on agricultural products, mainly vanilla and coffee, to a more diversified economy. Although the importance of mining sector is growing due to two recent large-scale mining operations (Rio Tinto's ilmenite mining operation in the south-eastern part of the country, and Ambatovy's nickel and cobalt mining in the eastern part of the country), the contribution to the national GDP is still small.

The recent economic growth is driven by the secondary sector and tertiary sector, as Table 2.2.4 indicates. As a whole, the primary sector recorded shrinkage. In the secondary sector, extractive industry (mining) is the most potential sector, while it depends largely on international market.

**Table 2.2.4 National GDP Growth by Sub-Sector of Origin (at constant prices)**

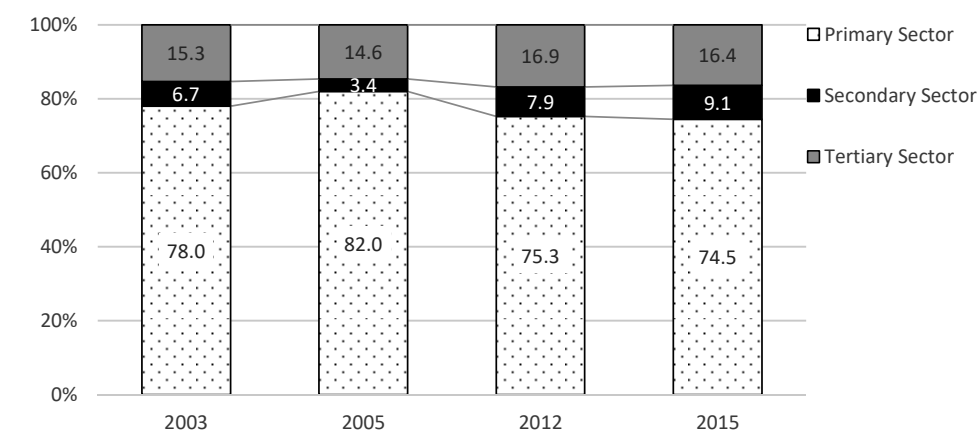
	2008	2009	2010	2011	2012	2013	2014 (*)	2015 (*)	2016 (*)
Agriculture	2.9%	6.1%	-0.3%	1.7%	3.4%	-8.5%	1.1%	-2.9%	0.9%
Livestock and Fishing	1.1%	0.5%	-8.3%	4.5%	1.2%	1.4%	3.0%	1.3%	2.5%
Forestry	1.0%	31.0%	1.0%	-3.3%	-4.5%	1.5%	1.8%	1.0%	1.0%
Extractive industry	9.0%	-6.0%	63.6%	12.4%	63.3%	137.7%	15.1%	18.8%	-3.6%
Food, drink, tobacco	5.2%	-1.8%	1.1%	2.7%	2.6%	-1.8%	2.6%	2.1%	4.5%
Textile	-0.8%	-8.4%	-10.1%	1.1%	1.0%	5.5%	1.6%	-3.2%	13.5%
Wood, paper, printing	-3.8%	1.4%	8.0%	-3.3%	0.9%	2.9%	2.2%	4.5%	7.5%
Construction materials	12.2%	-6.7%	3.2%	3.9%	2.7%	-6.1%	3.4%	2.5%	5.3%
Metal industry	40.1%	-21.4%	-16.7%	15.3%	1.8%	-11.5%	3.0%	7.3%	6.3%
Machine, electrical equipment	-23.4%	-19.8%	-29.8%	-9.8%	1.3%	1.5%	1.5%	1.8%	1.8%
Various industries	5.3%	-13.4%	-1.8%	1.5%	1.3%	-0.1%	1.9%	3.4%	7.7%
Electricity, water, gas	6.9%	-0.7%	7.1%	3.3%	6.2%	8.6%	6.2%	3.7%	7.1%
Public Works	29.4%	-17.6%	3.0%	3.4%	3.5%	-1.9%	3.2%	9.6%	6.0%
Trade, maintenance, repairs	2.3%	3.0%	-1.2%	2.2%	2.2%	-3.1%	2.9%	1.3%	3.4%
Hotel, Restaurant	8.9%	-51.1%	9.8%	8.5%	13.2%	-3.5%	8.8%	2.6%	13.9%
Transportation	6.1%	-12.8%	2.7%	-0.7%	5.3%	3.6%	1.4%	0.8%	4.7%
Post and telecommunication	6.4%	12.0%	13.1%	4.7%	5.8%	9.0%	1.8%	-4.4%	9.3%
Bank	9.0%	18.1%	-3.6%	6.1%	3.9%	4.2%	13.6%	18.8%	8.0%
Business services	6.0%	-4.7%	2.9%	3.2%	3.3%	2.9%	1.5%	2.7%	3.7%
Administration	10.4%	-3.1%	-3.1%	-3.0%	-1.9%	-1.7%	1.1%	-1.9%	-1.1%
Education	-15.3%	-5.4%	-0.2%	-13.9%	8.8%	-10.0%	15.5%	-0.8%	-1.0%
Health	2.3%	-8.4%	-2.2%	-1.3%	-0.7%	-2.1%	1.2%	-0.4%	2.0%
Services provided to households	1.5%	2.6%	3.0%	2.9%	2.6%	3.0%	3.0%	-0.7%	6.5%
Total	6.1%	-3.4%	0.1%	1.7%	3.7%	1.3%	3.4%	2.5%	3.3%

Note: (\*) Provisional Version

Source: JICA Study Team based on National Statistics Institute (INSTAT) (June, 2018)

## (2) Labour Force of Madagascar

In Madagascar, as Figure 2.2.1 indicates, the agricultural sector employed 74.5% of the workforce in 2015, even though its sector accounts for only 25.6% of GDP.

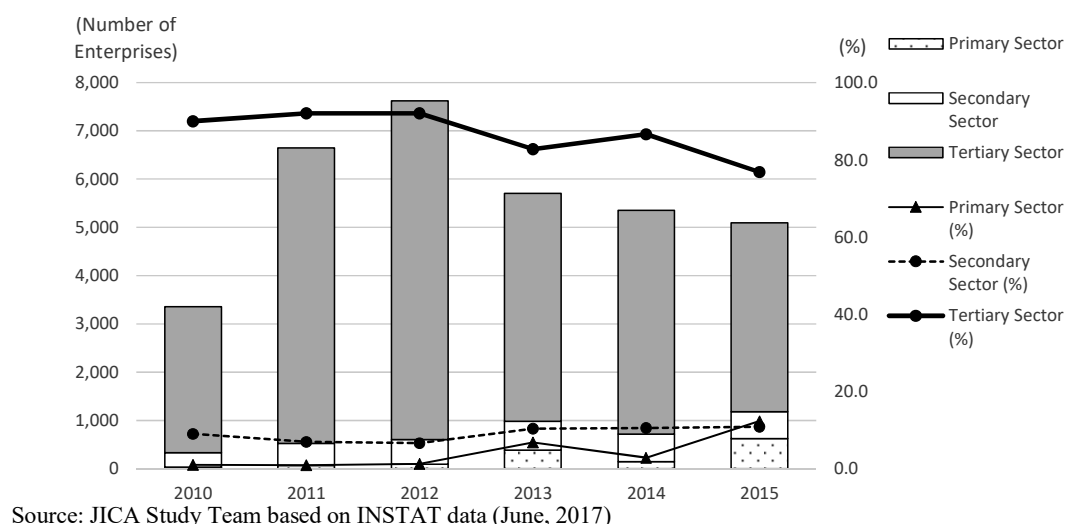


Source: JICA Study Team based on World Development Indicator (World Bank, 2017)

Figure 2.2.1 Employment by Sector (% of Employed)

### (3) Establishment of Enterprises in Madagascar

The number of new companies registered in Madagascar has increased sharply from 2010 to 2012, as shown in Figure 2.2.2, and then, decreased in the following years. New companies registered as the tertiary sector are substantial, though its proportion of newly registered companies has declined gradually. The companies of the tertiary sector are mainly retail, wholesale, logistics and Business Process Outsourcing (BPO), such as call centres.



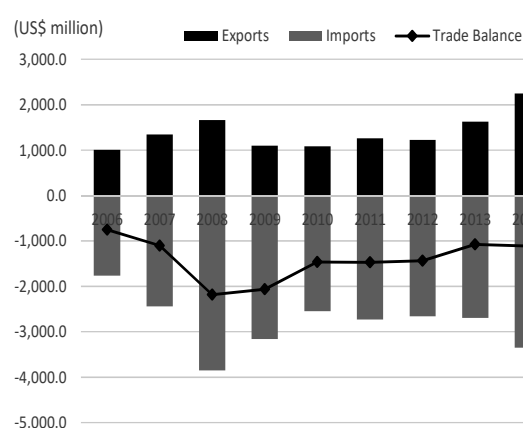
Source: JICA Study Team based on INSTAT data (June, 2017)

Figure 2.2.2 Number of Newly Registered Firms by Sector in Madagascar

### (4) External Trade of Madagascar

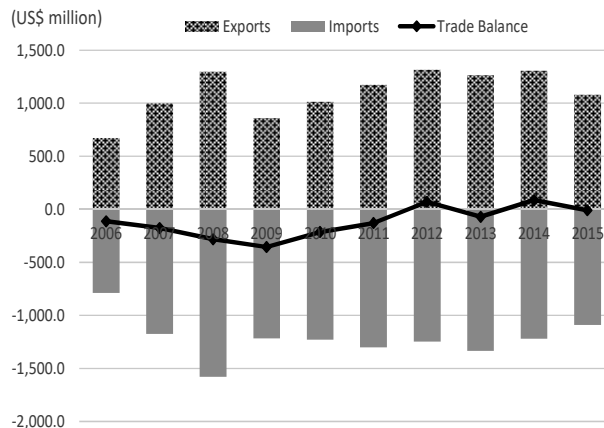
In 2015, as Figure 2.2.3 illustrates, the value of merchandise exports from Madagascar was US\$2,256 million, while its merchandise imports were US\$ 2,965 million. The merchandise trade balance recorded a moderate deficit of US\$ 796 million.

The value of export of services from Madagascar reached US\$ 1,079 million, while its service imports was US\$ 1,088 million, as Figure 2.2.4 shows. There is a relatively small trade in services deficit of US\$ 9 million.



Source: JICA Study Team based on International Trade Centre (ITC) Data (July, 2017)

Figure 2.2.3 Total Merchandise Trade by Value



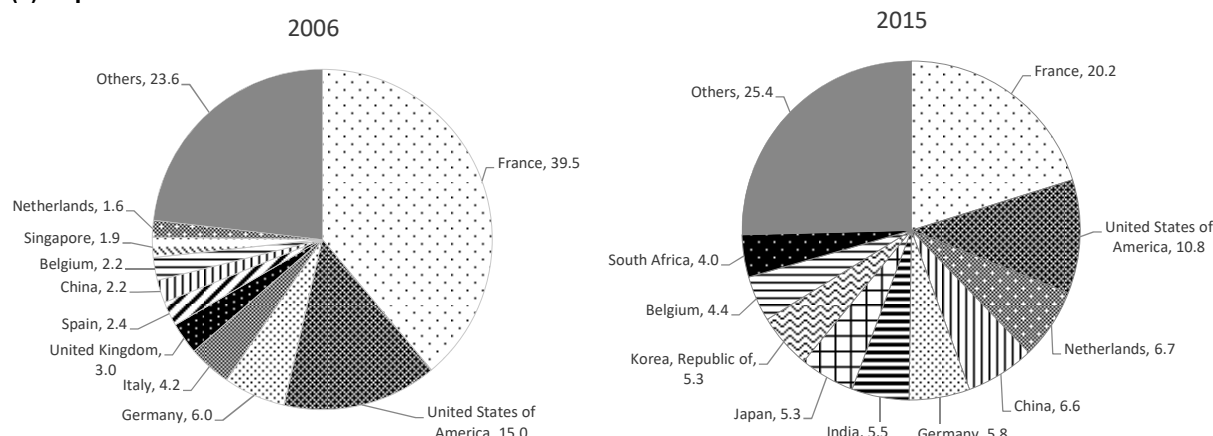
Source: JICA Study Team based on International Trade Centre (ITC) Data (July, 2017)

Figure 2.2.4 Total Service Trade by Value

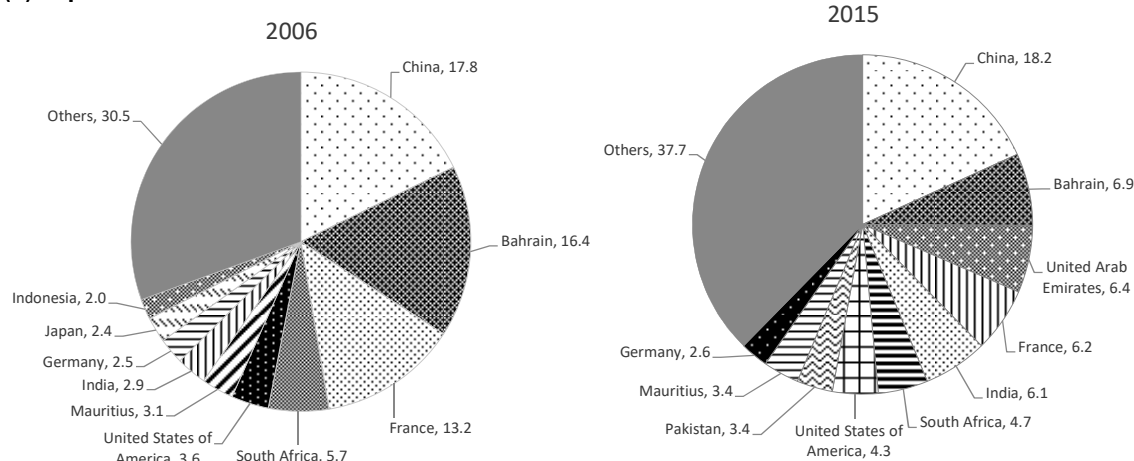
There are major changes in the geographic structure of Madagascar's export markets, as Figure 2.2.5 (a) shows. In the most recent ten years, the country's export markets have become highly diversified, with the shares accounted for by the European Union (EU) and the United States declining considerably, while those of Asian countries have grown.

On the other hand, China is one of Madagascar's main suppliers, accounting for over 18 percent of its imports in value terms in 2015. India has also significantly grown its market share of total Malagasy imports, rising from 2.9 percent to 6.1 percent.

#### (a) Exports



#### (b) Imports



Source: JICA Study Team based on International Trade Centre (ITC) Data (July, 2017)

Figure 2.2.5 Directions of Merchandise Trade of Madagascar, 2006 and 2014 (% of Total Value)



Madagascar also experienced significant changes in the structure of its merchandise exports. The country became a major exporter of nickel and other minerals, as Table 2.2.5 (a) indicates. In contrast, exports of clothing and other manufactured products, which had traditionally comprised the main group of products exported by Madagascar, plummeted in the wake of the trade sanctions imposed by Madagascar's trading partners. Despite this fact, the amount of exports of clothing and apparel goods increased slightly from 2006 to 2015. Exports of plant products also grew, consisting of cloves, vanilla, cocoa beans, groundnuts, lychees, unroasted coffee, and beans.

On the import side, as Table 2.2.5 (b) illustrates, the top 3 commodities are the same in 2006 and 2015. The largest import commodity is "Petroleum oils, other than crude" (HS code 2710).

**Table 2.2.5 Top 10 Export and Import Commodities of Madagascar in 2006 and in 2015**

**(a) Exports**

		2006				2015	
		US\$ mil.	%			US\$ mil.	%
1	Articles of apparel and clothing accessories, knitted or crocheted	183.4	18.2	Nickel and articles thereof		550.7	25.4
2	Articles of apparel and clothing accessories, not knitted or crocheted	160.7	15.9	Coffee, tea, maté and spices		393.4	18.2
3	Fish and crustaceans, molluscs and other aquatic invertebrates	139.2	13.8	Articles of apparel and clothing accessories, knitted or crocheted		206.4	9.5
4	Coffee, tea, maté and spices	93.2	9.2	Articles of apparel and clothing accessories, not knitted or crocheted		205.8	9.5
5	Mineral fuels, mineral oils and products of their distillation; bituminous substances; minerals	80.4	8.0	Other base metals; cement; articles thereof		95.2	4.4
6	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	45.1	4.5	Fish and crustaceans, molluscs and other aquatic invertebrates		90.5	4.2
7	Natural or cultured pearls, precious or semi-precious stones, precious metals, metal clad products	28.8	2.9	Ores, slag and ash		71.7	3.3
8	Printed books, newspapers, pictures and other products of the printing industry; manuscripts	28.8	2.9	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral		64.2	3.0
9	Wood and articles of wood; wood charcoal	20.9	2.1	Edible vegetables and certain roots and tubers		42.6	2.0
10	Cotton	16.4	1.6	Cotton		41.6	1.9
	Others	211.267	21.0	Others		402.3	18.6
Total		1,008.2	100.0	Total		2,164.5	100.0

**(b) Imports**

		2006				2015	
		US\$ mil.	%			US\$ mil.	%
1	Mineral fuels, mineral oils and products of their distillation; bituminous substances; minerals	329.2	18.7	Mineral fuels, mineral oils and products of their distillation; bituminous substances; minerals		496.9	16.8
2	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof	128.5	7.3	Machinery, mechanical appliances, nuclear reactors, boilers; parts thereof		237.8	8.0
3	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...	94.1	5.3	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television ...		174.0	5.9
4	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof	89.3	5.1	Salt; sulphur; earths and stone; plastering materials, lime and cement		159.6	5.4
5	Wool, fine or coarse animal hair; horsehair yarn and woven fabric	84.3	4.8	Vehicles other than railway or tramway rolling stock, and parts and accessories thereof		156.5	5.3
6	Cotton	77.5	4.4	Wool, fine or coarse animal hair; horsehair yarn and woven fabric		112.8	3.8
7	Plastics and articles thereof	55.3	3.1	Cotton		109.0	3.7
8	Knitted or crocheted fabrics	54.2	3.1	Cereals		106.6	3.6
9	Paper and paperboard; articles of paper pulp, of paper or of paperboard	52.8	3.0	Plastics and articles thereof		100.5	3.4
10	Cereals	48.1	2.7	Pharmaceutical products		98.4	3.3
	Others	747.1	42.4	Others		1,208.9	40.8
Total		1,760.3	100.0	Total		2,960.9	100.0

Source: JICA Study Team based on International Trade Centre (ITC) Data (July, 2017)

Over the past years, Madagascar has been liberalizing its trade regime on a regional basis. In particular, the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC) are leading regional integration in Southern Africa.

Madagascar is one of the founding members of the Treaty establishing COMESA. The COMESA tariff reduction programme began on 1 November 2000. Moreover, COMESA has a draft Common External Tariff (CET), the rates being 0% for raw materials and capital goods, 10% for intermediate products and 25% for finished goods.

In addition, Madagascar has been a member of SADC since 2005. Madagascar was suspended from the Organization's activities because of its political instability and did not take part in any negotiating meetings until 2014. Since then, Madagascar has resumed its participation in the various SADC meetings. Within the Free Trade Agreement (FTA), trade in goods considered as SADC-originating have been completely duty free since 2012, with few exceptions.

However, the share of intra-regional trade is still limited. For example, exports from Madagascar to SADC members averaged 5.8 percent of total exports during the period 2011-2015, as Table 2.2.6 shows. Moreover, imports from SADC members to Madagascar account for 9.8 percent during the period 2011-2015. South Africa, which drives intra-regional trade, is a major exporter and importer for Madagascar.

**Table 2.2.6 Trade Partners of Madagascar (%)**

		Export from Madagascar		Import to Madagascar	
		2001-2010	2011-2015	2001-2010	2011-2015
SADC	South Africa	1.2	3.8	5.9	5.4
	Mauritius	2.5	1.4	3.8	3.5
	Mozambique	0.0	0.1	0.1	0.1
	Seychelles	0.3	0.3	0.4	0.3
	Tanzania, United Republic of	0.1	0.1	0.1	0.2
	Zambia	0.0	0.0	0.0	0.0
	Swaziland	0.0	0.0	0.4	0.2
	Zimbabwe	0.0	0.0	0.0	0.0
	Congo, Democratic Republic of the	0.0	0.0	0.0	0.0
	Namibia	0.0	0.0	0.0	0.0
	Malawi	0.0	0.0	0.1	0.0
	Angola	0.0	0.0	0.0	0.0
	Lesotho	0.0	0.0	0.1	0.0
	Botswana	0.0	0.0	0.0	0.0
Africa (ex. SADC members)		2.0	2.2	1.5	2.1
North and South America		21.1	11.6	7.4	5.8
Asia		11.3	26.8	49.8	56.4
Europe		57.1	49.3	26.7	24.0
Others		4.2	4.2	3.5	1.9
World		100.0	100.0	100.0	100.0

Source: JICA Study Team based on International Trade Centre (ITC) Data (July, 2017)

### 2.2.3 Human Development of Madagascar

The human development index (HDI) of Madagascar ranked 161th among 189 countries in 2018. However, the rank of HDI among 31 low income countries is fourth in the world and is high despite its poor economic production (GDP per capita was ranked 185th among 194 countries in 2019). Some of the factors contributing to this ranking of Madagascar is the education and health situation. Socio-economic sustainability index such as share of skilled labour is also large compared to some of the neighbouring countries and francophone countries in Africa.

**Table 2.2.7 HDI of Madagascar, Neighbouring Countries and Major Francophone Countries in Africa (2018)**

	Madagascar	Mozambique	Kenya	Tanzania	Côte d'Ivoire	Burkina Faso	Senegal
Overall Ranking	161	180	142	154	170	183	164
HDI Index	0.519	0.437	0.590	0.538	0.492	0.423	0.505
Education Index	<b>0.498</b>	0.385	<b>0.551</b>	<b>0.441</b>	0.424	0.286	0.368
Expected Years of Schooling	<b>10.6 years</b>	9.7 years	<b>12.1 years</b>	8.9 years	9.0 years	8.5 years	<b>9.7 years</b>
Literacy Rate	<b>71.6%</b>	50.6%	<b>78.7%</b>	<b>77.9%</b>	43.9%	34.6%	42.8%
Gender Development Index	<b>0.962</b>	0.906	<b>0.931</b>	0.928	0.841	0.870	0.911
HIV Prevalence, adult	<b>0.2%</b>	12.3%	5.4%	4.7%	2.7%	<b>0.8%</b>	<b>0.4%</b>
Life Expectancy at Birth	<b>66.3</b>	58.9	<b>67.3</b>	<b>66.3</b>	54.1	60.8	<b>67.5</b>
Mortality Rate, infant (per 1,000)	<b>34</b>	53.1	<b>35.6</b>	40.3	66	52.7	<b>33.6</b>
GDP per Capita (2011 PPP \$)	1,416	1,136	N.A.	<b>2,683</b>	<b>3,601</b>	1,703	2,471
People using Improved Drinking Water Sources	50.6%	47.3%	58.5%	50.1%	<b>73.1%</b>	<b>59.3%</b>	<b>75.2%</b>
People using Improved Sanitation Facilities	9.7%	22.6%	<b>29.8%</b>	23.5%	<b>29.9%</b>	22.5%	<b>48.4%</b>
Skilled Labour Force (% of Labour Force)	<b>38.4%</b>	8%	N.A.	5.1%	<b>8.8%</b>	4%	<b>11.8%</b>

Note: Numbers in bold letters are the top three countries among the seven countries compared in the table.

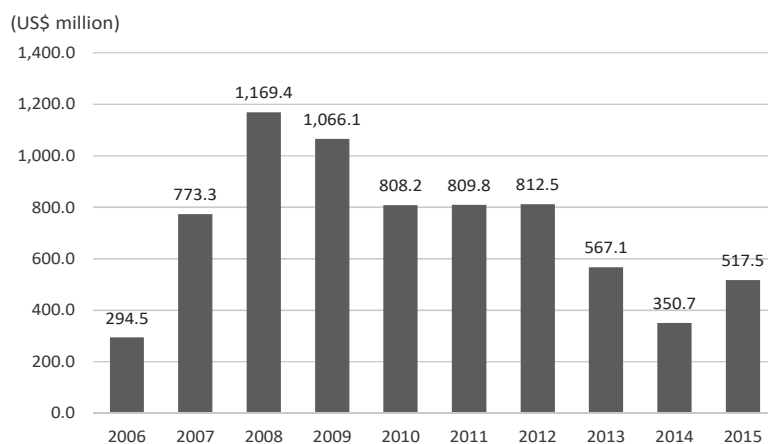
Source: United Nations Development Programme HP

## 2.2.4 Investment

### (1) Recent Trend of Foreign Direct Investment

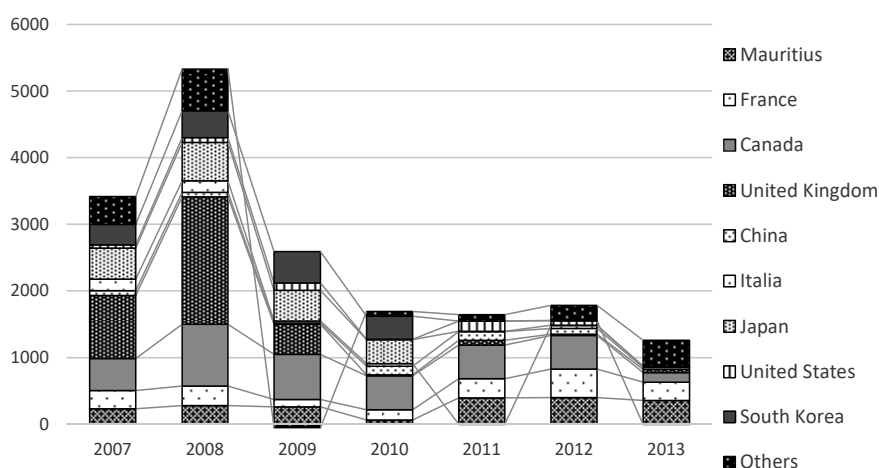
Foreign Direct Investment (FDI) in Madagascar peaked in 2008 at around US\$1,200 million, as Figure 2.2.6 illustrates. As with economic growth, FDI dropped significantly after the 2009 crisis, to US\$ 800 million in 2010, and flows have since been flat. However, because of continuing uncertainties in the political situation, FDI remains at a low level.

Figure 2.2.7 shows that Canada was the single largest source of FDI during the period 2007-2011, accounting for just under 30 percent of inflows. The UK and Japan together comprised from 2007 to 2010 an additional 30 percent, followed by Mauritius, Korea, and France, each with around 10 percent of FDI. The majority of this investment, especially from Canada, was into extractive industries, particularly mining.



Source: JICA Study Team based on UNCTAD Data

**Figure 2.2.6 Net FDI Flows of Madagascar**



Source: JICA Study Team based on “Etude sur les Investissements Directs Etrangers a Madagascar (INSTAT, 2015)”

**Figure 2.2.7 FDI Inflow to Madagascar by Country of Origin**

Table 2.2.8 shows that the largest FDI inflow was toward the extractive industry. There have been two large-scale investments in the mining sector since 2006 (QIT Madagascar Minerals (QMM) and the Ambatovy project. The other main FDI destinations are financial activities, telecommunications, manufacturing (including free-zone manufacturing) and construction and public works.

**Table 2.2.8 FDI Inflow to Madagascar by Sector**

	(billion Ariary)						
	2007	2008	2009	2010	2011	2012	2013
Agriculture, Hunting, livestock and forestry	-4.8	1.5	14.2	-0.8	-3.3	10.1	21.8
Fisheries, aquaculture	-26.1	6.5	18.8	34.7	7.3	41.7	2.1
Manufacturing operations	15.6	1	99.6	41.5	137	93.6	76.4
Production and distribution of gas, electricity and water	4.0	-2.5	0.3	0.2	3.8	1.1	28.2
Construction and public works	236.7	17.6	31.9	53.6	58.9	0.5	6.8
Mining and quarrying	886.2	1,637.5	2,069.8	1,360.0	1,000.6	750.5	231.0
Trade	0.9	42.4	30.9	18.4	34	48.7	26.6
Hotels and restaurants	171.1	1.1	37.5	36.1	1.8	6	2.9
Transports	-2.8	2.2	10.9	2.9	3.7	30	30
Financial activities	37.7	38.1	59.7	57.4	245.4	532.5	560
Real estate and business services	0.6	5.3	7.6	10.5	70.8	31.6	29.7
Oil distribution	108.9	16.3	65.4	58.2	7.8	14.3	90.4
Telecommunication	28.9	147.8	85.8	16.5	72	222.9	145.7
Others			0.2	-0.1	0.0		-0.1
<b>Total</b>	<b>1,456.9</b>	<b>1,914.8</b>	<b>2,532.5</b>	<b>1,689.1</b>	<b>1,639.9</b>	<b>1,783.4</b>	<b>1,251.5</b>

Source: JICA Study Team based on Etude sur les Investissements Directs Etrangers a Madagascar (INSTAT, 2015)

## (2) Investment Regimes

The legislative framework governing investment in Madagascar does not discriminate against foreign investors (however, only foreign share-holding in the telecommunications sector is capped at 66 percent of shares). Any natural person or legal entity, Malagasy or foreign, is free to invest in Madagascar in accordance with the laws and regulations in force, and national treatment is not denied to foreign investors in any sector. There is no discrimination against foreign investors at the time of the initial investment or after the investment is made, such as through special tax treatment, access to licenses, approvals, or procurement.

Since 2007, the Economic Development Board of Madagascar (EDBM) has been a key institution for promoting and supporting investment in Madagascar, and for the application of the country's investment regime. All companies, whether Malagasy or foreign-owned, must be registered with

the EDBM when they are set up. The EDBM has a website which is operational and is updated regularly, where most of the regulations relating to domestic economic activities can be accessed. Moreover, the EDBM has assumed responsibilities of the Single Window for investment, set up in 2004 to group together all of the services concerned with business start-up formalities.

Enterprises can invest in the country under three principal regimes: 1) the ordinary law regime, contained in the Law on Investment in Madagascar; which applies to enterprises that sell the vast majority of their products on the local market; 2) a specific framework established for large-scale mining investment and investment in hydrocarbons; and 3) an exceptional regime, contained in the Law on Free Zones and Enterprises (ZEFs) in Madagascar, which applies to enterprises that export at least 95% of their production. Unlike the ordinary law regime, the ZEF regime offers significant tax incentives and benefits. Equipment and other import materials that are used in ZEFs are exempt from custom duties. Moreover, most of the products can be imported without an import license.

The Malagasy government is developing new legislation on Special Economic Zones (SEZs). This legislation will differ from the existing Law on ZEFs by focusing on infrastructure and service provision incentives which specified geographic areas rather than on fiscal incentives for particular companies as in the existing legislation.

### (3) Environment for Doing Business

Improving the business environment is a government priority. According to “Word Bank’s Doing Business 2017”, Madagascar’s aggregated ranking on the ease of doing business is 167 out of 190 countries, as shown in Table 2.2.9. The repeated political crises account for the decline of most of the country’s indicators used by the Doing Business report, but there has been significant progress regarding the cost and number of days needed to start a business, which is probably due to EDBM’s effort.

**Table 2.2.9 Business Environment for Enterprises in Madagascar and in Neighbouring Countries, 2008 and 2017**

	Madagascar		Mauritius		Mozambique		South Africa	
	2008	2017	2008	2017	2008	2017	2008	2017
Overall Ranking (a)	149	167	27	49	134	137	35	74
Starting a business	61	113	8	48	125	134	53	131
Dealing with construction permits	-	184	-	33	-	30	-	99
Access to electricity	-	185	-	110	-	168	-	111
Registering property	165	159	153	98	126	107	76	105
Getting credit	176	170	97	44	97	157	26	62
Protecting minority investors	51	114	11	32	33	132	9	22
Paying taxes	86	117	11	45	72	112	61	51
Trading across borders	126	129	17	74	140	106	134	139
Enforcing contracts	151	158	78	34	138	185	85	113
Resolving insolvency	-	127	66	39	134	65	68	50

Notes: (a) The 2008 and 2017 rankings are based on 178 and 190 countries and economies, respectively.

Source: JICA Study Team based on Doing Business (World Bank, 2008 and 2017)

## 2.2.5 Poverty

Madagascar is one of the poorest countries in the world. As shown in Table 2.2.10, the people in poverty reached 78% and 91% in 2012, according to the indicators of the population living on less than \$1.90 a day and \$3.10 a day respectively. The poverty in the country has shown an increase until 2010 due to the political unrest. Though the poverty incidence slightly declined by 2012, the number of the population living in poverty has kept growing. The Human Development Index (HDI) of the country is 0.512 in 2015, ranking at 158th among 188 countries that modestly improved from 0.462 in 2001.

**Table 2.2.10 Poverty Ratio and HDI in Madagascar**

Indicators	2001	2005	2010	2012	2015
Number of poor at \$1.90 a day (2011 PPP) (millions)	11.2	13.5	17.2	17.4	-
Working poor at \$3.10 a day (2011 PPP) (millions)	13.7	16.4	19.6	20.2	-
Poverty headcount ratio at \$1.90 a day (2011 PPP) (% of population)	68.7%	74.1%	81.8%	77.8%	-
Poverty headcount ratio at \$3.10 a day (2011 PPP) (% of population)	84.1%	89.9%	92.9%	90.5%	-
Poverty headcount ratio at national poverty lines (% of population)	70.8%	75.0%	75.3%	-	-
Urban poverty headcount ratio at national poverty lines (% of urban population)	45.6%	55.2%	51.1%	-	-
Rural poverty headcount ratio at national poverty lines (% of rural population)	78.2%	80.6%	81.5%	-	-
Human Development Index (HDI)	0.462	0.478	0.504	0.508	0.512

Source: World Bank. Database: Poverty and Equity.

<http://databank.worldbank.org/data/reports.aspx?source=poverty-and-equity-database#>, Accessed in September 2017.

UNDP. Human Development Report. Accessed in <http://hdr.undp.org/en/data>, Accessed in September 2017.

The poverty is widespread in the rural areas where the poverty incidence among the population accounts for 82%, compared with 51% in the urban areas in 2012/2013. The highest poverty incidence over 90% is identified in the regions of Androy and Atsimo Atsinanana; the poverty incidence of 42% is the lowest in Diana Region. The poverty ratio in Analamanga Region, where the Capital City of Antananarivo is located, is 47%, the second lowest among 22 regions, though the number of the poor accounts for 10% of the national total population in poverty. On the other hand, the poverty ratio in Atsinanana is 65%, 7<sup>th</sup> among 22 regions, which is higher than Analamanga, but still lower than the national average of 72%. Among the different occupations, the poverty incidence is high among farmers. About 85% of the small and medium scale farmers are living in poverty, accounting for 59% of the total poor population.<sup>2</sup>

The increased poverty incidence in the past decade is explained by stagnation of the economy affected by the last political turmoil. In particular, the formal employment became scarce because of shutting down of factories in the urban areas and increasing workers who sought jobs in the informal and agriculture sectors.

**Table 2.2.11 Poverty Incidence by Urban/Rural**

Location	Poverty Incidence	Share of Population in Poverty
Capital	30.7%	2.6%
Urban excluding the Capital	56.1%	11.0%
Rural	77.3%	86.4%
National Average	71.5%	100.0%

Source: INSTAT/ENSOMD 2012-2013

**Table 2.2.12 Poverty Incidence by Region**

Rank	Region	Poverty Incidence	Share of Population in Poverty	Rank	Region	Poverty Incidence	Share of Population in Poverty
1	Androy	96.7%	4.5%	12	Haute Matsiatra	76.1%	5.9%
2	Atsimo Atsinanana	93.1%	5.4%	13	Melaky	73.9%	1.4%
3	Vakinankaratra	88.6%	10.2%	14	Itasy	69.6%	3.3%
4	Amoron'i Mania	85.5%	3.9%	15	Menabe	68.5%	2.7%
5	Anosy	85.4%	3.6%	16	Atsinanana	64.6%	5.2%
6	Sofia	83.8%	6.7%	17	Betsiboka	63.9%	1.2%
7	Atsimo Andrefana	80.1%	6.7%	18	Analanjorofo	63.5%	4.1%
8	Sava	80.0%	4.8%	19	Alaotra Mangoro	62.5%	4.1%
9	Vatovavy Fitovinany	79.6%	7.2%	20	Boeny	59.4%	3.1%
10	Ihorombe	78.2%	1.6%	21	Analamanga	47.0%	10.1%
11	Bongolava	76.9%	2.2%	22	Diana	42.2%	19.0%
					Madagascar Total	71.5%	100.0%

Source: INSTAT/ENSOMD 2012-2013

<sup>2</sup> INSTAT/ENSOMD 2012-2013

## 2.3 National Development Potential of Madagascar

### 2.3.1 SWOT Analysis of Madagascar

A SWOT Analysis was conducted considering Madagascar's socio-economic development in relation to the development of the Overall TaToM Area.

Table 2.3.1 SWOT Analysis for Madagascar

Strength	Weakness
<ul style="list-style-type: none"> <li>An abundant, relatively low-wage labour force exists in Madagascar. The wage level of Madagascar belongs to the group of 25 countries with the lowest minimum wages.</li> <li>The labour force is hard working and good with hands.</li> <li>A large amount of labour force is concentrated especially in Antananarivo Agglomeration, the capital of Madagascar.</li> <li>An export-oriented textile industry is prominent in Madagascar. It has been incorporated in the global value chain.</li> <li>Madagascar is one of the world-famous destinations of international tourism because of rare animals and plants.</li> </ul>	<ul style="list-style-type: none"> <li>The school education system has so degraded that students cannot acquire basic academic skills. As a result, the basic academic skills of young people have declined.</li> <li>The condition of economic infrastructure, such as power supply, water supply and access roads, is poor. As a result, it is difficult to attract investments to economic sectors so as to promote the development of the economic sectors.</li> <li>Government funds for infrastructure development are largely lacking.</li> <li>Government capacity is too weak to promote agricultural and industrial development.</li> <li>Night-soil is not properly treated and disposed. Hygiene is problematic in urban areas including Antananarivo and Toamasina Agglomerations where population is concentrated.</li> <li>National land is vast in comparison with the population size. Hence population density is low and national land is not fully utilised because every part of the country is not connected to each other effectively by modes of land or sea transport.</li> <li>Management reform of Air Madagascar has been in progress. Due to the difficult reform of Air Madagascar, cities in Madagascar are not effectively connected by airline flights; therefore, it is not possible to use national land (e. g., promotion of tourism) effectively for socio-economic development.</li> </ul>
Opportunities	Threat
<ul style="list-style-type: none"> <li>Madagascar is a member country of regional economic communities (RECs), such as SADC, COMESA and IORA. By promoting the regional economic integration related to those organizations, it will become possible to get access to the regional markets with high growth potentiality and to develop economic sectors targeting the regional consumer markets.</li> <li>With expansion of Toamasina Port, world largest container vessels will be able to call at the Toamasina Port for transshipment like Port Louis in Mauritius and feeder ships will run from Toamasina Port to ports in the eastern and southern Africa. As a result, access by cargo ships to markets of countries in the Indian Ocean and on the African Continent will become easier, the cost of transport to those countries will be reduced and the possibility of promoting economic sectors targeting regional markets will increase.</li> <li>Madagascar's national population growth rates are still high, and its demographic dividend will reach the highest after year 2050.</li> <li>Wages of workers in China and Southeast Asia are gradually increasing. Still having cheap, abundant labour force, South Asian countries, like Bangladesh and Pakistan, do not have so large production capacity as China. There are not so many countries that can take over China's position of low cost manufacturing. However, Madagascar is one of such countries.</li> <li>With the rehabilitation of Pangalanes Canal and land development for agriculture along the canal, agricultural production targeting world markets will increase. There is a possibility to develop processing industry in Toamasina Agglomeration, using part of the agricultural products.</li> <li>If the market value of high viscosity crude reserved in the western part of Madagascar increases, crude oil development will progress and Madagascar's fuel will rely on domestic crude oil. Abundant energy will be available and the economic sectors will be further developed.</li> </ul>	<ul style="list-style-type: none"> <li>Political crises and instability will continue in Madagascar. Madagascar will not attract investments to its economic sectors. Since ODA will be reduced, economic infrastructure will not be substantially developed. As a result, economic sectors will not develop well.</li> <li>There is a possibility that the regional economic integration will not be implemented as expected, even with the institutionalisation of the regional economic integration of COMESA, SADC, and IORA.</li> <li>Even if the regional economic integration progresses, economic sector development in Madagascar will not be realised because the influx of products from South Africa and other countries in the region will reduce development opportunities of Madagascar's economic sectors.</li> </ul>

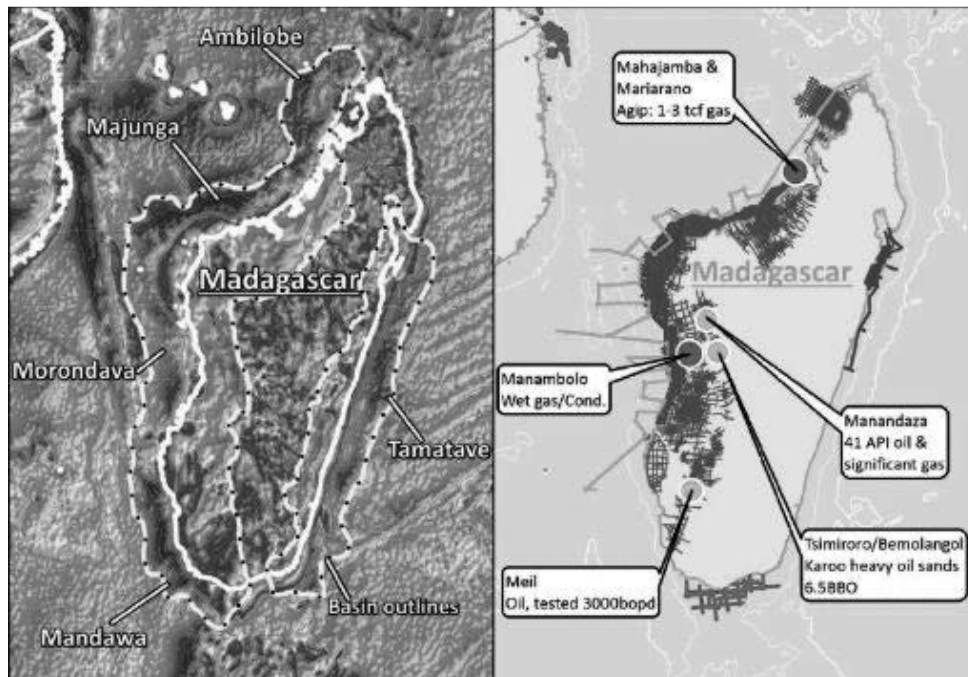
Source: JICA Study Team

## 2.3.2 National Development Potential of Madagascar

### (1) Development Potential of Mineral Resources

While the industry sector activities of Madagascar are dominated by food, beverage and energy production, the importance of the mining sector is growing due to two recent large-scale mining operations. One is Rio Tinto's ilmenite mining operation in the south-eastern part of the country, and the other is Ambatovy's nickel and cobalt mining in the eastern part of the country.

Besides the above two mineral resources, Madagascar is said to be a heavy oil-rich country with oil-rich sedimentary basins of Morondava, Majunga and Ambilobe, which is believed to hold at least 75 billion barrels. Once a study is conducted to know the proven reserve amount, it could put Madagascar in one of the top 10 countries with most oil reserves.



Source: A.Intawong and K. Rodriguez, 2015, Petroleum System and Play Type Identification, Western and Eastern Offshore Madagascar

**Figure 2.3.1 Sedimentary Basins of Morondava, Majunga and Ambilobe for Heavy Oil**

Although heavy oil abounds in western Madagascar, most projects were abandoned in the past, due to the lack of infrastructure in the country and the economic situation. It has also been said for a long time, extraction costs for heavy oil were too high to make it worthwhile. With the improvements in oil extraction technology and the surge in the price of oil, Madagascar has a great potential in oil development.

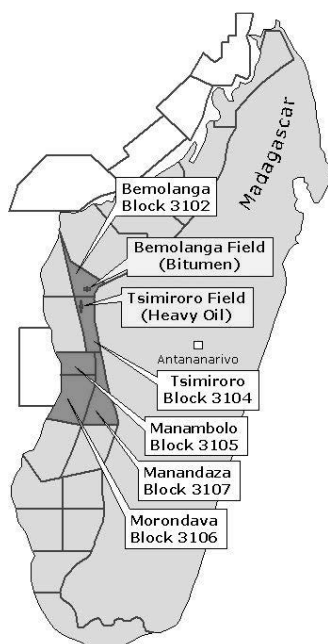
The global situation with the demand of oil increasing due to the growing economies of China and India is also a favourable condition for Madagascar. Moreover, some of the prolific reserves around the world such as Mexico's Cantarell oilfield are starting to reduce its production rate.

The primary market for the heavy oil will be the global market, since Madagascar only consumes about 15,000 barrels of oil equivalent a day. Asian markets has been indicated as the best market for Madagascar's heavy oil production according to the study commissioned by Madagascar Oil, the oil and gas company with oil and gas exploration and development rights in Block 3104 (Tsimiroro) and Block 3102 (Bemolanga) at onshore Madagascar.

Although Madagascar's endowment situation of heavy oil resources is a good development potential, there is no clear forecast of when the resources are marketable enough at the international market to support Madagascar's social and economic development. Therefore, it is necessary to promote manufacturing industries on which Madagascar is competitive enough in the regional and



global markets, in addition to existing exports of primary commodities, such as Nickel, Cobalt, vanilla, clove and aromatic oil.

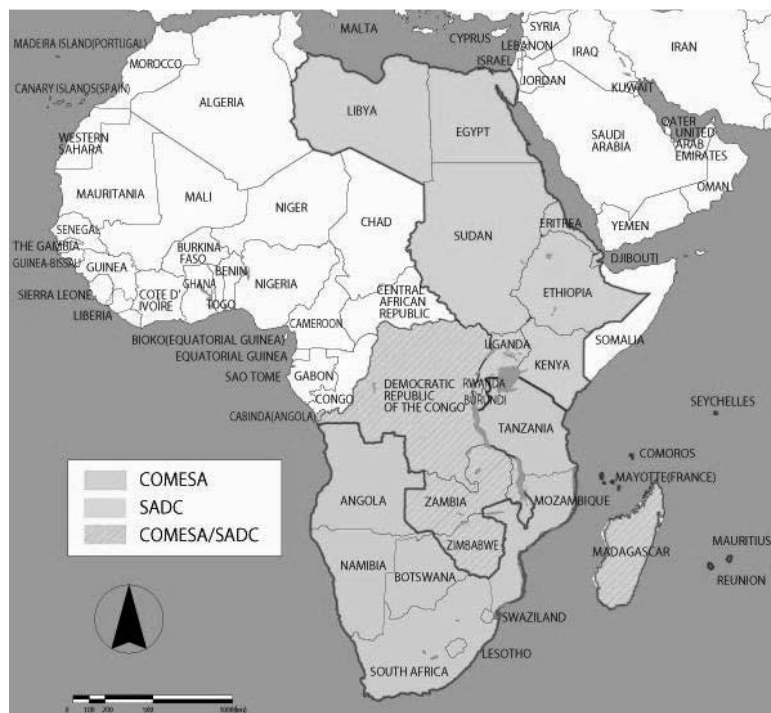


Source: Energy Key Facts Ltd.

**Figure 2.3.2 Bemolanga Field and Tsimiroro Field in Madagascar**

**(2) Population, Urbanization and Changes in the Lifestyle and Consumption Patterns of African Countries: Expanding of the Size of Consumer Goods Markets in Free Trade Areas in African Countries**

Over the past years, Madagascar has been liberalizing its trade regime on a regional basis. In particular, the Common Market for Eastern and Southern Africa (COMESA) and the Southern African Development Community (SADC) are leading regional integration in southern Africa.



Source: JICA Study Team based on COMESA and SADC HPs

**Figure 2.3.3 Member Countries of SADC and COMESA**

Madagascar is one of the founding members of the Treaty establishing COMESA. The COMESA tariff reduction programme began on 1 November 2000.

In addition, Madagascar has been a member of SADC since 2005. Although Madagascar was suspended from the Organization's activities because of its political instability, since 2014, Madagascar has resumed its participation in the various SADC meetings. Within the Free Trade Agreement (FTA), trade in goods considered as SADC-originating have been completely duty free since 2012, with few exceptions.

Moreover, the Heads of State and Government of the Common Market for Eastern and Southern Africa (COMESA), East African Community (EAC) and Southern African Development Community (SADC) have been discussing to officially launch the COMESA-EAC-SADC Tripartite Free Trade Area (TFTA). At present, 24 of the 26 member states have signed the Declaration leaving Libya and Eritrea yet to sign.

The countries in these regional economic partnerships are countries with growing population and economy. In 2015, the total population of these two regional economic communities were 675 million, and is projected to increase to 958 million in 2030 and further to 1,393 million by 2050. The urban population is also increasing rapidly in these countries with total of 216 million urban populations in 2014 which are to become over 700 million in 2050. This is equivalent to the present urban population in China.

**Table 2.3.2 Size of Populations and Economies of the Countries in COMESA and SADC**

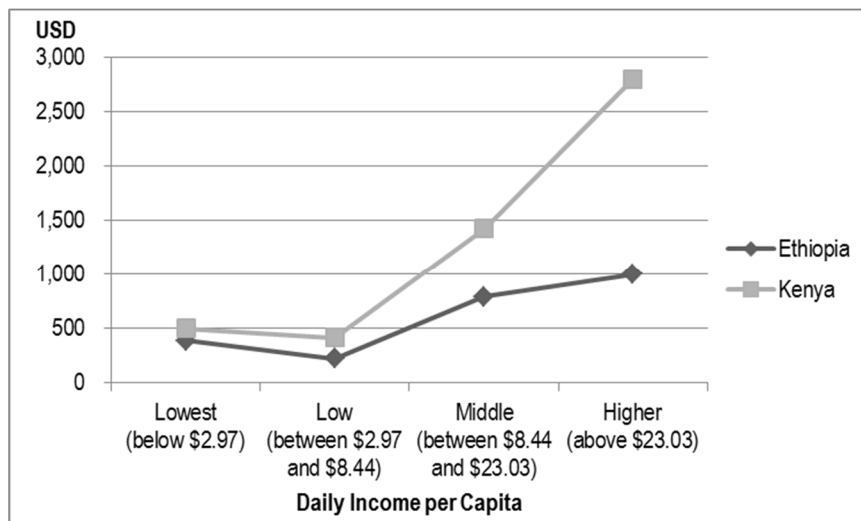
Country	Regional Economic Community		Population (thousand)			Urban Population (thousand)	GDP Current Price (Million USD)	GDP per Capita (USD)
	COMESA	SADC	2015	2030	2050	2014	2015	2015
Angola		✓	25,022	39,351	65,473	9,580	102,621	4,101
Botswana		✓	2,262	2,817	3,389	1,166	14,445	6,386
Burundi	✓		11,179	27,244	42,789	1,233	3,005	269
Union of Comoros	✓		788	1,081	1,502	212	590	749
DR Congo	✓	✓	77,267	120,304	195,277	29,115	38,402	497
Djibouti	✓		888	1,054	1,186	685	1,727	1,945
Egypt	✓		91,508	117,102	151,111	35,914	332,075	3,629
Eritrea	✓		5,228	7,311	10,421	1,451	4,442	850
Ethiopia	✓		99,391	138,297	188,455	18,363	64,683	651
Kenya	✓		46,050	65,412	95,505	11,476	63,995	1,390
Lesotho		✓	2,135	2,486	2,987	562	2,351	1,101
Libya	✓		6,278	7,418	8,375	4,900	17,194	2,739
Madagascar	✓	✓	24,235	35,960	55,294	8,125	9,744	402
Malawi	✓	✓	30,331	36,107	40,725	2,710	6,402	211
Mauritius	✓	✓	1,273	1,310	1,249	497	11,511	9,042
Mozambique		✓	27,978	41,437	65,544	8,454	14,798	529
Namibia		✓	2,459	3,272	4,322	1,073	11,577	4,708
Seychelles	✓	✓	96	101	100	50	1,377	14,344
South Africa		✓	54,490	60,034	65,540	34,168	317,698	5,830
Sudan	✓		40,235	56,443	80,284	13,034	64,059	1,592
Swaziland	✓	✓	1,287	1,507	1,792	270	3,929	3,053
Tanzania		✓	53,470	82,927	137,136	15,685	45,634	853
Uganda	✓		39,032	61,929	101,873	6,124	25,208	646
Zambia	✓	✓	16,212	25,313	42,975	6,079	21,243	1,310
Zimbabwe	✓	✓	15,603	21,353	29,615	4,745	16,072	1,030
Total	18	15	674,697	957,570	1,392,919	215,671	1,194,782	1,771

Source 1: United Nations Economic & Social Affairs, 2015, World Population Prospects: The 2015 Revision

Source 2: United Nations Economic & Social Affairs, 2014, World Urbanization Prospects: The 2014 Revision

Source 3: IMF, World Economic Outlook April 2018

Although these countries still have most of their population living under US\$8.44 per day, the lifestyle in these countries are also changing as the middle income population is gradually increasing in the urban areas. The consumption amount of food and clothes by consumption segment in the urban areas of two of the major COMESA countries are shown in Figure 2.3.4. In these countries although the consumption amount does not change so much between the lowest and low consumption segment, the yearly consumption amount more than doubles for the household in the middle consumption segment which earns between US\$ 8.44 and US\$ 23.3. This shows the trend that the amount of each household uses for daily basic goods increase from the middle consumption segment.



Source: World Bank, Global Consumption Database

**Figure 2.3.4 Household Consumption of Food and Clothing by Consumption Segment in Ethiopia and Kenya (2010)**

Along with the development of Toamasina Port, which will increase the capacity of handling volume for transshipment and export-import, and the increase in the size of market in COMESA and SADC countries, Madagascar could become one of the major producing countries to supply consumer goods to these growing markets.

### (3) Potential of Madagascar as Future Labour Market

The economically active population is relatively young in Madagascar as those who are below 25 years old represented 49% of the economically active population. The population of Madagascar is expected to continue to increase at a high rate and the productive population (population aged between 15 and 64) will reach 36 million in 2050 and 69 million in 2100.

Madagascar is also an attractive country in terms of cost of labour. Although Madagascar's minimum wage was revised in 2015 and there are several countries with lower wages as of today, Madagascar is still one of the countries with low minimum wages among textile or clothing exporting countries and is the lowest among the African important clothing producers, namely, Morocco, Mauritius, Tunisia and Madagascar. Comparing with Bangladesh, one of the major textile exporting countries in Asia, the minimum wage for textile industry is US\$ 816 per year, slightly lower than the minimum wage of Madagascar.

In addition, China's shares in the world textile and apparel exports, which has the largest share in the world are dropping and could be taken over by other countries with cheaper labour cost including Madagascar.

**Table 2.3.3 Lowest Minimum Wages in the World**

Ranking	2012		2016		2018	
	Countries	Hourly Minimum Wage	Countries	Hourly Minimum Wage	Countries	Yearly Minimum Wage
1	Madagascar	US\$ 0.18	Uganda	US\$ 0.01	Uganda	US\$ 95
2	Bangladesh	US\$ 0.23	Georgia	US\$ 0.05	Sierra Leone	US\$ 211
3	Pakistan	US\$ 0.32	Cuba	US\$ 0.05	Bangladesh	US\$ 213
4	Ghana	US\$ 0.32	Kyrgyzstan	US\$ 0.09	Kyrgyzstan	US\$ 251
5	Viet Nam	US\$ 0.39	Bangladesh	US\$ 0.09	Georgia	US\$ 279
6	India	US\$ 0.48	Tanzania	US\$ 0.10	Myanmar	US\$ 401
7	Kenya	US\$ 0.50	Gambia	US\$ 0.13	Tajikistan	US\$ 477
8	Senegal	US\$ 0.52	Venezuela	US\$ 0.17	Malawi	US\$ 494
9	Sri Lanka	US\$ 0.62	Guinea Bissau	US\$ 0.17	Rwanda	US\$ 496
10	Greece	US\$ 0.80	Malawi	US\$ 0.17	Uzbekistan	US\$ 490
11			Liberia	US\$ 0.17	Eritrea	US\$ 526
12			DR Congo	US\$ 0.20	Lesotho	US\$ 664
13			Tajikistan	US\$ 0.23	Ghana	US\$ 689
14			Ghana	US\$ 0.23	Sao Tome	US\$ 747
15			Madagascar	US\$ 0.23	Moldova	US\$ 810
16					Haiti	US\$ 817
17					Kenya	US\$ 830
18					Swaziland	US\$ 848
19					Ethiopia	US\$ 902
20					Zambia	US\$ 917
21					Madagascar	US\$ 981

Source 1 (2012): The Richest, <https://www.therichest.com/rich-list/poorest-list/countries-with-the-cheapest-labor/>

Source 2 (2016): The Richest, <https://www.therichest.com/world-money/15-countries-with-the-cheapest-labor/>

Source 3 (2018): Minimum-Wage.org, <https://www.minimum-wage.org/international>

Madagascar's minimum wage is also the lowest among the Francophone countries in Africa. This has brought French firms to start call centres in Madagascar which is expected to grow to 100,000 by 2020 according to the Economic Development Board of Madagascar.

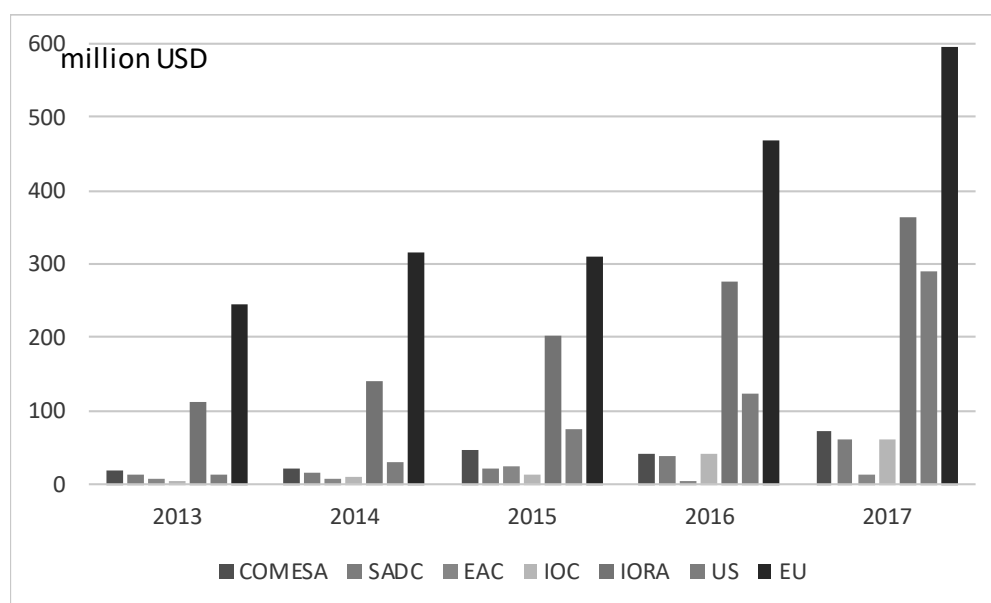
In accordance with the data of values of manufacturing merchandise export (for year 2018), Madagascar has the 19th largest exporting country of manufacturing merchandise export in African countries. When limiting to low labour cost countries among the African countries, Madagascar is one of the top five countries of manufacturing merchandise export including Kenya, Tanzania, Uganda, Ethiopia.

#### **(4) Development Potential of Agro-industry and Manufacturing Light Industries**

Agriculture and agro-industry are important sectors of the national economy of Madagascar, although both have a number of development constraints. Recognising the potential of agricultural production of Madagascar, the Indian Ocean Commission (IOC) launched the regional food security project that would supply food products to its member countries as well as neighbouring and other countries. This project, aiming to make Madagascar the "Grenier de l'océan Indien", was adopted by the Council of Ministers of the IOC in February 2016 as the Regional Programme for Food Security and Nutrition (PRESAN: *Programme régional de sécurité alimentaire et de nutrition*). The project, technically supported by FAO and financed by the European Development Fund (EDF), was implemented for five years to promote agricultural products of common interest in the region as well and increase productivity, output, competitiveness and trade between the island countries in the Indian Oceans hence improving food and nutrition security in the Indian Ocean States.

Although the biggest export market for Madagascar's agriculture and food products is EU, the export to IOC has been steadily increased to almost the same level with that of COMESA and SADC. However, its export to IORA (Indian Ocean Rim Association) is much larger than the

export to these countries, and it is growing more rapidly. In addition, export to the US market has been also increasing.



Source: JICA Study Team based on Comtrade data

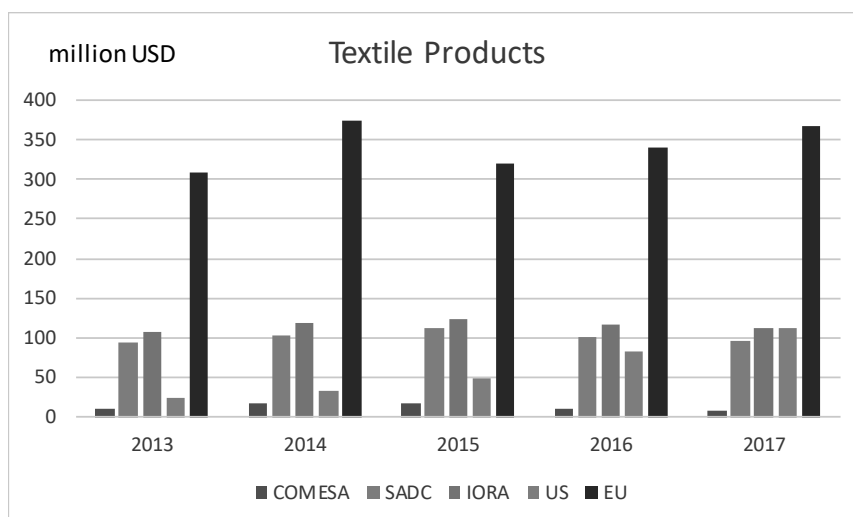
**Figure 2.3.5 Trend of Agriculture and Food Products<sup>3</sup> Export by Madagascar to Neighbouring Regional Groups, US and EU**

Considering the limited number of member countries (i.e., Madagascar, Mauritius, Comoros, Seychelles and Reunion) and thus small market size of IOC vis-à-vis the numerous and various (in fact, partly overlapping with IOC) member countries of IORA<sup>4</sup>, the latter is a much more attractive market for Madagascar. Utilising the cooperation in the framework of IOC, Madagascar is expected to enhance and expand its production and export capacity of agriculture and food products to IORA countries.

The potential of export development to IORA and other countries is also recognised in other sectors. For instance, textile products exported from Madagascar to IORA and SADC countries are valued at around 100 million USD, respectively, every year which is around 1/3 of the export to the EU market. In 2016, combined export of light industry products (including soap, footwear, ceramic products, glassware and cutlery) to COMESA, SADC, IOC and IORA was over 500 thousand USD which is larger than the export to the EU market in every recent year except for 2016. Furthermore, in 2017, combined export of essential oil (which is one of the most important exports of Madagascar) perfumery and cosmetics to COMESA, SADC, EAC and IORA countries was more than 20 million USD, which is close to the export to EU in the same year. These figures show that the capacity enhancement of the above-mentioned sectors will contribute to the increase of exports to the surrounding countries in Africa and the Indian Ocean. In addition, the expansion of Toamasina Port and its utilisation in a competitive, but complementary, manner with Port Louis in Mauritius will reduce the present high cost of transportation.

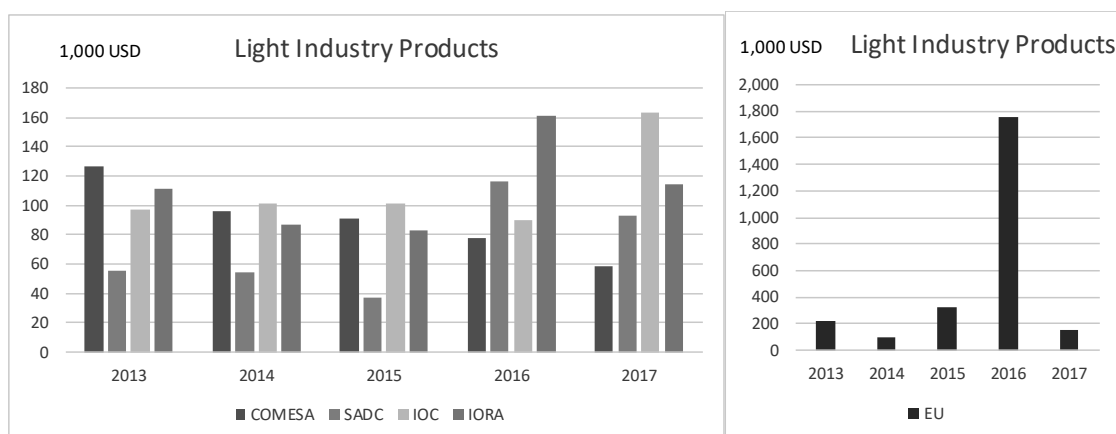
<sup>3</sup> Aggregation of HS categorized goods from HS01 to HS24.

<sup>4</sup> The member states of IORA are Australia, Bangladesh, Comoros, India, Indonesia, Iran, Kenya, Madagascar, Malaysia, Mauritius, Mozambique, Oman, Seychelles, Singapore, Somalia, South Africa, Sri Lanka, Tanzania, Thailand, UAE and Yemen.



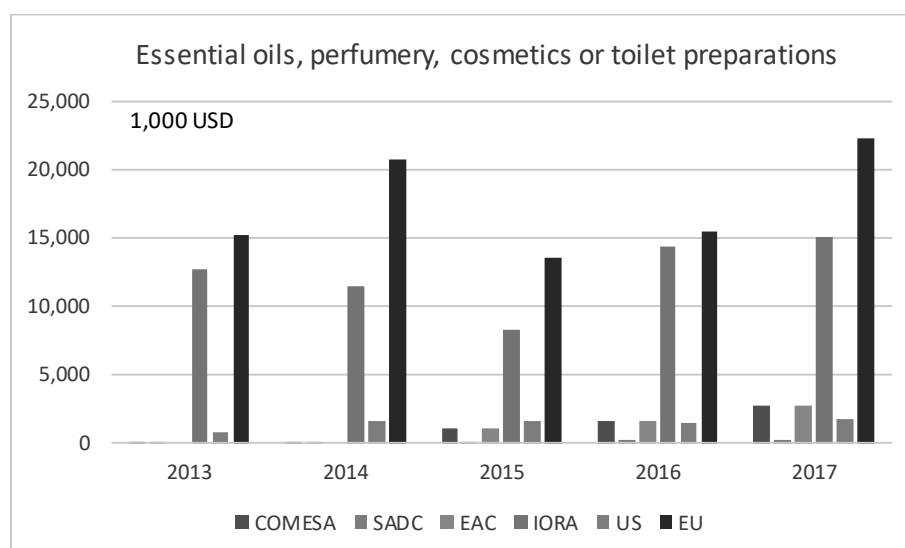
Source: JICA Study Team based on Comtrade data

Figure 2.3.6 Trends of Textile Export by Madagascar to Neighbouring Regional Groups, US and EU



Source: JICA Study Team based on Comtrade data

Figure 2.3.7 Trends of Light Industry Products Export by Madagascar to Neighbouring Regional Groups and EU



Source: JICA Study Team based on Comtrade data

Figure 2.3.8 Trends of Essential Oils Export by Madagascar to Neighbouring Regional Groups, US and EU

### 2.3.3 Development Potential Industries in Madagascar

As described above, following industrial sectors and products have the potential of further development with export expansion to the surrounding countries in Africa and the Indian Ocean:

- Agriculture and food industry (agro-processing)
- Textile and apparel industry
- Light industry
- Essential oil, perfumery and cosmetics

In addition, mining, tourism and ICT sectors have been attracting foreign investment with abundant resources. These sectors also have further development opportunities with expanding their markets on a global scale.

Comparing with these industries, the above mentioned potential industries, i.e., agriculture and manufacturing may have potential for more dynamic growth because of the population increase, urbanization and changes in the lifestyle and consumption patterns of the middle income groups in the African and Indian Ocean countries. Such increasing demands by middle income populations could be satisfied by agro-processing, textile-apparel and light industrial products shown in Table 2.3.4.

To meet the increasing demand in these areas, strengthening of supply capacity is necessary than any other things. However, considering the current situation of Madagascar, improvement of overall economic infrastructure and administrative set up is required.

One effective way to resolve the “weakness” not only in Madagascar, but also in developing countries in general, is establishing industrial parks and Economic Development Zones<sup>5</sup> with well-developed infrastructure and various incentives to attract foreign investment. In Madagascar, industrial investment zones are planned and promoted to be established under new legislations. Therefore, these facilities should be utilized to develop the potential industries.

It is quite important to promote linkages between companies in industrial zones and local suppliers in the region to develop value chains. In this regard, capacity improvement of the local suppliers (SMEs and small farmers) in terms of production skills and facilities is also required.

Subsector compositions of each potential industry located in the industrial zones and linkage with local suppliers are envisaged in Table 2.3.4.

**Table 2.3.4 Subsector Composition of Potential Industries and Local Suppliers**

Industry Sector	Subsectors in Industrial Zones	Local Suppliers
Agro-processing	<ul style="list-style-type: none"> <li>• Food and Beverage,</li> <li>• Spices,</li> <li>• Essential oils and perfumery</li> </ul>	<ul style="list-style-type: none"> <li>• Small farmers, Farmers associations,</li> <li>• Package manufacturers,</li> <li>• Traders/Importers</li> </ul>
Textile and apparel	<ul style="list-style-type: none"> <li>• Fabric clothing,</li> <li>• Spinning, Weaving,</li> <li>• Dyeing</li> </ul>	<ul style="list-style-type: none"> <li>• Accessory /finding manufacturers,</li> <li>• Package manufacturers,</li> <li>• Cotton producers/traders</li> </ul>
Light industry	<ul style="list-style-type: none"> <li>• Soap, Footwear, Ceramic products, Glassware and Cutleries, Cosmetics,</li> <li>• Household Sundries, Kitchen and Dining Products, Baby Goods and Body Care Products</li> <li>• Crafts and artisanal products, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Palm tree farmers,</li> <li>• Mining companies,</li> <li>• Metal manufacturers,</li> <li>• Package manufacturers,</li> <li>• Traders/Importers</li> </ul>

Source: JICA Study Team

Agro-processing sector includes food, beverage, spices, essential oils and perfumery producers. These products need various agriculture products for materials, such as vegetables, fruits, grains,

<sup>5</sup> In many countries, the Economic Development Zone is called “Special Economic Zone (SEZ).”

sugar cane, meat, etc. Among others, high value cash crops such as vanilla, clove and ylang-ylang are indispensable for spices, essential oils and perfumery. To realize sustainable development of these agro-processing industries, contract farming and grouping of small-scale farmers are particularly important, as the farmers tend to be separated and exploited by middlemen and foreign buyers, as well as exposed to insecurity.

Textile and apparel industry in Madagascar is mostly operated by so-called CMP (cutting, making and packaging) system, in which designs and patterns of clothes are made by foreign orderers, factories in Madagascar are only in charge of assembling elements, most of which are also provided by the orderers. In other words, Madagascar (and many other developing countries that are engaged in CMP system) only provides cheap labour and work places and incorporated as one part of supply chains.

However, subsector companies to be located in the industrial zones should include not only fabricators, but also other players in supply chain, i.e., spinning, weaving and dyeing factories. The linkage with local material suppliers should be also promoted, including cotton producers and traders.

Light industry is supposed to include various subsectors as indicated before, such as soap, footwear, ceramic products, glassware and cutleries. In addition, cosmetics, crafts and artisanal products and many others also could be included. These various manufacturing industries (most of them are supposed SMEs and micro enterprises) are concentrated in the Antananarivo Agglomeration, and to some extent, in Toamasina Agglomeration.

Although these industries can procure materials from local market, many of them should be imported, thus the process engineering technology to absorb import cost is required. When indigenous materials, such as palm (for soap), clay (for ceramic) silica sand (for glassware), and metals (for cutleries) are available, their stable supply and quality control are necessary. In both cases, upgrading of technologies and human capacity for subsector companies and suppliers are also necessary.

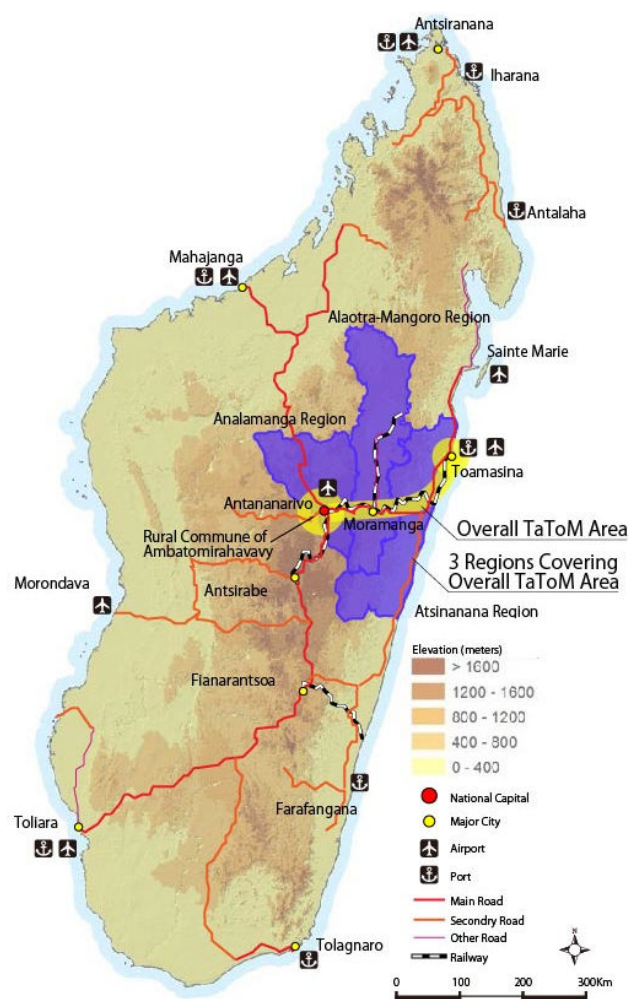


## Chapter 3 Overall TaToM Area: Future Vision, Potentials, Growth Scenarios and Socio-Economic Frameworks for Overall TaToM Development

### 3.1 Present Situation of Overall TaToM Area

#### 3.1.1 Areas Covered by Overall TaToM Area

The whole area of TaToM (the Overall TaToM Area) is composed of Antananarivo Agglomeration, Toamasina Agglomeration and TaToM Economic Axis connecting the two agglomerations.



Source: JICA Study Team

Figure 3.1.1 Location of Overall TaToM Area

#### 3.1.2 Socio-economy of Overall TaToM Area

##### (1) Population of Overall TaToM Area

A total of 29.4% of Madagascar's national population was concentrated in Antananarivo Province in 1993. In a span of 25 years, the population in other provinces increased rapidly while the population concentration in Antananarivo Province eased slightly to a total of 28.2% of the national population in 2018. However, this population concentration in Antananarivo Province was still the

highest out of the six provinces of Madagascar. The population density of Antananarivo Province was also the highest at 124.65 person/km<sup>2</sup> as of 2018 based on the provisional result of last census figure which was three times higher than the national population density.

On the other hand, the least populated province was Antsiranana Province located in the north of the country with around 8.0% of the 2018 national population.

Mahajanga Province and Toliary Province were the provinces with low population density with approximately 25 persons/km<sup>2</sup> as of 2018, or about half of the national density. These two provinces are located in the eastern side of the country.

**Table 3.1.1 Trend of Population by Province**

Autonomous Province	Population			Annual Population Growth Rate		Area <sup>1</sup> (km <sup>2</sup> )	Density 2018 (person /km <sup>2</sup> )
	1975 <sup>1</sup> (Census)	1993 <sup>2</sup> (Census)	2018 <sup>3</sup> (Census Provisional Result)	1975-93	1993-2018		
Antananarivo	2,167,973	3,601,127	7,264,922	2.86%	2.85%	58,283	124.65
Fianarantsoa	1,804,365	2,550,190	5,162,291	1.94%	2.86%	102,373	50.43
Toamasina	1,179,606	1,995,461	3,892,262	2.96%	2.71%	71,911	54.13
Mahajanga	819,750	1,364,793	3,135,764	2.87%	3.38%	150,023	20.90
Toliary	1,034,114	1,772,610	4,212,354	3.04%	3.52%	161,405	26.10
Antsiranana	580,000	954,733	2,066,749	2.81%	3.14%	43,046	48.01
Madagascar	7,585,808	12,238,914	25,734,342	2.69%	3.02%	587,041	43.84

Source 1: Institut national de la statistique et de la recherche économique, Recensement General de la Population et des Habitats 1975

Source 2: Direction Generale de l'Institut National de la Statistique, Recensement General de la Population et de l'Habitats 1993

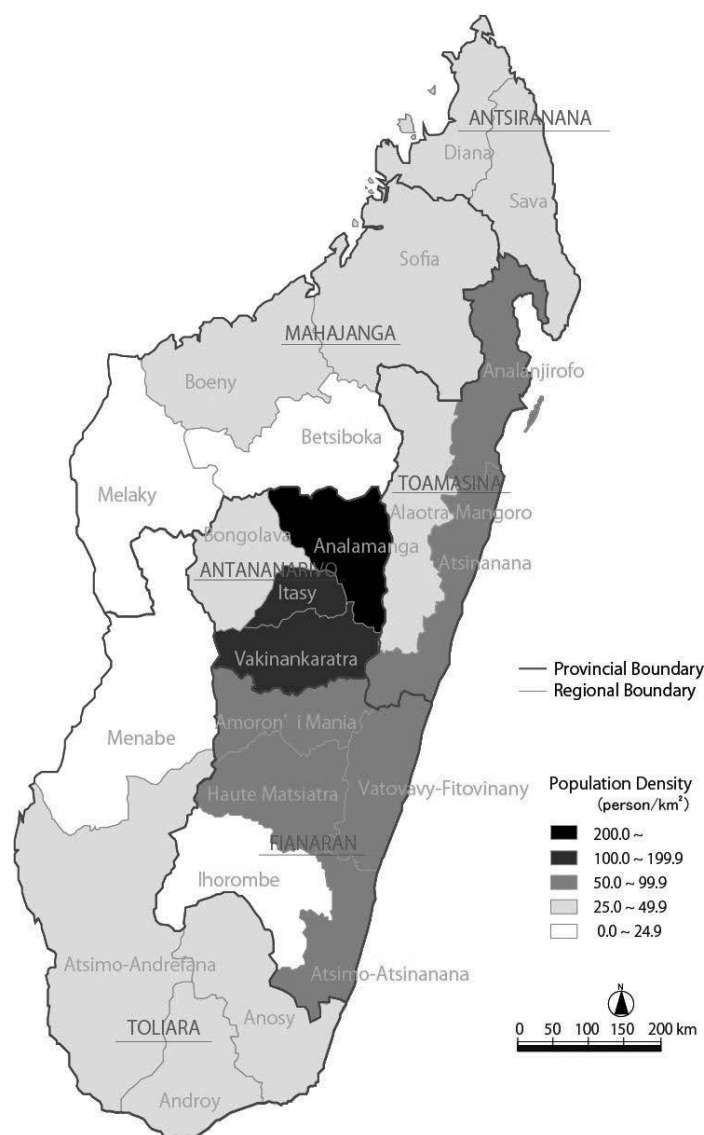
Source 3: INSTAT, 2019, Troisieme Recensement General de la Population et de l'Habitats Resultats Provisoires

Looking at the population by region, Analamanga Region where the national capital Antananarivo is located has the highest share of population in Madagascar followed by Vakinankarata Region where Antsirabe is located. The population density by region is shown in Figure 3.1.2.

**Table 3.1.2 Present Population by Regional in Madagascar**

Province	Region	Population		Annual Population Growth Rate	Share of Population to National Population
		1993 Census	2018 Provisional Census Result	1993-2018	2018
Antananarivo	<b>Analamanga</b>	<b>1,758,927</b>	<b>3,618,128</b>	<b>2.93%</b>	<b>14.1%</b>
	Bongolava	235,089	674,474	4.31%	2.6%
	Itasy	462,796	897,962	2.69%	3.5%
	Vakinankaratra	1,144,316	2,074,358	2.41%	8.1%
Fianarantsoa	Atsimo-Atsinanana	424,765	1,026,674	3.59%	4.0%
	Amoron'i Mania	473,801	833,919	2.29%	3.2%
	Ihorombe	129,443	418,520	4.81%	1.6%
	Haute Matsiatra	771,714	1,447,296	2.55%	5.6%
Toamasina	Vatovavy-Fitovinany	748,468	1,435,882	2.64%	5.6%
	<b>Atsinanana</b>	<b>780,484</b>	<b>1,484,403</b>	<b>2.60%</b>	<b>5.8%</b>
	<b>Alaotra-Mangoro</b>	<b>613,411</b>	<b>1,255,514</b>	<b>2.91%</b>	<b>4.9%</b>
	Analanjirifo	601,567	1,152,345	2.63%	4.5%
Mahajanga	Betsiboka	170,175	394,561	3.42%	1.5%
	Boeny	391,066	931,171	3.77%	3.6%
	Melaky	126,355	309,805	3.00%	1.2%
	Sofia	677,197	1,500,227	3.23%	5.8%
Toliara	Androy	347,520	903,376	3.90%	3.5%
	Atsimo-Andrefana	743,107	1,799,088	3.60%	7.0%
	Anosy	396,959	809,313	2.89%	3.1%
	Menabe	285,125	700,577	3.66%	2.7%
Antsiranana	Diana	359,227	889,736	3.69%	3.5%
	Sava	595,506	1,177,013	2.76%	4.6%
Madagascar		12,237,018	25,734,342	3.02%	100.0%
Total Population of 3 Regions Covering Overall TaToM Area		3,152,822	6,358,045	2.85%	24.7%

Source: INSTAT



Source: INSTAT

**Figure 3.1.2 Population Density by Region in Madagascar (2018)**

The total population of the three regions Overall TaToM Area in 2018 is approximately 6.4 million, which is 24.7% of the national population.

## (2) GRDP of Overall TaToM Area

The share of GRDP to national GDP and the share of each economic sector in three regions, which are based on the data of National Statistics Institute (INSTAT) estimated in June 2018, is shown in Table 3.1.3. The total GRDP of these three regions contributes to more than half of the national GDP.

**Table 3.1.3 Share of Overall TaToM Area's GRDP to National GDP (2014)**

(GDP at Factor Cost, MGA Billion at current prices)

Region	Primary Sector		Secondary Sector		Tertiary Sector		Total	Share
Analamanga	484	6.0%	2,274	57.8%	9,116	55.2%	11,874	41.7%
Atsinanana	381	4.7%	559	14.2%	1,044	6.3%	1,984	7.0%
Alaotra-Mangoro	281	3.5%	226	5.7%	456	2.8%	963	3.4%
Others	6,911	85.8%	876	22.3%	5,896	35.7%	13,683	47.9%
Total	8,057	100.0%	3,935	100.0%	16,512	100.0%	28,504	100.0%

Note: National GDP in 2014 at 2007 constant prices amounts to MGA 17,368 billion.

Source: JICA Study Team based on National Statistics Institute (INSTAT) (June, 2018)

### 3.1.3 Geological Conditions of Overall TaToM Area

The three regions of Overall TaToM Area lie within the two geological zones of Madagascar, which are the east coast area and the central highlands area.

The east coast area consists of a narrow band of lowlands and an intermediate zone composed of steep bluffs with valleys giving access to the central highlands. The east coast also has Pangalanes Canal (Canal des Pangalanes), which is a 645-kilometre-long lagoon running down the east coast of Madagascar from Mahavelona to Farafangana.

The central highlands area, which range from 800 to 1,800 m in altitude, contain a wide variety of topographies: rounded and eroded hills, massive granite outcrops, extinct volcanoes, eroded peneplains, and alluvial plains and marshes, which have been converted into irrigated rice fields. The central highlands extend from the Tsaratanana Massif in the north to the Ivakoany Massif in the south. They are defined rather clearly by the escarpments along the east coast, and they slope gently to the west coast. The central highlands include the Anjafy High Plateaux; the volcanic formations of Itaosy (Lake Itaosy is in a volcanic crater) and the Ankaratra Massif, reaching a height of 2,643 m. The Isalo Roiniforme Massif lies between the central highlands and the west coast.

## 3.2 Regional Spatial Frameworks for the Overall TaToM Area

### 3.2.1 The Overall TaToM Area and Growth Areas of National Land Use Plan (SNAT)

#### (1) National Land Use Plan (SNAT)

The National Land Use Plan (SNAT: *Schéma national de l'aménagement du territoire*) is a reference framework for the coordination of territorial actions for a rational and harmonious management of space. It is an integrating tool of strategic documents from all sectors (policies, programs, plans or schemes) but also cartographic documents presenting a prospective vision of the territory

In order to achieve territorial efficiency, the SNAT as a tool for coordination, planning and programming represents a key priority for ensuring territorial integration.

The SNAT is therefore used for the following purposes:

- To present a coherent vision of territorial development, placing immediate options in a long-term perspective
- To bring the perspectives of different sectors (in time and space)
- To propose a framework for the harmonization of interventions

The SNAT (2015-2025) was developed to realize sustainable and economical management of space. It takes into account the complementarities of the regions, the objectives of major and current national programs and future projects, as well as the necessary reframing for sub-regional integration.

#### (2) 12 Growth Areas in SNAT 2015-2025

The SNAT defines 12 growth areas, which will serve as levers of development and push for coherence, synergy and coordination between different public, sectoral and transversal programmes. These 12 growth areas identified are listed below.

- 1-E: Growth Area driven by PIC de Taolangnaro (export)
- 2-AA: Growth Area driven by PIC d'Antsirabe (food industry)
- 3-TE: Growth Area driven by PIC de Nosy Be (tourism & export)
- 4-M\*E: Growth Area polarized by Toamasina (import & export)

- 5-HET: Growth Area polarized by hydro-agricultural development of Lac Alaotra (agriculture)
- 6-LD: Growth Area polarized by Finarantsoa (local development)
- 7-T: Growth Area Structure by RN7 (tourism)
- 8-Met: Growth Area of Metropolitan (metropole)
- 9-BV: Growth Area of Betsiboka Basin (Watershed of the country's hydroelectric potential)
- 10-A: Growth Area: National-regional Area in Menabe (Agriculture)
- 11-MTA: Growth Area polarized by Atsimo Andrefana (tourism, agriculture, and mining)
- 12-EM: Growth Area of Maritime (fishery, transport, and energy)

The first three growth areas are based on PIC (*Poles Integres de Croissance*), which are integrated growth poles identified and financed by the World Bank.

Antananarivo is included in 2-AA and 8-Met, while Toamasina is included in 4-M\*E.



Source: JICA Study Team based on Schema National d'Amenagement du Territoire (SNAT), Scheme National des Orientations Sectorielles et Transversales (SNOST) 2015-2025

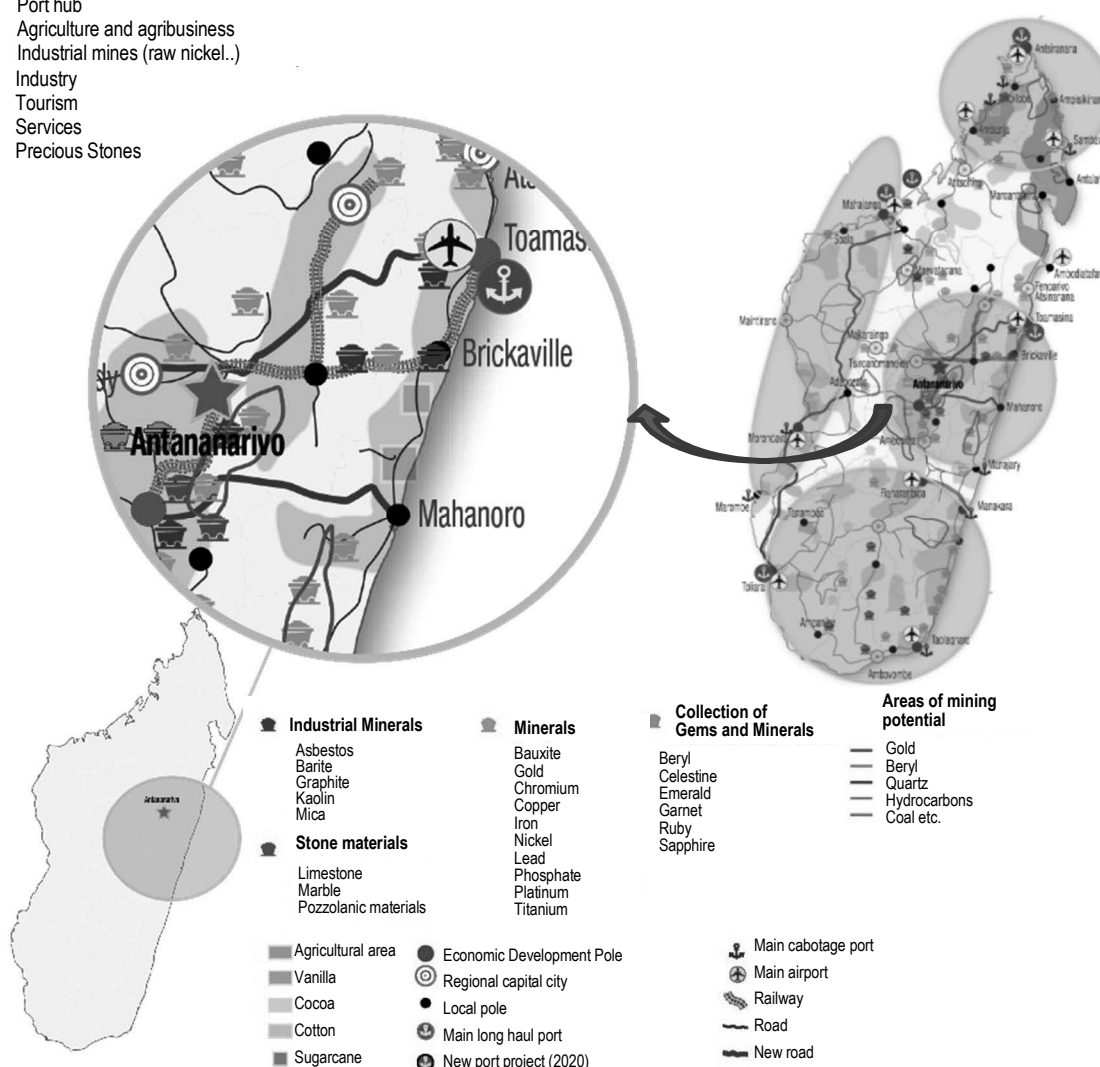
Figure 3.2.1 Twelve Growth Areas Identified by SNAT

### 3.2.2 Overall TaToM Area and Growth Poles of Vision 2030

The growth areas designated in the PND are elaborated into the growth poles in the Vision 2030. Four growth poles of Grand-Central, Grand-North, Grand-South, and Grand-West are expected to emerge by 2030, in accordance with opportunities and distinctive characteristics of the regions. The TaToM Area (Antananarivo Agglomeration, Toamasina Agglomeration and the Economic Axis) is an important part of the Grand-Central Pole as an integrated economic centre, while Antsirabe is also part of the Grand-Central Pole. The leading economic sectors are industry (agro-processing industry, textile industry, mining and gems) and services (tourism). Five key projects to transform the growth pole have already been formulated, namely: 1) Antananarivo-Toamasina Highway to link Antananarivo to the port of Toamasina in 3 hours, 2) rehabilitation of the Antsirabe-Antananarivo-Tamatave North Railway, 3) dredging of the Pangalanes Canal for 24-hour operation, 4) Antsirabe-Mahanoro Road, and 5) expansion of Toamasina Port. In addition, a new modern cargo airport is proposed in Toamasina for the export of the agro-processing industrial products.

#### GRAND CENTRE

Port hub  
 Agriculture and agribusiness  
 Industrial mines (raw nickel..)  
 Industry  
 Tourism  
 Services  
 Precious Stones



Source: Fisandratana 2030, Une Vision Pour L'Émergence et la Renaissance de Madagascar

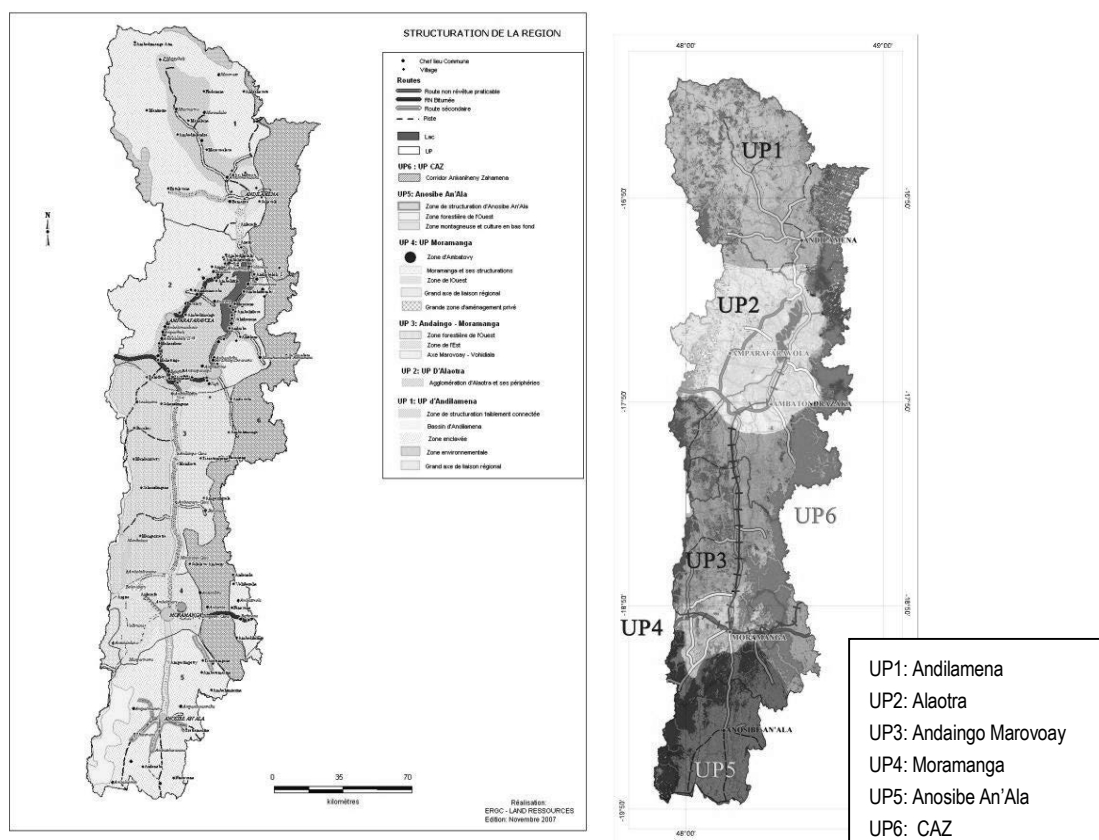
**Figure 3.2.2 Grand-Centre Growth Pole and Four Growth Poles**

In the plan, Antananarivo and Toamasina are proposed to be a service centre and a logistics and industrial city, respectively. Antsirabe is a growth pole for agribusiness. In Antananarivo, various service sectors will be developed, such as tourism, financial services, corporate and corporate

headquarters, administration, and training, and host medium-high-end residence and luxury hotels, with open spaces, high-end shopping centers, amusement and leisure facilities, culture and art centers, high-speed Internet, good quality of hospitals, and other amenities. On the other hand, Toamasina will attract senior experts and professionals, some of whom will be migrated from Antananarivo.

### 3.2.3 Regional Land Use Plan for Alaotra-Mangoro Region

The Regional Land Use Plan (SRAT: *Schéma Régional de l'Aménagement du territoire*) of Alaotra-Mangoro, prepared in July 2008, illustrates its 20-year perspective based on present situational analysis, including geography, demography, economy, environment, infrastructure, social infrastructure, and land resources. Prospecting units (UP) are designated as shown in the figure below.



Source: SRAT Alaotra Mangoro, Rapport de Prospects Régionales, July 2008.

Figure 3.2.3 Regional Structure and Prospecting Units

### 3.2.4 Regional Development Plan for Analamanga Region

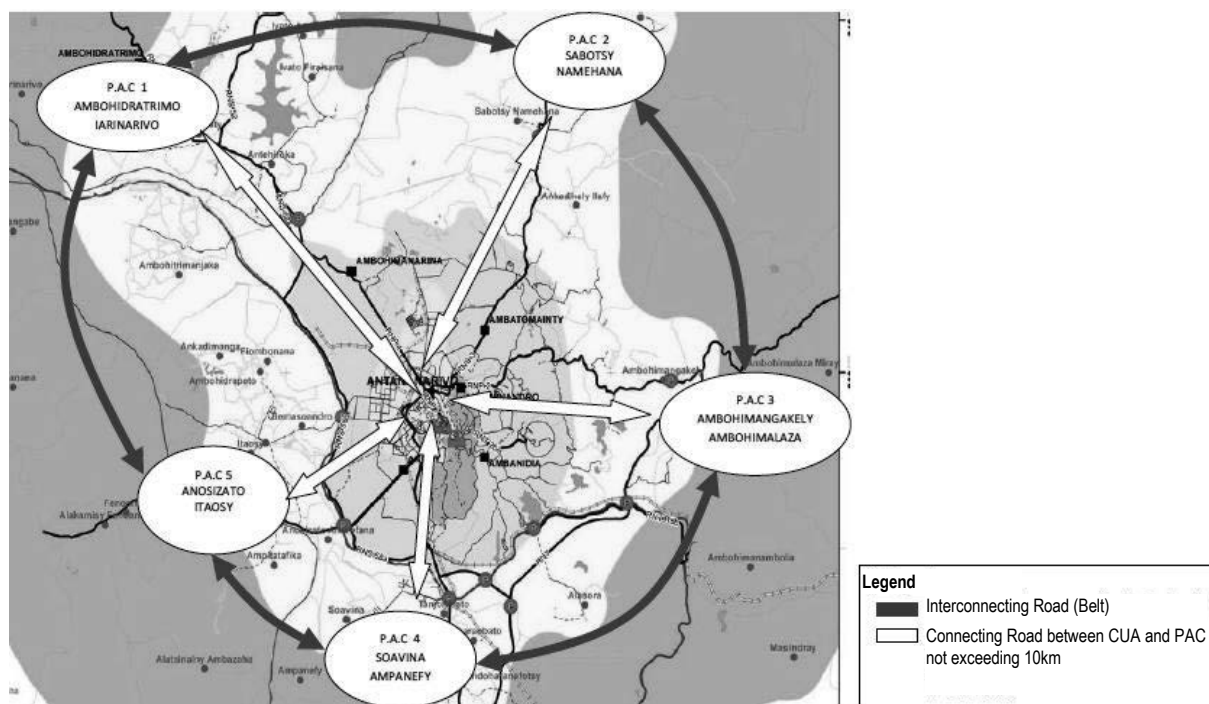
Although Regional Development Plan (PRD: *Plan Régional de Développement*) is not a spatial plan, Analamanga Region's Regional Development Plan designates the following five complex activity poles to be developed within Antananarivo Agglomeration: 1. Ambohidratrimo Iarinarivo, 2. Sabotsy Namehana, 3. Ambohimangakely Ambohimalaza, 4. Soavina Ampanefy and 5. Anosizato Itaosy

It also suggests the following construction projects for Antananarivo Agglomeration:

- Construction of a subway on the axis linking Ankadilalana-Tanjombato Bridge (apparent from CEMES Soanierana to Tanjombato Bridge);
- Construction of a flyover bridge at the roundabout Anosizato
- Construction of a flyover bridge at the roundabout Ampasika

- Construction of a tramway on the axis linking the Soarano Station - Ankazomanga - Ambohimananarina
- Construction of a subway on the axis linking Avaradoha- Ampasampito - Mahazo
- Construction of a subway on the axis linking Ambohibao - Ivato Airport

This plan is in line with the five strategic focus areas defined in the PND and the General State Policy.



Source: Ministry of Interior and Decentralization, 2011, PRD Analamanga Region

**Figure 3.2.4 Location of Complex Activity Poles in Antananarivo Agglomeration**

### 3.2.5 Regional Development Plan for Atsinanana Region

Development Poles and Social Poles are also determined in the PRD for Atsinanana Region. The communes of Toamasina I, Toamasina II, Brickaville, Vatomandry and Mahanoro are development poles, while the communes of Marolambo and Antanambao Manampontsy are social poles.

## 3.3 Development Potentials and Constraints for Economic Sectors of the Overall TaToM Area

### 3.3.1 SWOT Analyses of Antananarivo Agglomeration, Toamasina Agglomeration and TaToM Economic Axis

SWOT analyses for Antananarivo Agglomeration, Toamasina Agglomeration, and TaToM Economic Axis were conducted in order to see the possibilities to attract investments to economic sectors and to manage the development of economic sectors of the agglomerations and the economic axis, as shown in Table 3.3.1, Table 3.3.2 and Table 3.3.3.



**Table 3.3.1 SWOT Analysis for Antananarivo Agglomeration**

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>Antananarivo Agglomeration has better infrastructure and economic conditions compared with other areas, and population is continuously increasing.</li> <li>As a result, a large amount of cheap labour force exists in Antananarivo Agglomeration.</li> <li>The labour force is hard working and good with hands. Such labour force does not exist much in other countries of Africa.</li> <li>An export-oriented industry (textile industry) already exists. It is incorporated in the global value chain of textile industry.</li> <li>Madagascar is a world famous destination of international tourism because of its rare animals and plants. Antananarivo is one of the gateways of the country for international tourists.</li> </ul>	<ul style="list-style-type: none"> <li>Fuel transport supporting economic and social activities in Antananarivo Agglomeration is unstable due to Antananarivo's inland location and its large distance (350 km) to seaports.</li> <li>The school education system has been degraded to the point that it is not functioning properly so that students cannot acquire basic academic skills. As a result, the basic academic skills of young people are lacking at present.</li> <li>The condition of economic infrastructure development (such as those for power supply, water supply and access roads) is poor. As a result, it is difficult to attract investments to economic sectors. Development of the economic sectors is not well promoted.</li> <li>Although government funds for infrastructure development have been spent more for Antananarivo Agglomeration than other regions, they were largely lacking compared with the necessary amount.</li> <li>Administrative capacity on promotion of agriculture and industries is weak for Analamanga Region, including Antananarivo Agglomeration.</li> <li>Drainage infrastructure are not well maintained resulting to increased inundation risks in urban areas of Antananarivo Agglomeration.</li> <li>Night soil is not properly treated and disposed. Hygiene is a problem in urban areas of Antananarivo Agglomeration.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>Madagascar is a member of SADC, COMESA and IORA, as well as AfCFTA. By promoting the regional economic integration related to these organisations, it is possible to access the regional markets with high growth potential by developing economic sectors targeting those regional consumer markets.</li> <li>With expansion of Toamasina Port, world largest container vessels will be able to stop at the Toamasina Port for trans-shipment (like Port Luis in Mauritius). Feeder ships will sail from Toamasina Port to ports in the eastern and southern Africa. As a result, access by cargo ships from Madagascar to markets of countries in the Indian Ocean and African Continent will become easier, the cost of transport to those countries will be reduced and the possibility of promoting economic sectors targeting regional consumer markets will increase.</li> <li>Wages of workers in China and Southeast Asia are gradually increasing. South Asia still has cheap, abundant labour force but does not have the production capacity like China. There are not many countries that can take over low-cost manufacturing after China, but Madagascar is one of the possible countries.</li> </ul>	<ul style="list-style-type: none"> <li>Investments to economic sectors are not promoted because of the repeated political crises and prolonged economic instability. Due to political crises, ODA might be cut off so that economic infrastructure development could be disrupted.</li> <li>There is a possibility that the regional economic integration will not be implemented as expected even with the institutionalisation of the regional economic integration of COMESA, SADC, and IORA as well as that of AfCFTA.</li> <li>Even if the regional economic integration progresses, economic sector development in Madagascar will not be realised because of the influx of competitive regional products from South Africa and other countries of the region.</li> <li>The cargo transport function between Antananarivo and Toamasina Port will be maintained but, for some reasons, not upgraded to accommodate an increasing amount of transport demand. As a result, it will be difficult for Antananarivo Agglomeration to import fuel and commodities for supporting people's needs and economic production.</li> </ul>

Source: JICA Study Team

**Table 3.3.2 SWOT Analysis of Toamasina Agglomeration**

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>The most important port of Madagascar, Toamasina Port, is located in Toamasina Agglomeration.</li> <li>Toamasina Agglomeration is the second largest city in Madagascar in terms of population size.</li> <li>Ambatovy's nickel and cobalt refining plant is located in Toamasina Agglomeration.</li> <li>Toamasina Port is a destination of regular international cruise ships. Toamasina Agglomeration has tropical climate and beaches.</li> </ul>	<ul style="list-style-type: none"> <li>The school education system has been degraded to the point that it is not functioning properly so that students cannot acquire basic academic skills. As a result, the basic academic skills of young people are lacking at present.</li> <li>The condition of economic infrastructure development (such as those for power supply, water supply and access roads) is poor. As a result, it is difficult to attract investments to economic sectors. Development of the economic sectors is not well promoted.</li> <li>Tourist infrastructure, such as hotels, are limited to attract international tourists in Toamasina Agglomeration.</li> <li>Government funds for infrastructure development are largely lacking.</li> <li>Regional and local administrative capacity on industrial development is weak for Atsinanana Region, including Toamasina. The policy of the central government on the industrial development in Toamasina Agglomeration is also weak.</li> <li>Drainage infrastructure are not well maintained resulting to frequent inundation in urban areas of Toamasina Agglomeration.</li> <li>Night soil is not properly treated and disposed. Hygiene is a problem in Toamasina Agglomeration.</li> </ul>

	<ul style="list-style-type: none"> <li>• Management reform of Air Madagascar has been in progress. Due to the difficult reform process of Air Madagascar, cities in Madagascar are currently not connected effectively by airline flights. Flights between Antananarivo and Toamasina tend to be delayed or cancelled. As a result, putting in investments to economic sectors in Toamasina Agglomeration has not been so attractive.</li> <li>• Vertical and horizontal alignments of National Road No.2, connecting Antananarivo and Toamasina, are not good because said road passes through mountainous areas. Therefore, cars cannot be driven fast on NR2. Connectivity between Antananarivo and Toamasina is weak, which creates an unfavourable condition for investments to economic sectors in Toamasina Agglomeration.</li> <li>• Toamasina Agglomeration is currently not economically active and it is not a comfortable place for people to work and live in. As a result, population inflow to Toamasina Agglomeration is low.</li> <li>• Madagascar has cheap, abundant labour force who are hard workers and good with hands. However, the labour force exists in Antananarivo and Antsirabe which are inland areas. Therefore, it is necessary to bring the labour force from those inland cities to Toamasina Agglomeration in order to develop economic sectors in Toamasina Agglomeration.</li> <li>• An export-oriented industry (textile industry) already exists in Madagascar. It is incorporated in the global value chain of textile industry. However, such industry is located in inland urban areas, such as Antananarivo and Antsirabe.</li> <li>• Madagascar has rare flora and fauna and it is a world famous destination for international tourists. However, the major gateway to Madagascar is Antananarivo. Toamasina is not considered as one of the major gateways for international tourists.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Toamasina Agglomeration is located near the Port of Toamasina, a deep sea port. It is close to the markets of regional countries in the Indian Ocean and Africa, and strategically advantageous in promoting manufacturing industry targeting those consumer markets.</li> <li>• Madagascar is a member of SADC, COMESA and IORA, as well as AfCFTA. By promoting the regional economic integration related to these organisations, it is possible to access the regional markets with high growth potential by developing economic sectors targeting the regional consumer markets.</li> <li>• With expansion of Toamasina Port, world largest container vessels will be able to stop at the Toamasina Port for trans-shipment (like Port Luis in Mauritius) and feeder ships will sail from Toamasina Port to ports in the eastern and southern Africa. As a result, access by cargo ships from Toamasina to markets of countries in the Indian Ocean and African Continent will become easier, the cost of transport to these countries will be reduced and the possibility of promoting economic sectors targeting regional markets will increase.</li> <li>• Wages of workers in China and Southeast Asia are gradually increasing. South Asia still has cheap, abundant labour force but does not have the production capacity like China. There are not many countries that can take over low-cost manufacturing after China, but Madagascar could be one of these countries. Strategically, Toamasina Agglomeration has the advantage due to its location close to the Toamasina Port.</li> <li>• With the development of Pangalanes Canal, agricultural production targeting world markets could increase in areas along the canal. There is a possibility to develop processing industry using part of the agricultural products.</li> </ul>	<ul style="list-style-type: none"> <li>• Investments to economic sectors are not promoted because of repeated political crises and prolonged economic instability. ODA might be cut off, so that economic infrastructure development could be disrupted.</li> <li>• There is a possibility that more fund for infrastructure development will be used intensively for Antananarivo Agglomeration, and not for Toamasina Agglomeration, because of political reasons and development policies</li> <li>• There is a possibility that the regional economic integration will not be implemented as expected, even with the institutionalisation of the regional economic integration of COMESA, SADC, and IORA, as well as that of AfCFTA.</li> <li>• Even if the regional economic integration progresses, economic sector development in Madagascar will not be realised because of the influx of competitive regional products from South Africa and other countries of the region.</li> </ul>

Source: JICA Study Team

**Table 3.3.3 SWOT Analysis of TaToM Economic Axis**

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• The transport function of TaToM Economic Axis is indispensable for importing fuel and other necessary commodities for everyday life and also for importing commodities for economic production in Antananarivo Agglomeration. Because of its high degree of necessity, NR2 is always maintained.</li> </ul>	<ul style="list-style-type: none"> <li>• Although NR2 and railway between Antananarivo and Toamasina composed an essential transport corridor for Madagascar, the traffic volume of NR2 was limited to around 1,700 vehicles per day (2018) and the cargo volume of the railway was around 96,000 ton per year (2017).</li> </ul>

<ul style="list-style-type: none"> <li>• Cities and local communities along NR2 have some chances to do small business on trade and car repairing because of the traffic of heavy truck vehicles, taxi-brousses and passenger cars on NR2 connecting Antananarivo and Toamasina.</li> <li>• Since Moramanga is located in the middle of Antananarivo and Toamasina, many heavy truck vehicles take a stop here to rest.</li> <li>• Moramanga area has tree plantations and natural forests for timber production.</li> <li>• Ambatoby mining site of nickel and cobalt is located near Moramanga.</li> <li>• Moramanga is a junction between NR2 and NR44. NR44 connects with Alaotora Lake Area, which is a good rice-producing area.</li> </ul>	<ul style="list-style-type: none"> <li>• The government continuously conducts road maintenance for NR2. However, this is just for maintaining the existing road function and capacity of NR2; not for upgrading of the road function and capacity of NR2. Therefore, the cargo transport costs between Toamasina Port and Antananarivo Agglomeration (and farther other inland regions) remain high. The cargo transport time is also large (over 12 hours).</li> <li>• The horizontal and vertical alignments of NR2 are so bad that it is very costly to improve the horizontal and vertical alignments for the purpose of increasing transport volume and travel speed on it.</li> <li>• The road traffic safety is problematic for both heavy trucks and passenger vehicles on NR2. Traffic accidents also involve people in communities along NR2.</li> <li>• The resilience against heavy rainfall due to cyclones of NR2 is not so strong, considering that it is the national major axis connecting the national capital (Antananarivo) and the national main port (Toamasina).</li> <li>• The railway infrastructure has been degraded due to heavy rainfall and shortage of maintenance and rehabilitation budgets.</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Since the Overall TaToM Area produces around 50% of the national total of GDP, this area will continue to attract more population and economic activities. As a result, the traffic demand for TaToM Economic Axis will increase steadily. For supporting the most important national axis, the upgrading of transport function of TaToM Economic Axis will become necessary sooner or later.</li> <li>• It will be possible to further develop economic sectors of Antananarivo and Toamasina Agglomerations by targeting regional consumer markets of SADC, COMESA and IORA, as well as that of AfCTFC. When Antananarivo and Toamasina Agglomerations develop their economic sectors, the traffic demand for TaToM Economic Axis will largely increase. Then it will be possible to upgrade the transport function of TaToM Economic Axis to support further development of economic sectors of Antananarivo and Toamasina Agglomerations.</li> <li>• This possibility of development by economic sectors in Antananarivo and Toamasina Agglomeration, as well as in Moramanga and other towns along TaToM Economic Axis, will be enhanced by the prospective expansion of Toamasina Port. The necessity of upgrading the transport function of TaToM Economic Axis will become larger also due to the expansion of Toamasina Port.</li> <li>• A new power substation will be constructed in Moramanga in order to connect a power transmission line between Antananarivo and Toamasina. Then the increased power supply will be available in Moramanga. Because of the relative proximity to Toamasina Port and the availability of improved power, Moramanga will be able to attract investments to its economic sectors.</li> </ul>	<ul style="list-style-type: none"> <li>• There is a possibility that enough fund will not be spent for upgrading of NR2 and rehabilitation of the railway between Antananarivo and Toamasina.</li> <li>• One of the reasons is repeated political crises and prolonged economic instability. Because of this situation, investments to economic sectors will not be promoted in Antananarivo and Toamasina Agglomerations, and ODA might be cut off, so that transport infrastructure development will be disrupted including those for NR2 and railway.</li> <li>• Another reason could be the early construction of Antananarivo-Toamasina Expressway in the next 5-10 years. In the next 5-10 years, the traffic demand for the expressway will not be large enough to support the repayment of the borrowed money for its construction. This could lead to large increase of international debt of Madagascar.</li> <li>• As a result, due to shortage of development fund, many priority projects of TaToM will not be implemented. This situation will lead to limited development of economic sectors both of Antananarivo and Toamasina Agglomeration.</li> <li>• The regional economic integration will not be implemented as expected, even with the institutionalisation of the regional economic integration of COMESA, SADC, and IORA, as well as that of AfCFTA. This situation will not bring the possibility of development of economic sectors in Antananarivo and Toamasina Agglomerations. As a result, traffic demand for TaToM Economic Axis will not largely increase, and it will not be able to upgrade its transport function.</li> <li>• Even if the regional economic integration progresses, economic sector development in Madagascar will not be realised because of the influx of competitive regional products from South Africa and other countries of the region. This situation will result in low-level development of economic sectors in Antananarivo and Toamasina Agglomerations. As a result, traffic demand for TaToM Economic Axis will not largely increase, and it will not be able to upgrade its transport function.</li> </ul>

Source: JICA Study Team

### 3.3.2 General Directions of Development of Economic Sectors in the Overall TaToM Area

#### (1) Economic Sector Development in Antananarivo Agglomeration

- Antananarivo Agglomeration has been the centre of economic sectors in urban areas of Madagascar. GRDP of Analamanga Region, where Antananarivo Agglomeration is located, accounted for 41.7 % of the national GDP in 2014. On the other hand, the proportion of the population of Analamanga Region to the national population is 15.3%. That is, GRDP per capita of Analamanga Region is 2.7 times larger than the national average. Therefore, it is expected that Antananarivo Agglomeration will produce a significantly increasing volume of GRDP in the future.

- More than half of the manufacturing industries in Madagascar are located in Antananarivo Agglomeration, among which the export-oriented textile and agro-processing industries that are driving the economy of Madagascar.
- In Antananarivo Agglomeration, low cost and abundant labour force exists and the condition of infrastructure is relatively good compared with other cities in Madagascar. The existing power plant was renovated by PAGOSE Project and the construction of new hydroelectric power plants is planned. Although there are problems on water supply, rehabilitation and construction of water treatment plants are expected in the future.
- Madagascar is a member of regional economic communities in Africa and in the Indian Ocean. Large-scale regional markets are emerging by forming free trade areas based on the regional economic communities. Antananarivo Agglomeration has potential of developing economic sectors targeting the regional consumer markets, especially in light industries of manufacturing daily use products for middle-income population in the region, in addition to textile and agro-processing industries.
- The disadvantage of Antananarivo Agglomeration is that it is 350 kilometres away from Toamasina Port, hence the high transport costs and large transport time between Antananarivo and Toamasina.

## **(2) Economic Sector Development in Toamasina Agglomeration**

- Even with the advantage of its location close to Toamasina Port, economic sectors in Toamasina Agglomeration have not been developed much, except for Ambatoby's nickel and cobalt refining plant, some industries of packaging and exports of agricultural products and agro-processing industries. The GRDP of Atsinanana Region, where Toamasina Agglomeration is located, accounts for only 7 % of the national GDP. GRDP per capita of Atsinanana Region is 1.2 times larger than the national average, since the proportion of the population of Atsinanana Region to the national population is 5.8%.
- The construction of Volobe II Hydroelectric Power Plant is being planned by IPP (Independent Power Producer), supplying power to both Antananarivo and Toamasina Agglomerations by 2024.
- Expansion of Toamasina Port will be completed in 2028. With the expansion of Toamasina Port, it is expected that the number of large container vessels stopping at the Toamasina Port for trans-shipment will increase, and access from Toamasina by feeder ships to eastern and southern Africa will improve.
- With these conditions, it is expected that investments to agro-processing and light industries targeting regional markets come in at Toamasina Agglomeration when some more infrastructure is provided for industrial development, as well as when residential environment is improved.
- In addition to the improvement of economic infrastructure, the National Road No. 2 (NR2) between Antananarivo and Toamasina should be improved. Passenger transport on NR2 takes eight hours, traveling is not safe and the road is not resilient enough because of high risk to landslides caused by heavy rains.
- More importantly, the condition required for attracting investments to economic sectors in Toamasina Agglomeration is the speed of passenger transport between Antananarivo and Toamasina. This is because investors, decision makers and operation managers have to come from Antananarivo Agglomeration to Toamasina Agglomeration through TaToM Economic Axis. It is essential to improve the speed of road transport, in addition to the improvement of

reliability of air transport. The air transport is expected to be improved by the on-going management reform of Air Madagascar under World Bank assistance.

### **(3) Expectations of Economic Sectors from the Transportation System of TaToM Economic Axis**

There are different expectations from the transportation system of TaToM Economic Axis.

Antananarivo and Toamasina Agglomerations expect growth scenarios from the TaToM Economic Axis (Transport corridor between Antananarivo and Toamasina) that differ from each other. These are as follows:

#### **1) Expectations of Economic Sectors in Antananarivo Agglomeration from the Transportation System of the TaToM Economic Axis**

- It is necessary to strengthen the transport of basic materials (fuel, industrial raw materials and intermediate goods) and consumable goods from Toamasina Port to Antananarivo Agglomeration for the activities of economic sectors and everyday life of residents.
- It is required to improve cargo transport between Toamasina Port and Antananarivo Agglomeration on these priorities: firstly, traffic security and resilience; secondly, capacity; and thirdly, speed.
- Good conditions of traffic security and resilience are essential for transportation towards development of economic sectors in Antananarivo Agglomeration.
- To secure a sufficient capacity of cargo transport between Antananarivo and Toamasina is more important than improving transport speed for the development of economic sectors in Antananarivo Agglomeration. At present, it takes 12 hours for heavy trucks to travel from Toamasina Port to Antananarivo and they have to stop overnight somewhere on NR2 for safe travel. Since the horizontal and vertical alignments of NR2 are too bad to improve them so as to increase transport capacity, it will be necessary to rehabilitate the railway between Antananarivo and Toamasina for the purpose of increasing the total transport capacity of TaToM Economic Axis. In the long term it will be necessary to construct a high-standard expressway of four lanes for attaining a larger volume of transport capacity.

#### **2) Expectations of Economic Sectors in Toamasina Agglomeration from the Transportation System of the TaToM Economic Axis**

- It is necessary to prepare the environment enabling efficient management of business/ industrial operation by improving the speed of passenger transport between Toamasina and Antananarivo Agglomerations. This is because corporate executives, business operation managers and engineers need to travel from Antananarivo to Toamasina in order to monitor and make decisions on productive operation.
- Since international investors come to Antananarivo first and domestic companies' decision makers and managers stay in Antananarivo, business and industrial operations in Toamasina Agglomeration should be monitored by their visit from Antananarivo to Toamasina. Also, it should be considered that Toamasina-based managers and technical officers need to come to Antananarivo for reporting Toamasina operation situations to their headquarters in Antananarivo.
- In order to attract investments and develop the economic sectors in Toamasina Agglomeration, it is required to improve passenger transport between Toamasina and Antananarivo Agglomerations considering: firstly, traffic security and resilience; secondly, speed especially of passenger transport; and thirdly, the transport capacity of both passengers and cargo.

### **3.4 Future Vision for the Overall TaToM Area**

#### **3.4.1 Expected Roles of the Overall TaToM Area**

The TaToM Area has two kinds of expected roles and functions. The one role is the economic production in the TaToM Area including Antananarivo Agglomeration, Toamasina Agglomeration and Moramanga and other towns in the TaToM Economic Axis. The other is the transport function. It is not only the corridor transport function of the TaToM Economic Axis connecting Antananarivo and Toamasina, but also the transport function of connecting the two agglomerations with their surrounding areas.

##### **(1) Expected Roles of Economic Production in the Overall TaToM Area**

The Overall TaToM Area produced nearly 50 % of the total GDP of Madagascar in 2014, while the population of the TaToM Area accounts for 21% of the total national population of Madagascar. The GDP per capita of the TaToM Area is estimated to be around 2.3 times higher than the national average.

Antananarivo Agglomeration has relatively well developed infrastructure and low-cost abundant labour force in comparison with other regions in Madagascar. On the other hand, Toamasina Agglomeration has a deep sea port, which handles the largest volume of cargo in Madagascar, and which is to be expanded in its cargo handling capacity. Therefore, the two agglomerations are expected to attract more populations and to promote more development of economic sectors, resulting in creation of higher per-capita GDP.

##### **(2) Economic Roles of Transport Function (Connectivity) of the Overall TaToM Area**

The Project TaToM is to provide a vital connectivity between Antananarivo (national capital and economic centre of Madagascar) and Toamasina (city with the largest sea port), by the transportation system of the TaToM Economic Axis.

On the other hand, Toamasina Agglomeration is a hub to connect Toamasina Port with the northern area and the southern area of the east coast by National Road No.5 (NR5) and the Pangalanes Canal. Moreover, Toamasina Agglomeration is connected to other coastal areas by sea transport, such as caboteus and boutres. Those coastal areas connected to Toamasina expect Toamasina's urban markets to grow so that those coastal areas could utilize their economic developmental potential, as well as the strengthening of sea transport along the coast.

Antananarivo Agglomeration is also a hub to connect the national economic centre of Antananarivo with the northern area by National Road No.3 (NR3), the north-western area by National Road No.4 (NR4), with the western area by National Road No.1 (NR1) and with the southern area by National Road No.7 (NR7) and railway. Therefore, if the urban transportation of Antananarivo Agglomeration is not well developed continuing to cause severe traffic congestion, the expected hub function of Antananarivo Agglomeration will not be satisfied and surrounding areas will not well connected to the national economic centre in Antananarivo and national sea port of Toamasina.

#### **3.4.2 Future Vision for the Overall TaToM Area**

Since 1991, Madagascar has experienced three political crises, and economic sectors have been damaged during the uncertain twenty years. Considering the economic and transport roles and developmental potentialities discussed above, the Overall TaToM Area is expected to contribute to “reconstruction of Madagascar’s economy” and “recovery of the stability of Madagascar’s society.”

This expectation can be interpreted as the future vision for the Overall TaToM Area. The statement of the future vision is as follows:

### **[Future Vision for the Overall TaToM Area]**

*“Through the development of the Overall TaToM Area, Madagascar’s economy will be reconstructed and stability of Madagascar’s society will be regained. The Overall TaToM Area will sustainably develop its own economic sectors. Furthermore, it could support the development of economies of other regions by enhancing the connectivity to other regions from Antananarivo and the connectivity to other regions from Toamasina Port through the upgrading of the transport function of the TaToM Economic Axis.*

## **3.5 Growth Scenarios for the Overall TaToM Area**

### **3.5.1 Factors for Creating Alternative Growth Scenarios for the Overall TaToM Area**

For formulating alternative growth scenarios for the Overall TaToM Area, the following three kinds of factors/ issues are considered.

#### **(1) Potential Economic Sectors for Madagascar and Overall TaToM Area**

Based on the analysis on Madagascar’s future vision and SWOT Analysis of Antananarivo and Toamasina Agglomerations, it is considered that there is no choice to continue to depend only on the production of primary commodities (agricultural and mineral products) and textile industries in order to recover the economic growth and social stability in Madagascar. It is necessary for Madagascar to make substantial effort at promoting new types of industries targeting new markets, besides continuing the expansion of the existing economic sectors.

As shown in the analysis of potential industries of Madagascar in Chapter 2, Madagascar has possibility to export agro-processing, textile and light industrial products targeting regional markets of South African countries and Indian Ocean countries by taking advantage of proximity to their markets and reduced custom duties due to free trade areas where Madagascar belongs.

The possible new markets which Madagascar should target are the consumers markets in the expanding free trade areas through the regional economic communities. While SADC and COMESA have currently 200 million urban populations, they will increase their urban population as much as 400 million, half of which might be middle-income populations.

Possible new types of industries include 1) light industries that manufacture daily use products including household sundries, kitchen and dining products, baby goods and beauty care products and 2) agro-processing industries that utilise local agricultural products targeting middle-income populations because the region’s demand for such daily consumer goods and agro-processed products is increasing and countries that currently produce these products are suffering from the increase of their wages of workforce wages.

Such light industries, agro-processing industries and textile industries are urban-based possible economic sectors which could recover and further develop the economies of Madagascar after the last over 25 years of political crises. However, due to the prolonged political instabilities, private investment dropped largely (see Table 2.2.6), and infrastructure rehabilitation and development decreased heavily because of suspension and interruption of international and bi-lateral developmental assistance. Therefore, it is important to strategically allocate Madagascar’s national resources not only to rehabilitate and construct new infrastructures for responding to increasing population and economic activities, but also to the transformation of structure of national economic sectors and spatial structure of the national territory. The Project TaToM could be one of the nationally important initiatives for such transformation of Madagascar’s economic and territory.

#### **(2) Past Difficulties of Toamasina for Economic Sectors Development**

Although Toamasina Agglomeration is the second largest populous city with the most important export-import port function in Madagascar, it has failed to take advantage of the proximity not

only to Toamasina Port, but also to overseas markets and to attract investment to its economic sectors. It was partly because Toamasina has limited allocation of national budgets for developing enough economic and social infrastructures to support industries due to its low priority in national development. However, more importantly it is because Toamasina is very far (350 km) from the national capital, Antananarivo, in terms of travel time (over 8 hours by passenger cars and taxi brousse). Toamasina is connected to Antananarivo by National Road No. 2 (NR2) and railway. Since NR2 runs through mountainous areas, the vertical and horizontal alignments are very bad, and the cost for improving the road alignments is too large to implement. As a result, annual regular maintenance has been done for keeping the minimum connectivity between Antananarivo and Toamasina for importing fuel and other essential products and exporting products of inland regions including Antananarivo Agglomeration and Antsirabe through Toamasina Port. Because of this situation, in the last many years, it has been difficult for Madagascar to upgrade NR2 for improving the transport capacity of cargo and for reducing travel time of passengers. The attractiveness of investment to economic sectors in Toamasina requires the reduction of travel time for passengers on NR2 because investors, managers, accountants and engineers have to visit Toamasina for monitoring and management of productive operation.

For promoting the development of economic sectors in Toamasina Agglomeration, it is indispensable to upgrade the transport capacity and speed of NR2 and to rehabilitate the railway between Antananarivo and Toamasina, not only by taking measures for improving traffic safety and road resilience, but also provision of bypass roads and climbing lanes in steep slope sections of NR2. The Project TaToM would pay attention to the reasons for underdevelopment of economic sectors of Toamasina Agglomeration and to the importance of upgrading the transport function of TaToM Economic Axis connecting Antananarivo and Toamasina.

### **(3) Continuing Increase of Concentration of Population and Economic Activities in Antananarivo Agglomeration**

In the last 25 years and more, Madagascar has struggled to sustain the provision of infrastructures in its country because of its political unitability and economic difficulties. Regional cities and rural areas have suffered the shortage of budgets for maintenance and rehabilitation of infrastructures. As a result, populations have continuously moved from regional cities and rural areas into Antananarivo Agglomeration, which have relatively good infrastructure and job opportunities in comparison with other regions. In 2018, Antananarivo Agglomeration has approximately 3 million populations. In such a large metropolitan area, relatively well educated and trained human resources are available in comparison with other regions.

Because of this situation of infrastructure and human resources, Antananarivo Agglomeration is considered to continue to accumulate populations and economic activities so as to become a huge metropolitan area of 5 million by 2033 and 10 million by 2050. However, it is important to develop the second and third largest cities by promoting investment to economic sectors and by infrastructure development, for the purpose of effectively utilizing various parts of the national territory and reducing the mono-centric concentration of population and economic activities to Antananarivo Agglomeration. It is because such a large city of 5 million to 10 million populations is not so efficient that traffic congestion and shortage of infrastructure services become prominent that the quality of social life would be deteriorated and the productivity of economic activities would be lowered.

At the same time, it is necessary to continue to create jobs for the increasing urban populations in Antananarivo Agglomeration by attracting investment to economic sectors and by providing economic infrastructures to support development of economic sectors.

The Project TaToM should address to these issues by formulating a good growth scenario for the Overall TaToM Area.



### 3.5.2 Alternative Growth Scenarios for the Overall TaToM Area

Three alternative growth scenarios are formulated for the Overall TaToM Area considering the following:

- Possible locations of light industries and agro-processing industries, as well as of textile industries in the Overall TaToM Area
- How to improve the connectivity between Antananarivo and Toamasina to support the economic growth of Overall TaToM Area

#### (1) Alternative Growth Scenario A for the Overall TaToM Area: “Mega City Antananarivo and Toamasina Logistics City”

The functions of business headquarters and economic production, as well as those of national political/government centre and commercial centre, will be enhanced largely by concentrating a larger amount of public investment for upgrading the level of infrastructure development and by attracting private investment to economic sectors in Antananarivo Agglomeration. By implementing this growth scenario, a highly efficient economic growth will be sought for Antananarivo Agglomeration.

In addition to existing economic sectors, such as textile industries and ICT sector, much effort at development of economic sectors is made for Antananarivo Agglomeration by emphasizing the attraction of investments to agro-processing industries and light industries targeting middle-income populations in free trade areas of African and Indian Ocean countries. Under this growth scenario, Antananarivo Agglomeration would become the mono centre of Madagascar, which accumulates a large proportion of important economic production functions and urban populations into one location. In this sense, we call Antananarivo Agglomeration “Mega City Antananarivo.”

However, it would become necessary to transform the spatial structure of Antananarivo Agglomeration by strategically developing infrastructures and distributing residential populations and urban centres outside CUA, in order to solve the mal-functioning due to over-concentration of urban population and economic activities in comparison with existing infrastructure.

In order to support such a high economic growth of Antananarivo Agglomeration and other regions, the logistics function of Toamasina Agglomeration and the economic axis between Antananarivo and Toamasina will be strengthened. In this growth scenario, Toamasina Agglomeration is expected to improve its logistics sector efficiency to support the economic development of Antananarivo Agglomeration. Although Toamasina Agglomeration will also promote the development of tourism sector, in this growth scenario, Toamasina Agglomeration will remain as a “Logistic City.”

This growth scenario emphasizes the importance of the widening of existing 2-lane road of NR2 to 4 lanes in selected sections, in addition to traffic safety and resilience strengthening measures, as well as to solving bottlenecks by replacing 2-lane bridges and implementing bypass roads.

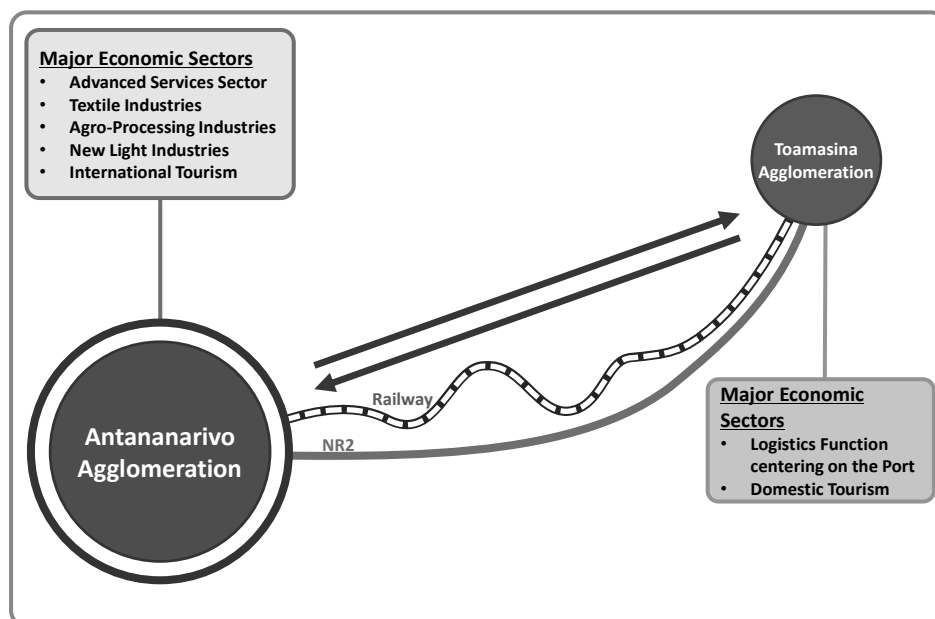


Figure 3.5.1 Growth Scenario A for Overall TaToM Area: “Mega City Antananarivo and Toamasina Logistics City”

**(2) Alternative Growth Scenario B for the Overall TaToM Area: “Antananarivo Service Capital and Toamasina Industrial City”**

Toamasina Agglomeration will develop not only its logistics function based on the expanded port of Toamasina, but also manufacturing industries and tourism sector by attracting investment to those economic sectors. Toamasina Agglomeration will be developed as the most important “industrial city” in Madagascar, by taking advantage of its proximity to Toamasina Port, as well as to regional markets (free trade areas) in African and Indian Ocean countries.

Since at present Toamasina Agglomeration is short of economic infrastructures to support such economic sectors development, it will be necessary to provide economic infrastructure for supporting operation of economic sectors. However, the economic sectors of Toamasina Agglomeration will be able to utilize economic infrastructures (such as access roads, power and water supply) to be planned and developed for Toamasina Port.

In Toamasina Agglomeration, this growth scenario will expand residential areas and distribute urban centres all over Toamasina Agglomeration, as well as strengthen the logistics function including access roads to Toamasina Port, so that it could mitigate the mal-functioning of urban functions in Toamasina Agglomeration due to over-concentration of urban populations within CUT.

On the other hand, Antananarivo Agglomeration will be developed as the centre for business headquarters and business supporting services in addition to national governmental centre and commercial/service centre. However, the development of manufacturing industries would be limited to expansion of existing textile industries by relocating to suburban areas. Instead, other agglomerations, such as Toamasina, Antsirabe and Moramanga, would become the location of manufacturing industries, such as textile, agro-processing and other light industries.

Much effort at development of economic sectors is made for Toamasina Agglomeration by emphasizing the attraction of investments to textile industries, agro-processing industries and light industries. Toamasina Agglomeration will go beyond the port and logistics centre and become a port-based industrial city. On the other hand, Antananarivo Agglomeration will play an important role as the national centre of services and textile industries. The services to be provided by Antananarivo Agglomeration include not only services and commerce to residential communities, but also functions of cooperate headquarters, banking and business support services. In this sense, for Growth Scenario B, we call Antananarivo Agglomeration “Antananarivo Service Capital.”

Since Toamasina Agglomeration is still small in terms of the size of urban areas and urban populations, and does not have sufficient well-educated nor trained human resources, it would take more time to develop economic sectors in Toamasina Agglomeration than in Antananarivo Agglomeration.

To follow this growth scenario, it is essential to construct climbing lanes on steep slope sections of NR2 and a bypass road for Moramanga, as well as to improve the performance of air transport, in order to achieve a higher speed for passenger transport. It is because managers, accountants and engineers need to travel to Toamasina from Antananarivo or to Antananarivo from Toamasina for managing the operation of factories in Toamasina Agglomeration. However, about 10 years would be necessary to satisfy this very basic condition for enabling the acceleration of development of economic sectors in Toamasina Agglomeration,

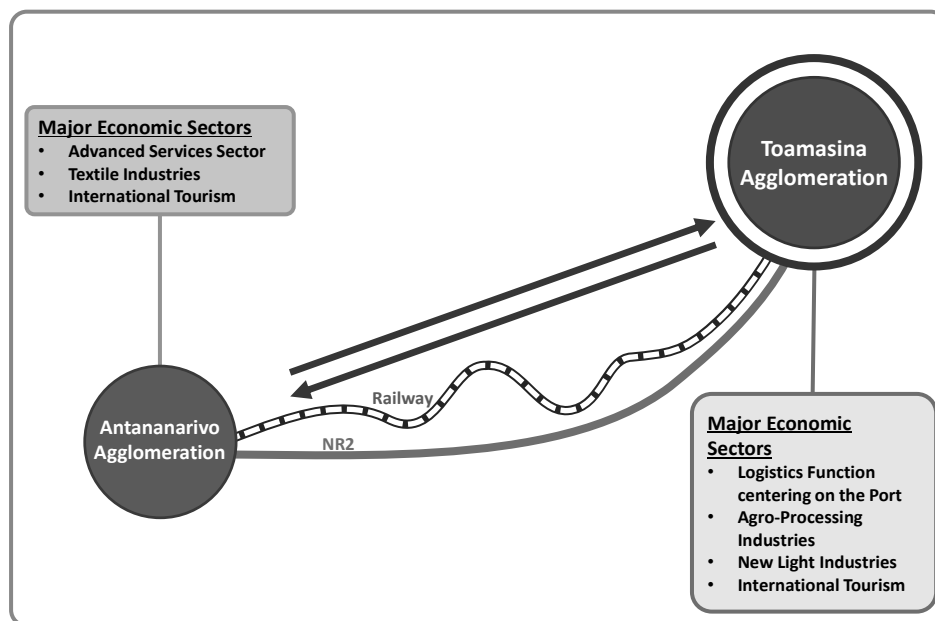


Figure 3.5.2 Growth Scenario B for the Overall TaToM Area: “Antananarivo Service Capital and Toamasina Industrial City”

### (3) Alternative Growth Scenario C for the Overall TaToM Area: “Antananarivo Service-Industrial Metropolis and Toamasina Industrial City”

Growth Scenario C aims at establishment of Antananarivo Service-Industrial Metropolis in connection with a strong economic axis with Toamasina Industrial City, based on the rapid growth of economic sectors as a whole of the Overall TaToM Area. For following this growth scenario, much effort at development of economic sectors will be made both for Antananarivo Agglomeration and Toamasina Agglomeration, by emphasizing the attraction of investments to textile industries, agro-processing industries and other light industries.

The target manufacturing industries of Antananarivo Agglomeration and Toamasina Agglomeration would be the same. However, the timing of development of their competitiveness to attract investment to such industries would be different.

In actuality, Antananarivo Agglomeration will be able to attract additional manufacturing industries earlier than Toamasina Agglomeration because Antananarivo Agglomeration has relatively good infrastructure and well-educated/trained human resources than Toamasina Agglomeration in the first 10 years.

Furthermore, it will be necessary for Antananarivo Agglomeration to continue to develop its functions to provide high-level business services and to locate business headquarters within CUA and surrounding urban sub-centres, as well as to accommodate manufacturing industries outside

CUA for the purpose of creating jobs for increasing urban populations in Antananarivo Agglomeration. In this sense, we call it Antananarivo Service-Industrial Metropolis.

Toamasina Agglomeration will develop logistics industry and tourism sector in the short term based on its existing infrastructure. Eventually in the middle and long terms, it will develop manufacturing industries including textile, agro-processing and other light industries targeting regional consumer markets in African and Indian Ocean countries. Toamasina Agglomeration has its locational advantage in proximity not only to Toamasina Port but also to regional markets (freed trade areas) of Africa and Indian Ocean countries.

At present, Toamasina Agglomeration is insufficient of economic infrastructures to attract and support manufacturing industries, while it might be possible to attract tourism sectors based on existing infrastructure in the short term. Moreover, it would require at least 10 years for the upgrading of NR2 by implementing measures for traffic safety and resilience and construction of bypass roads and climbing lanes in selected sections. In Toamasina Agglomeration, economic infrastructure development will be strategically promoted by depending on infrastructure (access roads, water and power supply) to be provided for Toamasina Port.

In this way for promoting the development of economic sectors both in Toamasina and Antananarivo Agglomerations, it is essential to upgrade the transport system of TaToM Economic Axis (between Antananarivo and Toamasina) not only by taking traffic safety measures and resilience strengthening measures, but also by construction of bypass roads and a climbing lane of NR2. This set of measures could achieve the increase of travel speed of passengers and the increase of cargo transport capacity.

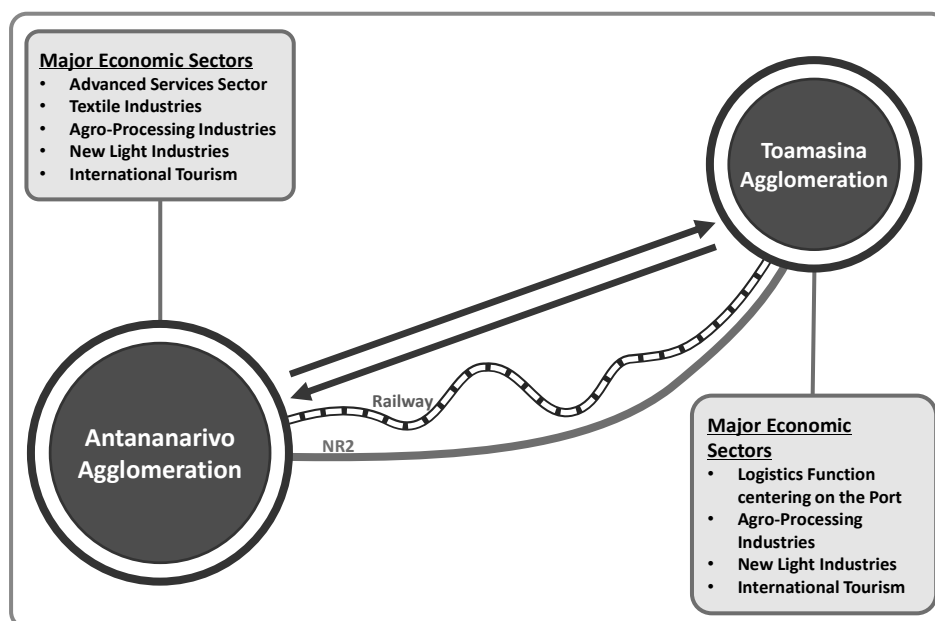


Figure 3.5.3 Growth Scenario C for the Overall TaToM Area: “Antananarivo Service-Industrial Metropolis and Toamasina Industrial City”

Major characteristics of alternative growth scenarios are summarized and compared as shown in Table 3.5.1.

**Table 3.5.1 Summary of Major Characteristics of the Three Alternative Growth Scenarios for Overall TaToM Area**

	Name of Growth Scenario	Antananarivo Agglomeration	Transport System of TaToM Economic Axis	Toamasina Agglomeration
<b>Growth Scenario A</b>	<b>Mega City Antananarivo and Toamasina Logistics City</b>	<ul style="list-style-type: none"> <li>Upgrading of Advanced Service Sectors</li> <li>Expansion of Residential Areas outside CUA</li> <li>Development of Economic Sectors including Textile, Agro-Processing and Other Light Industries</li> </ul>	<ul style="list-style-type: none"> <li>Upgrading of Cargo Transport Volume between Antananarivo Agglomeration and Toamasina Port in Longer Sections of NR2</li> </ul>	<ul style="list-style-type: none"> <li>Strengthening of Logistics Function centring on Toamasina Port</li> <li>Development of domestic tourism</li> </ul>
<b>Growth Scenario B</b>	<b>Antananarivo Service Capital and Toamasina Industrial City</b>	<ul style="list-style-type: none"> <li>Upgrading of Advanced Service Sectors</li> <li>Expansion of Residential Areas outside CUA</li> </ul>	<ul style="list-style-type: none"> <li>Upgrading of Passenger Transport Speed by Constructing a Climbing Lane in Selected Sections of NR2</li> <li>Upgrading of Cargo Transport Volume by Widening in Selected Sections of NR2</li> </ul>	<ul style="list-style-type: none"> <li>Development of Economic Sectors including Agro-Processing, Textile and Other Light Industries, as well as Tourism</li> <li>Expansion of Residential Areas outside CUT</li> </ul>
<b>Growth Scenario C</b>	<b>Antananarivo Service-Industrial Metropolis and Toamasina Industrial City</b>	<ul style="list-style-type: none"> <li>Upgrading of Advanced Service Sectors</li> <li>Expansion of Residential Areas outside CUA</li> <li>Development of Economic Sectors including Textile, Agro-Processing and Other Light Industries</li> <li>Antananarivo Agglomeration's speed of economic sectors development in the first 10 years is much higher than after the first 10 years, due to its relatively well-developed existing infrastructure and relatively well-trained human resources</li> </ul>	<ul style="list-style-type: none"> <li>Upgrading of Passenger Transport Speed by Constructing a Climbing Lane in Selected Sections of NR2</li> <li>Upgrading of Cargo Transport Volume by Widening in Selected Sections of NR2</li> </ul>	<ul style="list-style-type: none"> <li>Development of Economic Sectors including Agro-Processing, Textile and Other Light Industries, as well as Tourism</li> <li>Expansion of Residential Areas outside CUT</li> <li>After the first 10 years, Toamasina Agglomeration's development of economic sectors will be accelerated because the upgrading of the transport system of Economic Axis and expansion of Toamasina Port are to be completed.</li> </ul>

### 3.5.3 Selected Growth Scenario for the Overall TaToM Area

The three growth scenarios were evaluated by using the following three criteria:

- Employment Generation by Implementation of TaToM
- Sustainability of Implementation of TaToM Development Strategies
- Cost for Implementation of TaToM Development Strategies

The result of evaluation is shown in Table 3.5.2.

Growth Scenario C is selected for the development of the Overall TaToM Area. In accordance with Growth Scenario C for the Overall TaToM Area, PUDi for Antananarivo Agglomeration, PUDi for Toamasina Agglomeration, and transport and territorial development plan for TaToM Economic Axis are formulated.

**Table 3.5.2 Comparative Evaluation of the Three Alternative Growth Scenarios of Overall TaToM Area**

	Growth Scenario A	Growth Scenario B	Growth Scenario C
<b>Name of Growth Scenario</b>	<b><u>Mega City Antananarivo and Toamasina Logistics City</u></b>	<b><u>Antananarivo Service Capital and Toamasina Industrial City</u></b>	<b><u>Antananarivo Service-Industrial Metropolis and Toamasina Industrial City</u></b>
<b>Employment Generation by Implementation of TaToM</b>	<b><u>Medium</u></b> Growth Scenario A depends mostly on Antananarivo Agglomeration in development of economic sectors and generation of employment opportunities. Since Antananarivo Agglomeration has relatively good infrastructure compared to other regional cities and rural areas, it is efficient to	<b><u>Small-Medium</u></b> Since Toamasina Agglomeration is much smaller than Antananarivo Agglomeration, it is difficult to generate a larger amount of employment opportunities than	<b><u>Large</u></b> In this growth scenario, both Antananarivo Agglomeration and Toamasina Agglomeration will be able to develop economic sectors based on their own characteristics. The two agglomerations are expected to general

	concentrate government and private investment to infrastructure provision and economic sectors development. However, this growth would have limitation in the medium-long terms. It is partly because too much concentration of population and economic activities would cause mal-functioning due to heavy traffic congestion. Moreover, Antananarivo Agglomeration will have to continue to depend on National Road No.2 (NR2) for its export and import.	Scenario A and Scenario C in the next 15 years. In the longer term, this scenario would become possible to generate a substantially large amount of employment opportunities.	a larger amount of employment opportunities than Scenario A and Scenario B.
<b>Sustainability of Implementation of TaToM Development Strategies</b>	<b>Small</b> Partly because Antananarivo Agglomeration will accumulate too much population and economic activities in the medium-long terms. As a result, Antananarivo Agglomeration would become too congested and mal-functional, causing serious environmental deterioration. Partly because the limited transport capacity of NR2 will eventually cause the increase of inefficiency of development and operation of economic sectors in Antananarivo Agglomeration.	<b>Small-Medium</b> Antananarivo Agglomeration will continue to attract populations from regional cities and rural areas. However, Antananarivo Agglomeration will not be able to generate enough amount of employment opportunities for the incoming populations. As a result, Antananarivo Agglomeration will not be sustainable in urban and economic development.	<b>Medium-High</b> In the short and medium terms (5-10 years), this scenario depends on the development of economic sectors of Antananarivo Agglomeration. Therefore, a large influx of population and economic activities to Antananarivo Agglomeration might cause overcrowding and traffic congestion, and furthermore, environmental deterioration. This might lead to malfunctioning of Antananarivo Agglomeration. However, the development of economic sectors in Toamasina Agglomeration will be accelerated in the medium and long terms. Moreover, in the medium term, the spatial restructuring of Antananarivo Agglomeration will become effective in reducing concentration in CUA. Therefore, eventually in the medium-long terms, the sustainability of the Overall TaToM Area could be managed.
<b>Cost for Implementation of TaToM Development Strategies</b>	<b>Large</b> Since this growth scenario needs the upgrading of cargo transport capacity of NR2 for promoting economic sectors development in Antananarivo Agglomeration, a larger amount of cost is required, especially for Antananarivo Agglomeration and TaToM Economic Axis. The majority of the cost for TaToM Economic Axis will be spent for widening of narrow 2-lane road to 4 lanes on NR2. As a result, the total cost for Growth Scenario A is larger than that of Growth Scenario B and equally large as Growth Scenario C.	<b>Medium</b> Since this scenario needs the upgrading of the transport system of TaToM Economic Axis by constructing a climbing lane of NR2, it is costly. However, its cost is smaller than that for Scenario A and C.	<b>Large</b> This growth scenario needs spatial structural transformation of both agglomerations of Antananarivo and Toamasina, as well as the upgrading of cargo transport volume and passenger transport speed of NR2, the total cost for implementing TaToM development strategies is the highest among these three scenarios.
<b>Integrated Evaluation of Effectiveness</b>	<b>Small-Medium Effective</b> This scenario requires a large cost for implementation of TaToM development strategies. However, the effectiveness of employment generation is medium and sustainability is small. Therefore, it is considered the effectiveness of this scenario is medium.	<b>Small-Medium Effective</b> Since the employment generation is small-medium, while the cost for implementation of this scenario is medium, the effectiveness of implementing of this scenario would be small-medium.	<b>Medium Effective</b> Although the cost for implementing this scenario is large, the degree of economic sectors development and employment generation is large enough to make the effectiveness of this scenario large. In addition, the sustainability is medium-high. Therefore, it is considered recommendable for development of the Overall TaToM Area.

### 3.6 Future Socio-Economic Frameworks for the Overall TaToM Area

#### 3.6.1 Future Population Framework for the Overall TaToM Area

##### (1) Future Populations of Madagascar

The national population of Madagascar is estimated to be increasing rapidly at an annual growth rate of over 3%, according to an UN projection. The future population projected by UN has three cases namely, high, medium and low. The medium case estimates that the population of Madagascar will be larger than 55 million in 2050, while the low case estimates the population to

be approximately 50 million, and the high case approximately 60 million. Major differences in the three projects are total fertility rates.

**Table 3.6.1 Future Population Projections of Madagascar by UN**

		1993*	2015	2033	2038	2043	2050
Low Case	Population	12,238,914	24,235,390	36,790,234	40,557,847	44,345,698	49,527,126
	Annual Growth Rate		3.15%	2.35%	1.97%	1.80%	1.59%
Medium Case	Population	12,238,914	24,235,390	38,625,000	43,257,916	48,128,293	55,293,757
	Annual Growth Rate		3.15%	2.62%	2.29%	2.16%	2.00%
High Case	Population	12,238,914	24,235,390	40,462,606	45,980,803	52,000,356	61,370,519
	Annual Growth Rate		3.15%	2.89%	2.59%	2.49%	2.40%

Source: UN, 2015, World Population Prospects: The 2015 Revision

Source\*: INSTAT, 1996, Recensement Général de la Population et de l'Habitat

## (2) Future Population Framework for Madagascar

The medium case of UN's population projection is selected as the preliminary population framework of Madagascar for TaToM, with the annual population growth rate of 2.60% between 2018 and 2033. The population annual growth rates are considered to decrease gradually, and the national population is projected to reach 37.8 million in 2033.

**Table 3.6.2 Future Population Framework of Madagascar**

	1993*	2018**	2023	2028	2033	Annual Growth Rate 2018-2033
Total Population	12,238,914	25,734,342	29,545,202	33,547,418	37,829,461	2.60%
Annual Growth Rate		3.02%	2.80%	2.57%	2.43%	

Source: JICA Study Team based on population annual growth rate in UN, 2015, World Population Prospects: The 2015 Revision

Source\*: INSTAT, 1996, Recensement Général de la Population et de l'Habitat

Source\*\*: INSTAT, 2019, Troisième Recensement Général de la Population et de l'Habitat Résultats Provisoires

In 1993, the share of urban population in the total population of Madagascar was approximately 30%. According to the data from INSTAT, the urban population of Madagascar in 2018 is to increase to 6,102 thousand. However, the share of urban population has decreased to 23.7%. This is because the urban population of INSTAT only includes the population of urban communes, while in cities like Antananarivo, Toamasina and Moramanga, urban population has expanded beyond the commune boundary into the neighbouring rural communes. In 2033, the share of urban population including that living in current rural communes is estimated to increase to 38.5%.

**Table 3.6.3 Future Urban and Rural Populations of Madagascar**

	1993 <sup>1</sup>	2018 <sup>1</sup>	2033 <sup>2</sup>
Urban Population	2,800,229	6,101,756	14,564,000
Annual Growth Rate		3.16%	5.97%
Rural Population	9,438,771	19,632,586	23,265,000
Annual Growth Rate		2.97%	1.14%
Share of Urban Population	29.67%	23.71%	38.50%
Share of Rural Population	70.33%	76.29%	61.50%

Source 1: INSTAT

Source 2: JICA Study Team

## (3) Future Population Framework for Overall TaToM Area

Future population by region is projected based on the past trend of demographic changes in the country and the future attractiveness of the Overall TaToM Area due to developments proposed under this master plan. The results are shown in Table 3.6.4. The share of population will increase the most in Analamanga Region.

**Table 3.6.4 Future Population by Region (2023, 2028 and 2033)**

Province	Region	Population				Annual Growth Rate		
		2018	2023	2028	2033	2018-23	2023-28	2028-33
Antananarivo	<b>Analamanga</b>	<b>3,618,128</b>	<b>4,178,447</b>	<b>4,787,688</b>	<b>5,465,075</b>	<b>2.92%</b>	<b>2.76%</b>	<b>2.68%</b>
	Bongolava	674,474	819,581	982,078	1,165,351	3.97%	3.68%	3.48%
	Itasy	897,962	1,010,194	1,121,093	1,232,526	2.38%	2.11%	1.91%
	Vakinankaratra	2,074,358	2,268,479	2,450,172	2,624,604	1.81%	1.55%	1.38%
Fianarantsoa	Atsimo-Atsinanana	1,026,674	1,206,408	1,398,285	1,605,336	3.28%	3.00%	2.80%
	Amoron'i Mania	833,919	922,901	1,008,745	1,093,580	2.05%	1.79%	1.63%
	Ihorombe	418,520	522,480	643,831	786,386	4.54%	4.27%	4.08%
	Haute Matsiatra	1,447,296	1,619,693	1,789,302	1,959,594	2.28%	2.01%	1.83%
	Vatovavy-Fitovinany	1,435,882	1,614,038	1,790,667	1,969,025	2.37%	2.10%	1.92%
Toamasina	<b>Atsinanana</b>	<b>1,484,403</b>	<b>1,676,328</b>	<b>1,875,844</b>	<b>2,089,831</b>	<b>2.46%</b>	<b>2.27%</b>	<b>2.18%</b>
	<b>Alaotra-Mangoro</b>	<b>1,255,514</b>	<b>1,431,863</b>	<b>1,623,096</b>	<b>1,833,562</b>	<b>2.66%</b>	<b>2.54%</b>	<b>2.47%</b>
	Analanjirifo	1,152,345	1,298,873	1,446,710	1,599,164	2.42%	2.18%	2.02%
Mahajanga	Betsiboka	394,561	461,056	531,872	608,263	3.16%	2.90%	2.72%
	Boeny	931,171	1,093,832	1,268,566	1,458,653	3.27%	3.01%	2.83%
	Melaky	309,805	365,646	425,874	491,553	3.37%	3.10%	2.91%
	Sofia	1,500,227	1,736,041	1,982,962	2,245,193	2.96%	2.70%	2.52%
Toliary	Androy	903,376	1,077,421	1,267,618	1,477,435	3.59%	3.30%	3.11%
	Atsimo-Andrefana	1,799,088	2,115,812	2,454,750	2,821,435	3.30%	3.02%	2.82%
	Anosy	809,313	918,576	1,028,151	1,139,648	2.57%	2.28%	2.08%
	Menabe	700,577	826,647	962,422	1,110,272	3.36%	3.09%	2.90%
Antsiranana	Diana	889,736	1,052,534	1,229,047	1,422,699	3.42%	3.15%	2.97%
	Sava	1,177,013	1,328,352	1,478,645	1,630,276	2.45%	2.17%	1.97%
Madagascar		25,734,342	29,545,202	33,547,418	37,829,461	2.80%	2.57%	2.43%
<b>Total Population of 3 Regions Covering Overall TaToM Area</b>		<b>6,358,045</b>	<b>7,286,638</b>	<b>8,286,628</b>	<b>9,388,468</b>	<b>2.76%</b>	<b>2.61%</b>	<b>2.53%</b>

Source: JICA Study Team

The total population of the three regions which covers Overall TaToM Area will increase from 6.4 million in 2018 to 9.4 million in 2033. This is 24.8% of the national population in 2033.

### 3.6.2 Future Economic Framework for the Overall TaToM Area

#### (1) GDP in the Existing National-Level Development Plans and Projections

In order to set the gross regional domestic products (GRDP) growth targets in TaToM Economic Axis in 2023, 2028, and 2033, the following existing development plans or projections were reviewed:

- National Development Plan (PND) 2015-2019
- Programme Sectoriel Agricole, Elevage et Pêche ou PSAEP (2015)
- Document de Politique Industrielle de Madagascar (2014)

##### 1) National Development Plan (PND) 2015-2019

According to PND, the growth scenario is shown in Table 3.6.5. The sectors that drive the growth in Madagascar include agriculture, fisheries, mining, export processing enterprises, construction, tourism and transport (and related infrastructure).

**Table 3.6.5 National GDP Growth Scenario by PND 2015-2019**

	2015	2016	2017	2018	2019
Growth Rate	5.0%	7.0%	8.9%	10.4%	10.5%

Source: National Development Plan (PND) 2015-2019



## **2) Programme Sectoriel Agricole, Elevage et Pêche (2015)**

Agriculture, Livestock and Fishery Sectorial Programme (PSAEP: *Programme Sectoriel Agricole, Elevage et Pêche*) prepared in 2015 guides the direction of growth for the primary sector in Madagascar for the year 2025. The objectives determined for the target year are (i) to achieve competitive and sustainable agricultural production, leading to food security and an increase in exports, (ii) to integrate family farms and modernize processing units, and (iii) to achieve agricultural growth of 6 percent per year. There are five programmes for these objectives: rational and sustainable exploitation of the resources and production (two million ha of investment zones will be created by 2025); continuous improvement of productivity; contribution to food security; improvement of access to markets; and improvement of institutional governance.

## **3) Document de Politique Industrielle de Madagascar (2014)**

The industrial policy targets that the share of industrial sector to GDP will be 25% by 2025 and labour intensive industry will be shifted to high technological industry. Additionally, the Government is in the process of updating its legislation pertaining to the mining and upstream petroleum industries to attract foreign investment. Moreover, the Government is developing new legislation on Special Economic Zones.

## **4) Other Projections**

According to the World Economic Outlook Database (October, 2017) by the International Monetary Fund (IMF), projected GDP growth rate is 4.3 percent in 2017, 5.3 percent in 2018, and an average growth rate is 5.4 percent from 2019 to 2022. Furthermore, the World Bank estimated 4.5 percent in 2017, and 4.8 percent in 2018 and 2019.

## **(2) Future Economic Framework for Madagascar**

The indicators of the economic growth are shown in Table 3.6.6. The indicators are set using the following:

- Growth rates before 2019 are mainly based on the growth rates of GDP determined by Project TaToM based on National Development Plan (PND) and statistics of INSTAT (Tableau de Bord Économique, Avril 2017).
- The growth rate estimation beyond 2020 is determined based on the following:
  - Primary Sector: Annual growth rate of 6% is set based on PSAEP 2015.
  - Secondary Sector: Annual growth rate is set to raise the share of secondary sector to GDP as much as possible towards the figure determined in Industrial Policy Document for Madagascar (Document de Politique Industrielle de Madagascar) 2014, which targets the share of industrial sector to GDP will be 25% by 2025. According to “Vision 2030 of Madagascar” (Fisandratana 2030: Growth and Transformation Plan – Development Vision of Madagascar Toward the 2030 Horizon), extractive industries (industrial mines and hydrocarbons), textile industry, agro-industry, fishery processing industry and precious stone industry are strong potentials for growth in the domestic and global markets. However, the share of secondary sector to GDP by TaToM's estimation does not reach 25% by 2025, considering the past trend and present situation.
  - Tertiary Sector: Annual growth rate is set at a figure between 6% and 8% according to the past trend.

**Table 3.6.6 Growth Rates of GDP by Economic Sector for Madagascar**

	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)	Total (%)
2016-2023	4.5	7.4	5.7	5.6
2024-2028	6.0	12.1	7.0	7.7
2029-2033	6.0	10.0	7.9	7.9

Source: JICA Study Team based on PND and data from INSTAT

Table 3.6.7 illustrates the change of share of economic sector and growth rates by economic sector based on the indicators set above.

**Table 3.6.7 Future Economic Framework for Madagascar**

**(a) Change of Share of Economic Sector**

	GDP (MGA Billion, at 2007 constant prices)	GDP (USD Million, at 2010 constant prices)	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)
2014 (Actual)	17,368	10,688	28.3	13.8	57.9
2023 (Projected)	27,642	17,011	25.0	16.4	58.6
2028 (Projected)	39,966	24,595	23.1	20.0	56.8
2033 (Projected)	58,455	35,973	21.2	22.1	56.8

**(b) Change of GDP per Capita**

	Unit	2014	2023	2028	2033
Total Population		22,848,573	29,545,202	33,547,418	37,829,461
GDP	MGA Billion, at 2007 constant prices	17,368	27,642	39,966	58,455
	USD Million, at 2010 constant prices	10,688	17,011	24,595	35,973
GDP per Capita	MGA, at 2007 constant prices	760,135	935,583	1,191,329	1,545,224
	USD, at 2010 constant prices	468	576	733	951
Annual Growth Rate of GDP per Capita at 2007 constant prices		-	2.33%	4.95%	5.34%

Source: JICA Study Team

### (3) Methodology of GRDP Projections for the Overall TaToM Area

Estimation of GRDP by sector is calculated based on the share of GRDP to National GDP in 2014 (Table 3.6.8). The economic framework is projected using the data at the regional level, since there are no district level data.

Economic indicators for development, such as projected growth rate of GRDP and GRDP by economic sectors, do not exist for TaToM Economic Axis. Therefore, it is assumed that GRDP of Overall TaToM Area is the total amount of GRDP of the three regions (Analamanga, Atsinanana and Alaotra-Mangoro) in Project TaToM. The share of GRDP to national GDP and the share of each economic sector in three regions, which are based on the data of National Statistics Institute (INSTAT) estimated in June 2018, are used for the starting point of the projections.

**Table 3.6.8 Share of GRDP to National GDP (2014)**

(GDP at Factor Cost, MGA Billion at current prices)

Region	Primary Sector		Secondary Sector		Tertiary Sector		Total	Share
Analamanga	484	6.0%	2,274	57.8%	9,116	55.2%	11,874	41.7%
Atsinanana	381	4.7%	559	14.2%	1,044	6.3%	1,984	7.0%
Alaotra-Mangoro	281	3.5%	226	5.7%	456	2.8%	963	3.4%
Others	6,911	85.8%	876	22.3%	5,896	35.7%	13,683	47.9%
Total	8,057	100.0%	3,935	100.0%	16,512	100.0%	28,504	100.0%

Note: National GDP in 2014 at 2007 constant prices amounts to MGA 17,368 billion.

Source: JICA Study Team based on National Statistics Institute (INSTAT) (June, 2018)

### (4) Future Economic Framework for the Overall TaToM Area

The indicators of the economic growth for the Overall TaToM Area are shown in Table 3.6.9. Based on the growth scenario for the Overall TaToM Area, the economic growth of Madagascar

will be led by the development of this area. Therefore, the indicators are mainly based on the growth rates of GDP by National Development Plan (PND), INSTAT statistics (Tableau de Bord Economique, Avril 2017) and sectors' plans at the national level taking in consideration of the growth scenario for the Overall TaToM Area.

**Table 3.6.9 Real Growth Rates of GRDP of the Overall TaToM Area**

Country / Regions	2016-2023	2024-2028	2029-2033
Madagascar	5.6 %	7.7 %	7.9 %
3 Regions Covering the Overall TaToM Area	6.8 %	8.5 %	9.5 %
Analamanga	6.9 %	8.6 %	9.5 %
Atsinanana	6.1 %	8.2 %	9.5 %
Alaotra-Mangoro	5.6 %	7.6 %	8.7 %

Source: JICA Study Team

Table 3.6.10 illustrates the change of share of economic sector and growth rates by economic sector.

**Table 3.6.10 Future Economic Framework for the Overall TaToM Area**

**(a) Change of Share of Economic Sector**

	GRDP (MGA Billion, at 2007 constant prices)	GDP (USD Million, at 2010 constant prices)	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)
2014 (Actual)	8,154	5,018	6.5	19.8	73.7
2023 (Projected)	14,503	8,925	5.1	19.4	75.4
2028 (Projected)	21,812	13,423	4.6	20.1	75.3
2033 (Projected)	34,308	21,113	3.9	21.0	75.1

**(b) Growth Rates by Economic Sector**

	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)	Total (%)
2016-2023 (Projected)	4.5	6.2	7.1	6.8
2024-2028 (Projected)	6.0	9.3	8.5	8.5
2029-2033 (Projected)	6.0	10.5	9.4	9.5

**(c) Change of Share of GRDP**

	2014 (Actual)	2023 (Projected)	2028 (Projected)	2033 (Projected)
3 Regions Covering the Overall TaToM Area	47.0%	52.5%	54.6%	58.7%
Outside the 3 Regions Covering the Overall TaToM Area	53.0%	47.5%	45.4%	41.3%
Madagascar	100.0%	100.0%	100.0%	100.0%

**(d) Change of GDP per Capita**

	Unit	2014	2023	2028	2033
Total Population of the 3 Regions		5,683,080	7,286,638	8,286,628	9,388,468
GRDP of the 3 Regions Covering the Overall TaToM Area	MGA Billion, at 2007 constant prices	8,154	14,503	21,812	34,308
	USD Million, at 2010 constant prices	5,018	8,925	13,423	21,113
GDP per Capita for the TaToM Area	MGA, at 2007 constant prices	1,434,785	1,990,355	2,632,192	3,654,270
	USD, at 2010 constant prices	883	1,225	1,620	2,249
Annual Growth Rate of GDP per Capita at 2007 constant price		-	3.70%	5.75%	6.78%

Source: JICA Study Team

## 3.7 National Development Budget of Madagascar and Necessary Budget for TaToM

### 3.7.1 Madagascar's Development Budget

The revenue of Madagascar increased continuously and reached US\$ 2.113 billion in 2013. However, it dropped greatly between 2013 and 2017, and was only US\$ 1.292 billion in 2017. (See Table 3.7.1) Madagascar's overall development budget is considered to be approximately half of its national expenditures, which is US\$ 1 billion per year.

**Table 3.7.1 National Government Budget of Madagascar**

Year	Revenues	Expenditures:
2003	\$739.6 million	\$1.071 billion
2007	\$1.22 billion	\$1.555 billion
2008	\$1.612 billion	\$2.05 billion
2013	\$2.113 billion	\$2.356 billion
2017	\$1.292 billion	\$1.725 billion

Source: CIA World Factbook

In addition to increasing its revenues, the Madagascar government can also increase its development budget by increasing the amount of borrowing. However, this would cause the increase of the amount of public debt. As of January 2019, the total debt of Madagascar was US\$ 4.503 billion, which is equivalent to 36.7% of the country's GDP. International Monetary Fund (IMF) recommends that the ratio of public debt to GDP should not be higher than 40% for developing countries. Therefore, Madagascar needs to increase its GDP in order to raise the possible additional amount of public borrowing, for example, for purposes of implementing more infrastructure development projects.

In accordance with the economic framework of Madagascar prepared by Project TaToM, the GDP of Madagascar will become two times larger than the present in the next 15 years. As a result, the development budget of Madagascar government is expected to become two times larger.

### 3.7.2 Necessary Budget for Implementing TaToM

Priority projects identified by Project TaToM are listed in Table 3.7.2, Table 3.7.3 and Table 3.7.4. These priority projects are expected to be implemented in the next 10 years or so. The details of these priority projects are given in Chapters 6 through 11 for Antananarivo Agglomeration, Chapters 16 through 21 for Toamasina Agglomeration and Chapters 25 and 26 for TaToM Economic Axis. In addition, Chapter 13 and Chapter 22 show how these projects should be implemented in accordance with TaToM's development strategies.

The total cost necessary for implementing the high priority projects in Antananarivo Agglomeration is estimated to be US\$ 1,875 million. That for the high priority projects in Toamasina Agglomeration accounts for US\$ 420 million and for TaToM Economic Axis accounts for US\$ 443.5 million. The total amount of the costs for the Overall TaToM Area is US\$ 2,748 million, which is estimated to account for, at largest, 30% of the total national development budgets of the next 10 years. This estimated percentage would become smaller than 30% since the GDP is expected to grow two times larger than the present. By looking at the percentage of TaToM's total costs out of the national development budgets, it is considered that the priority projects of Project TaToM are implementable.

**Table 3.7.2 Necessary Budget for Implementing High Priority Projects of Antananarivo Agglomeration**

Project No.	Project Name	Cost (million USD)	Organisation in Charge
A-DC-01	Project for Capacity Development for Promotion and Coordination of Implementing the PUDI of Antananarivo Agglomeration	4	MAHTP
A-R-01	Project for Construction of 4-lane Road between Ankorondrano and Antsavatsava (Northern Road Section between NR4 and NR1) (Part of the Middle Ring Road including a Bridge crossing the Ikopa River)	60	MAHTP
A-R-02	Project for Construction of 4-lane Road between Ampitatafika and Antsavatsava (Southern Section between NR4 and NR1) (Part of the Middle Ring Road)	5	MAHTP
A-R-03	Project for Construction of Primary Arterial Road between NR4 and Tsarasaotra Road in Ankorondrano Primary Urban Centre	50	MAHTP
A-R-04	Project for Construction of a Flyover at Ankorondrano Intersection of Tsarasaotra Road and Marais Masay Road	40	MAHTP
A-R-05	Project for Construction of Ambodifasina – Sabotsy Namehana Section of the Outer Ring Road between Tsarasaotra Road and NR3	10	MAHTP

**The Project on Master Plan Formulation for Economic Axis of TaToM (Antananarivo-Toamasina, Madagasikara)**  
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A-R-06	Project for Construction of Soanierana - Sabotsy Namehana Section of the Outer Ring Road between NR3 and NR2	20	MAHTP
A-R-07	Project for Construction of Bypass Road of Ambohidratrimo Urban Sub-Centre	5	MAHTP
A-R-08	Project for Construction of Primary Arterial Road between Tana-Masoandro and Antsavatsava	10	MAHTP
A-R-09	Project for Construction of Flyover at Anosizato Intersection of NR4 and NR1	30	MAHTP
A-C-01	Project for Promotion of Development of Ankorondrano Primary Urban Centre Phase 1	54	MAHTP, PPP
A-C-02	Project for Promotion of Development of Ambodifasina Urban Sub-Centre	86	MAHTP, PPP
A-C-03	Project for Promotion of Development of Namehana Urban Sub-Centre	35	MAHTP, PPP
A-C-04	Project for Promotion of Development of Amoronakona Urban Sub-Centre	38	MAHTP, PPP
A-C-05	Project for Promotion of Development of Tanjombato Urban Sub-Centre	30	MAHTP, PPP
A-C-06	Project for Promotion of Development of Ampitatafika Urban Sub-Centre	57	MAHTP, PPP
A-C-07	Project for Promotion of Development of Tana-Masoandro Urban Sub-Centre	199	MAHTP, PPP
A-C-08	Project for Promotion of Development of Ambohidratrimo Urban Sub-Centre	16	MAHTP, PPP
A-I-01	Project for Rezoning to Mixed Development Areas which allow Clean Light Industries along the Tokyo Boulevard	63	MAHTP, MICA, PPP
A-I-02	Project for Development of Industrial and Logistics Areas in the Southern Area of Ambohimalaza	84	MAHTP, MICA, PPP
A-I-03	Project for Development of Industrial and Logistics Areas along Ambohimalaza - Sabotsy Namehana Section of the Outer Ring Road by Providing Access Roads, Water and Electricity	70	MAHTP, MICA, PPP
A-F-01	Project for Development of Multi-Modal Cargo Transport Terminal in Amoronakona for Antananarivo Agglomeration	20	MAHTP, MTTM, PPP
A-H-01	Project for Development of Social Housing Area in Ivato East		MAHTP
A-H-02	Project for Development of Fenoarivo South New Town	42	MAHTP, PPP
A-E-01	Project for Doubling the Capacity of Mandrozeza 2 Water Treatment Plant	68	JIRAMA
A-E-02	Project for Construction of Two Water Treatment Plants using Groundwater from Tana Plain		JIRAMA
A-E-03	Project for Construction of Water Treatment Plant in Laniera		JIRAMA
A-E-04	Project for Master Plan Formulation of Water Resources Development and Water Supply for Antananarivo Agglomeration	3	JIRAMA
A-E-05	Project for Construction of New Retention Dam in Miadanandriana	42	JIRAMA
A-P-01	Installation of New Transmission Lines <ul style="list-style-type: none"> <li>• 225kV transmission line (Sahofika hydropower station to Behenjy Substation)</li> <li>• 225kV transmission line (Antetezambato hydropower station to Behenjy Substation)</li> <li>• 225kV transmission line (Tana Sud 2 Substation to Behenjy Substation)</li> <li>• 225kV transmission line (Tana Nord 2 Substation to New Substation in Moramanga)</li> <li>• 138kV transmission line (Ranomafana hydropower station to Tana Sud 2 Substation)</li> <li>• 138kV transmission line (Mahitsy hydropower station to Tana Sud 2 Substation)</li> <li>• 63kV transmission line (Tana Sud 2 Substation to Tana Sud Substation)</li> </ul>	445	JIRAMA
A-P-02	Installation of New Substations <ul style="list-style-type: none"> <li>• 225kV/63kV Behenjy Substation</li> <li>• 225kV/138kV/63kV Tana Sud 2 Substation</li> </ul>	-	JIRAMA
A-P-03	Reinforcement of Existing Transmission Lines	14	JIRAMA
A-P-04	Reinforcement of Existing Substations		JIRAMA
A-P-05	Project for Rehabilitation and Upgrade of Distribution Network including Establishment of New Distribution Control Centre for Expansion and Rehabilitation of the Power Distribution System	19	JIRAMA
A-G-01	Project for Development of Ankorondrano Lake and Waterfront Park	5	MAHTP, APIPA, CUA
A-G-02	Project for Development of Ankazomanga Atsimo Lake and Waterfront Park	5	MAHTP, APIPA, CUA
A-G-03	Project for Development of Andavamamba Anatihazo II Lake and Waterfront Park	1	MAHTP, APIPA, CUA
A-W-01	Project for Development of Recycling Factory and Sanitary Final Disposal Site in Manandriana	7	SAMVA, PPP
A-W-02	Project for Development of Recycling Factory and Sanitary Final Disposal Site in Andoharanofotsy	7	SAMVA, PPP
A-W-03	Project for Formulation of Implementation Plan for Other Recycling Factories and Sanitary Final Disposal Sites	3	SAMVA
A-R-10	Project for Construction of Over Canal Road between Tanjombato and Ankorondrano	150	MAHTP
A-R-11	Project for Construction of Bypass Road of NR3 (between the Outer Ring Road and the Middle Ring Road)	30	MAHTP

A-R-13	Project for Construction of Extension of Tsarasaotra Road between Ambodifasina Urban Sub-Centre and Ambatolampy Tsimahafotsy Suburban Centre	7	MAHTP
A-R-15	Project for Construction of Primary Arterial Road between Andranonahoatra and the Outer Ring Road	10	MAHTP
A-R-16	Project for Construction of Primary Arterial Road between Bypass Road of NR4 and Ampangabe Suburban Centre (through Tana-Masoandro)	80	MAHTP
A-R-12	Project for Construction of Anosiala - Ambatolampy Tsimahafotsy Section of the Outer Ring Road (Northern Part)	15	MAHTP
A-R-14	Project for Construction of East-West Primary Arterial Road between NR3 and Bypass Road of NR4	25	MAHTP
A-R-17	Project for Construction of Alakamisy Fenoarivo - Ampangabe Section of the Outer Ring Road (Western Part)	20	MAHTP
TOTAL		1,879	-

Source: JICA Study Team

**Table 3.7.3 Necessary Budget for Implementing High Priority Projects of Toamasina Agglomeration**

Project No.	Project Name	Cost (million USD)	Organisation in charge
T-DC-01	Project for Capacity Development for Promotion and Coordination of Implementing the PUDI of Toamasina Agglomeration	1	MAHTP
T-R-01	Project for Construction of Port Access Road for Construction for Toamasina Port Expansion	9	MAHTP
T-R-02	Project for Construction of Urban Arterial Road in Toamasina West	20	MAHTP
T-R-03	Project for Construction of Urban Arterial Roads in Toamasina South	40	MAHTP
T-R-04	Project for Widening of NR5 to 4-Lane Road between Toamasina Airport and the Junction of NR2 & NR5	20	MAHTP
T-C-01	Project for Promotion of Development of Toamasina Primary Urban Centre Phase 1	10	MAHTP, PPP
T-C-02	Project for Promotion of Development of Ankirihiry-Mangarivotra Secondary Urban Centre	5	MAHTP, PPP
T-C-03	Project for Promotion of Development of Toamasina South Service Centre	3	MAHTP, PPP
T-C-04	Project for Promotion of Development of Toamasina North Service Centre	2	MAHTP, PPP
T-I-01	Project for Designation of Industrial Development Zones and Investment Promotion for Industry in Toamasina Agglomeration Phase 1	1	MAHTP, MICE EDBM
T-T-01	Project for Toamasina (Miami) Sea Waterfront Development along the Toamasina Bay)	9	MAHTP, MTTM
T-T-02	Project for Designation of Tourism Development Zones and Investment Promotion for Tourism in Toamasina Agglomeration Phase 1	1	MAHTP, MTTM, EDBM
T-E-01	Project for Construction of Second Toamasina Water Treatment Plant by In-Taking of Ivoloia River Water	68	JIRAMA
T-P-01	Project for Installation of Transmission Line between Antananarivo and Toamasina	80	JIRAMA
T-R-10	Project for Construction of Third Access Road to Toamasina Port	30	MAHTP
T-R-11	Project for Construction of Toamasina Western Bypass	35	MAHTP
T-I-02	Project for Promotion of Development of Industrial Areas in the South of Toamasina Agglomeration Phase 1	35	MAHTP, MICA, EDBM, PPP
T-I-03	Project for Designation of Industrial Development Zones and Investment Promotion for Industry in Toamasina Agglomeration Phase 2	1	MAHTP, MICA, EDBM
T-T-03	Project for Designation of Tourism Development Zones and Investment Promotion for Tourism in Toamasina Agglomeration Phase 2	1	MAHTP, PPP
T-E-02	Project for Construction of Water Treatment Plant by In-taking of Ivondro River Water	68	JIRAMA
T-P-02	Project for Volobe Hydropower Station II	-	JIRAMA, PPP
T-P-03	Project for Strengthening of Power Distribution Network to Toamasina Southern Industrial Area	1	JIRAMA
TOTAL		421	

Source: JICA Study Team

**Table 3.7.4 Necessary Budget for Implementing High Priority Projects of TaToM Economic Axis**

Project No.	Project Name	Cost (million USD)	Organisation in Charge
E-DC-01	Capacity Development for Commune Officers along TaToM Economic Axis for Promoting TaToM Development Strategies	1.5	MAHTP, MID
E-R-01	Project on Replacement of Two Bridges along National Road No. 2	30	MAHTP
E-R-02	Project for Improvement of Traffic Safety on National Road No. 2	20	MAHTP
E-R-04	Project for Construction of Climbing Lane in Steep Slope Sections between Moramanga and Brickaville on National Road No.2	200	MAHTP
E-R-05	Project for Construction of Climbing Lane in Steep Slope Sections between Antananarivo and Moramanga of National Road No.2	75	MAHTP
E-R-06	Project for Construction of Moramanga Bypass Road	20	MAHTP, PPP
E-F-01	Project for Rehabilitation of Antananarivo - Toamasina Railway	105	MAHTP, PPP
	TOTAL	443.5	

Source: JICA Study Team

# PART III

## REVISED PUDI FOR ANTANANARIVO AGGLOMERATION



## **Chapter 4 Present Situation and Challenges on Urban Development and Housing Development in Antananarivo Agglomeration**

### **4.1 Present Situation on Urban Development in Antananarivo Agglomeration**

#### **4.1.1 Spatial Analysis of Present Urbanization of Antananarivo Agglomeration**

An urban structure for Antananarivo Agglomeration defines the direction of development. It is related to the other sectoral strategies which are described in the later chapters. The following items for spatial analyses are examined in order to formulate an urban structure.

##### **(1) Present Spatial Characteristics of Antananarivo Agglomeration**

###### **1) Urban Centres within CUA**

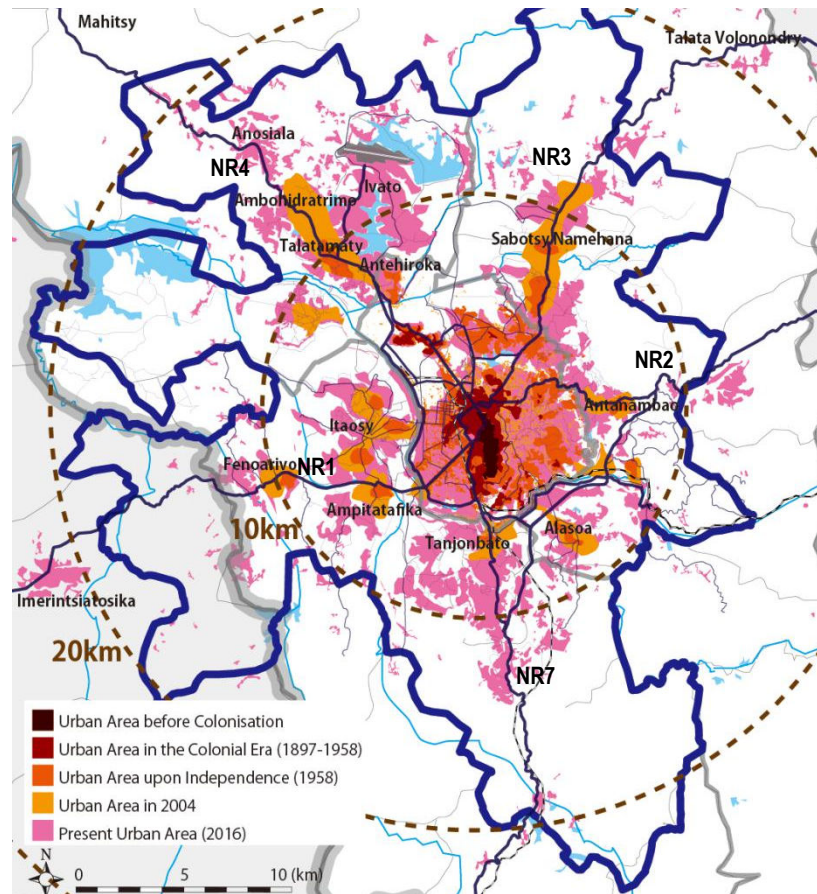
CUA has four centres with the following characteristics.

- **Anosy:** The surrounding area of Lac Anosy (Anosy Lake) is a central government centre not only for CUA but also for the nation. Government buildings are located especially in the south-west of the Anosy Lake. Mahamasina Stadium and other public facilities are also located in this area. A highrise building of the Hotel Carlton is located as a landmark in this area. Originally, Antananarivo started from the top of the hill where Rova is located. Anosy Lake was constructed for irrigation purposes, but the area was transformed into an administrative centre in the 19<sup>th</sup> century.
- **Analakely:** Analakely Area is a commercial centre of Antananarivo Agglomeration. This commercial centre is composed of Independence Avenue, which is a commercial area, and Analakely Market, which is a central market of the city.
- **Antaninarenina:** Antaninarenina has been the politics and finance centre in Antananarivo City. It is located on the hill between Analakely and Anosy, and the presidential Palace and several banks are located there.
- **Ankorondorano:** This is a new urban centre within CUA, located approximately 3.5 km north of Anosy Lake. Some new office buildings accommodating corporate headquarters are located in this area. Former buildings for industry are transformed into these modern office buildings.

###### **2) Urban Expansion and Suburbanization in Antananarivo Agglomeration**

Antananarivo's urbanization started from the hill where Queen's Palace is located, and urbanised areas have gradually expanded towards its surrounding areas. Figure 4.1.1 shows the historical expansion of urban areas within Antananarivo Agglomeration.

Antananarivo Agglomeration has hills, paddy fields and wetlands. This topographic condition determined the urbanization pattern of CUA. Around 1960, the urbanised areas were still on the several hills in the agglomeration. In recent years, urbanised areas have been expanded by filling wetlands. These urbanizations have happened without planning control or proper infrastructure development. It caused increasing risks of flooding or inundation and declining living conditions.



Source: JICA Study Team

Figure 4.1.1 Urban Expansion of Antananarivo Agglomeration

Generally, these urbanizations are noticeable, especially along the major national roads. The areas between the national roads are still not urbanised. Urbanization patterns along the national roads are described as follows.

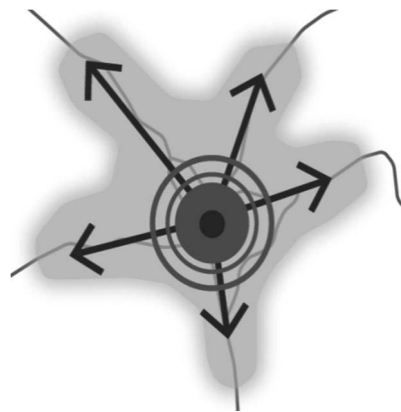
- **To the west along National Road No.1 (NR1):** Areas between the centre of Antananarivo and Ikopa River, 3km from the centre, are urbanised already by reclaiming the wetland. Island-like hill lands of Itaosy (north of the NR1) and Ampitatafika (South of the NR1) located just after the river are already urbanised. Then, the NR1 crosses a large wetland along Sisaony River, 9km from the centre. Then there is a town called Fenoarivo, which seems to be an edge of the agglomeration. After Fenoarivo, rural areas are dominant.
- **To the east along National Road No.2 (NR2):** East of the agglomeration are hilly lands. The areas are continuously urbanised up to Antanambao, 8km from the centre. Some constructions have been built around the junction of the NR2 and Tokyo Boulevard, but this area seems to be the limit of urbanization. After the junction, the NR2 is running through rural areas and entering mountainous areas.
- **To the north-east along National Road No.3 (NR3):** North-east of the agglomeration is also hilly, and the NR3 is crossing some hills and wetlands. Ribbon-shaped urbanizations are found along the NR3, and the following towns are located in the area; Ambohitrahaha (6km from the centre), Sabotsy-Namehana (10km from the centre), and Ambohitrinimanga (12km from the centre). Beyond that, the areas become rural.
- **To the north-west along National Road No.4 (NR4):** North-west of the agglomeration, high-density urbanizations continue till 3km from the centre along the NR4, up to Andraharo where industrial areas are located. Then, there is an island-like area of Ambohimananarina which is

fully urbanised. The NR4 is crossing a wetland, and reaching to the areas of Antehioka (8km from the centre), Talatamaty, Ivato where the international airport is located, and Ambohidratorimo (15km from the centre). This area is also a major urbanised area of the agglomeration. Then, the NR4 passes through Anosiala, where many factories are located. After Anosiala, NR4 enters a rural area after passing a golf course.

- **To the south along National Road No.7 (NR7):** Areas between the centre of Antananarivo and the bridge crossing the Ikopa River, located 4 km south of the city centre, are fully urbanised. The area just south of Ikopa River is called Tanjombato. This area is becoming a sub-centre by attracting business functions into its existing industrial areas. Urbanised areas continue until the junction of Tokyo Boulevard, 10km to the south of the city centre. After the junction, rural areas dominate the land use. Tsiafahy town is located 18km to the south of the city centre. After the town, the NR7 crosses the Sisaony River, which could be considered the boundary of Antananarivo Agglomeration.

### 3) Mono-Centric Urban Structure and Poorly Developed Suburban Centres

At present, Antananarivo Agglomeration has a mono-centric spatial structure. Most of the major administrative, business, commercial and social functions are concentrated within CUA. Urbanization follows major national roads, which run radially from the city centre to surrounding areas. Although there are some market towns in suburban areas, they have been poorly equipped with urban functions and basic infrastructure. This concentrated pattern of urban functions tends to cause heavy concentration of traffic, resulting traffic congestion on radial national roads to CUA.

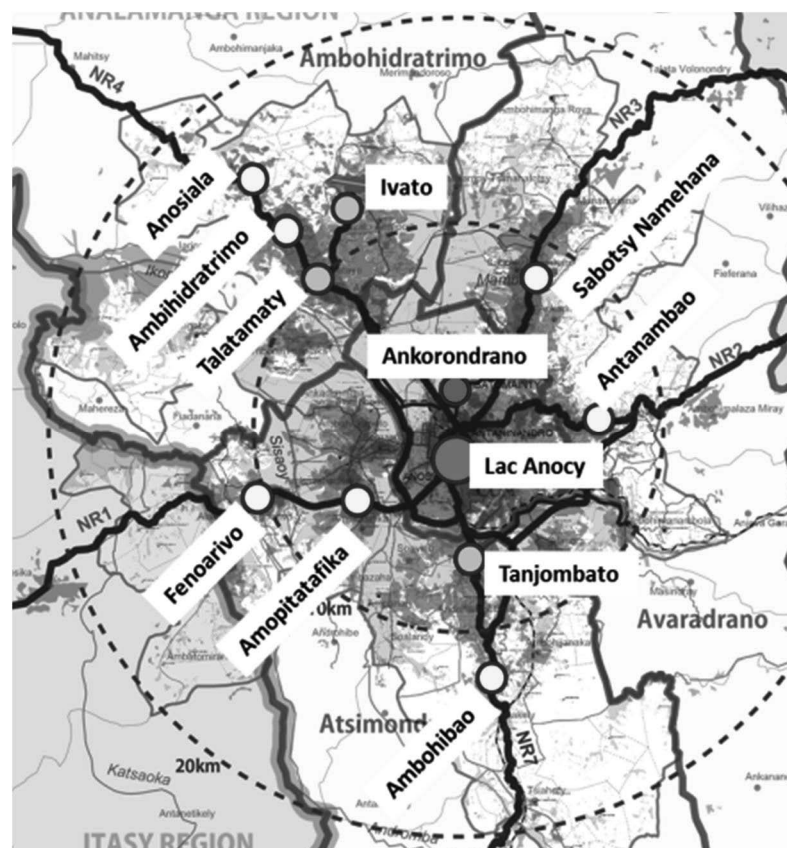


Source: JICA Study Team

**Figure 4.1.2 Simplified Existing Urban Structure in Antananarivo Agglomeration**

### 4) Potential Suburban Centres

Due to rapid suburban growth, some towns are getting larger and they become potential urban centres as shown in Figure 4.1.3. Several cities have been growing rapidly and serving some commercial and public functions, such as market places, shops and public services in suburban areas. Most of these centres are located along the national roads and have a good connectivity with the city centre of Antananarivo.



Source: JICA Study Team

**Figure 4.1.3 Potential Urban Centres in Antananarivo Agglomeration**

## (2) Existing Land Use Distribution

A present land use map for Antananarivo Agglomeration has been developed by the JICA Study Team by interpreting the satellite imagery of World View 2 taken in 2016.

The present land use map clearly shows urbanization patterns of Antananarivo Agglomeration. Urbanizations are taking place in paddy fields and swamplands, and at the same time, urbanizations are limited by paddy fields and swamplands. 35% of the total lands of the agglomeration are wetland or paddy field.

The total urbanised area is 164 km<sup>2</sup>, which is 21% of the agglomeration. The majority of the urbanised areas are residential. While 56% of the lands in CUA are urbanised, the other districts are still less urbanised; only 16 - 19% are used for urban purposes.

Commercial or business type of land uses are mainly found within CUA. Some shopping centres are located along major roads. Many small retail shops are along roads in the agglomeration, and most of them are counted as “Residential” as a part of a residential building is used for a commercial purpose.

Administrative uses are found south of Lac Anosy, where central government offices are located. While 3.7% of the total lands of CUA are dominant for government buildings, other districts have very few administrative uses.

A large extent of industries is located in Tanjombato, on both sides of the Ikopa River. In Ankorondorano, along the National Roads 1 and 4, there are some factories. Apart from that, a few large scale industrial areas are found in the agglomeration.

There are huge wetlands in the northern and western parts of Antananarivo Agglomeration. It is also clear that the southern parts of Ivato Airport are also highly urbanised, namely Ivato and Talatamaty. Outside the built-up areas are composed of grass lands or cultivated lands. Only limited areas are forests.

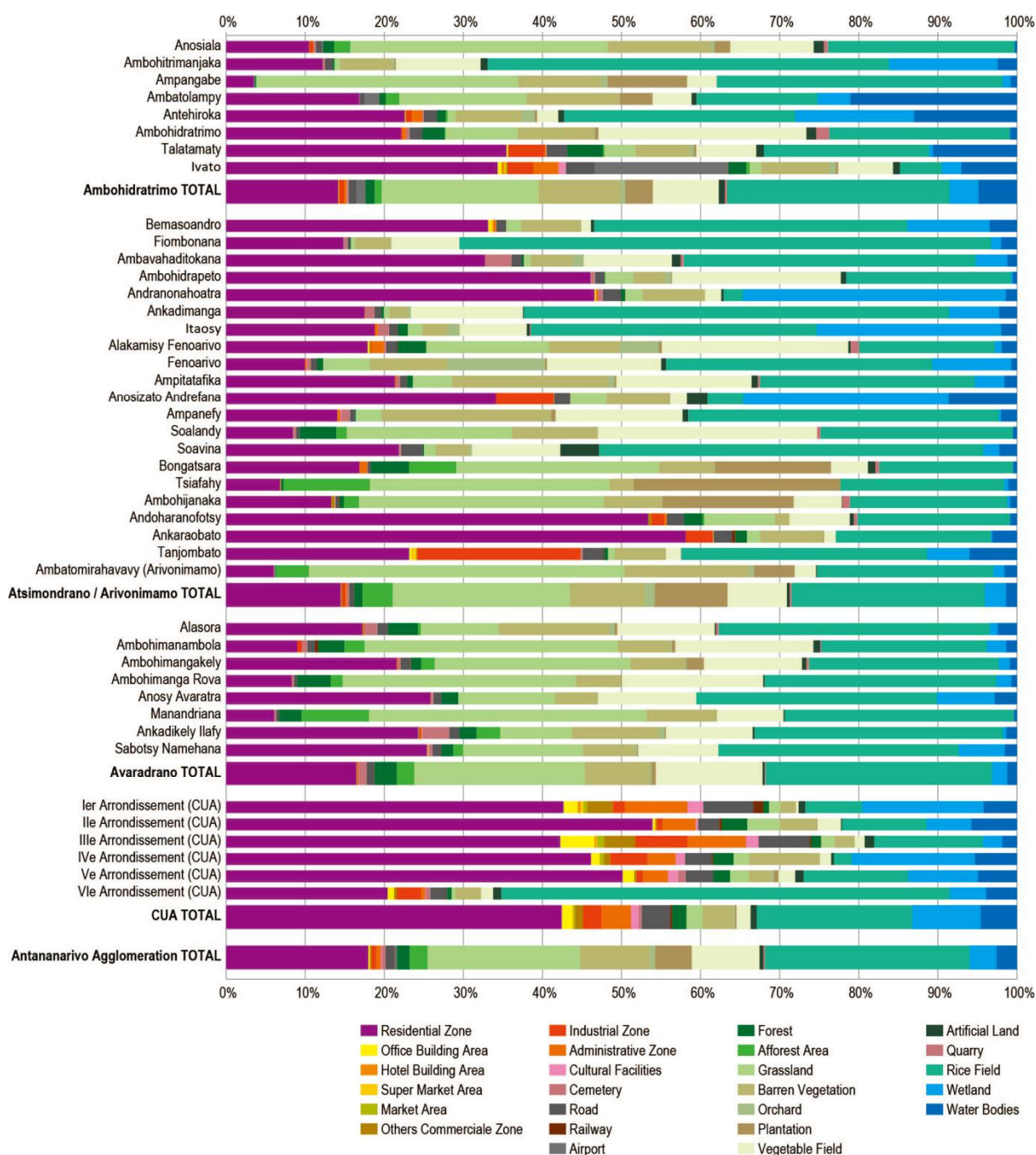
Agricultural use accounts for 40% of the agglomeration, which is composed of mainly rice fields (26%) and vegetable fields, etc. (14%).

Table 4.1.1 shows the land use pattern by district, Figure 4.1.4 shows the proportion of land use pattern by commune, and Figure 4.1.5 shows the land use map for Antananarivo Agglomeration.

**Table 4.1.1 Land Use Pattern of Antananarivo Agglomeration by District**

Land Use Category	8 communes in Ambohidratrimo District (ha)		20 communes in Atsimondrano District and 1 commune in Arivonimamo District (ha)		8 communes in Avaradrano District (ha)		CUA (Antananarivo Renivohitra District) (ha)		Antananarivo Agglomeration TOTAL (ha)	
Residential Zone	2,710.0	14.05%	4,425.7	14.71%	3,204.9	16.91%	3,620.6	42.88%	13,961.1	18.19%
Office Building Area	7.1	0.04%	6.7	0.02%	1.1	0.01%	108.6	1.29%	123.4	0.16%
Hotel Building Area	3.5	0.02%	0.2	0.00%	0.0	0.00%	5.2	0.06%	8.9	0.01%
Super Market Area	2.1	0.01%	3.2	0.01%	0.0	0.00%	13.2	0.16%	18.6	0.02%
Market Area	1.4	0.01%	0.4	0.00%	1.2	0.01%	16.5	0.20%	19.4	0.03%
Others Commercial Zone	3.7	0.02%	20.1	0.07%	6.0	0.03%	80.8	0.96%	110.6	0.14%
Industrial Zone	124.5	0.65%	128.8	0.43%	29.6	0.16%	198.0	2.34%	480.8	0.63%
Administrative Zone	65.0	0.34%	62.7	0.21%	7.0	0.04%	309.7	3.67%	444.4	0.58%
Cultural Facilities	9.0	0.05%	2.6	0.01%	3.9	0.02%	69.9	0.83%	85.4	0.11%
Road	190.1	0.99%	168.9	0.56%	181.5	0.96%	312.5	3.70%	853.0	1.11%
Railway	0.0	0.00%	6.0	0.02%	9.8	0.05%	20.0	0.24%	35.8	0.05%
Airport	219.2	1.14%	0.0	0.00%	0.0	0.00%	0.0	0.00%	219.2	0.29%
<b>Urbanized Areas</b>	<b>3,335.4</b>	<b>17.29%</b>	<b>4,825.2</b>	<b>16.04%</b>	<b>3,445.0</b>	<b>18.18%</b>	<b>4,755.1</b>	<b>56.32%</b>	<b>16,360.7</b>	<b>21.31%</b>
Cemetery	32.6	0.17%	84.6	0.28%	192.2	1.01%	34.0	0.40%	343.5	0.45%
Forest	222.4	1.15%	324.5	1.08%	519.5	2.74%	166.2	1.97%	1,232.6	1.61%
Afforest Area	170.0	0.88%	1,164.2	3.87%	415.1	2.19%	1.5	0.02%	1,750.8	2.28%
Grassland	3,808.4	19.74%	6,665.8	22.16%	3,988.4	21.05%	173.5	2.05%	14,636.0	19.07%
Barren Vegetation	2,030.0	10.52%	2,834.1	9.42%	1,597.2	8.43%	335.1	3.97%	6,796.5	8.85%
Orchard	110.4	0.57%	349.8	1.16%	51.3	0.27%	10.9	0.13%	522.4	0.68%
Plantation	670.9	3.48%	2,637.6	8.77%	102.2	0.54%	17.5	0.21%	3,428.2	4.47%
Vegetable Field	1,672.4	8.67%	2,264.4	7.53%	2,635.6	13.91%	148.1	1.75%	6,720.4	8.75%
Artificial Land	148.1	0.77%	110.1	0.37%	53.4	0.28%	65.4	0.77%	377.0	0.49%
Quarry	48.9	0.25%	74.9	0.25%	18.8	0.10%	0.0	0.00%	142.5	0.19%
Rice Field	5,409.9	28.05%	7,434.2	24.71%	5,342.3	28.20%	1,638.3	19.40%	19,824.7	25.82%
Wetland	701.8	3.64%	849.3	2.82%	355.8	1.88%	713.6	8.45%	2,620.4	3.41%
Water Bodies	929.0	4.82%	466.4	1.55%	230.8	1.22%	383.8	4.55%	2,010.0	2.62%

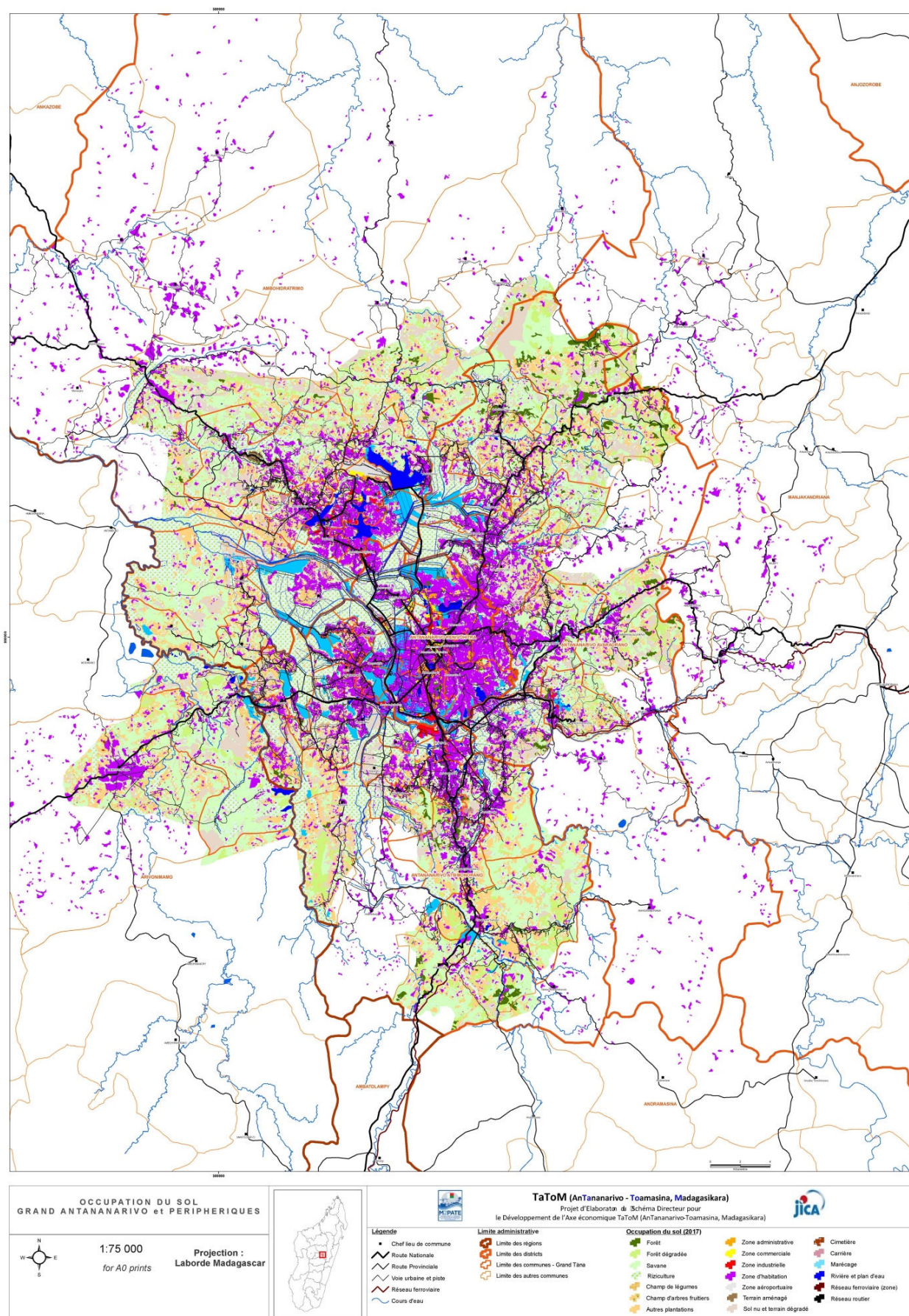
Source: JICA Study Team interpreting the satellite imageries taken in 2016



Source: JICA Study Team interpreting the satellite images taken in 2016

Figure 4.1.4 Proportion of Land Use Pattern of Antananarivo Agglomeration by Commune





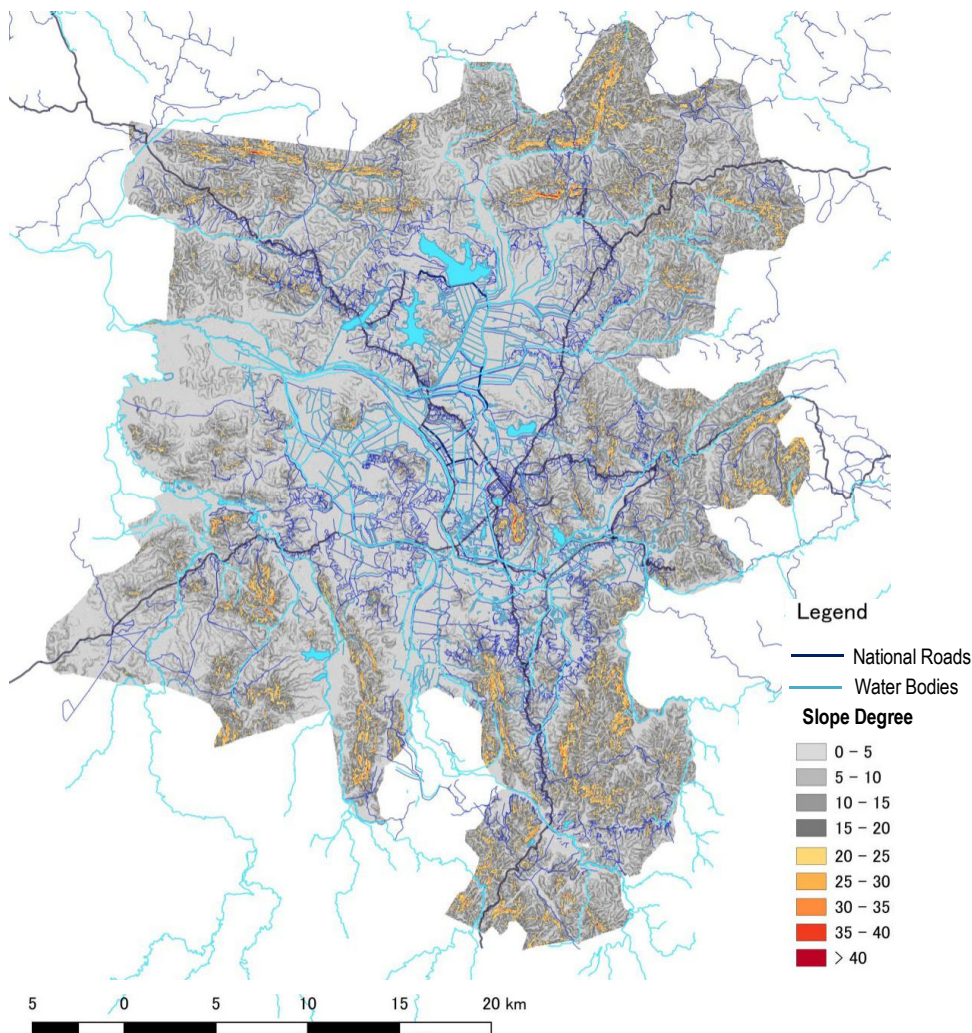
Source: JICA Study Team interpreting the satellite images taken in 2016

**Figure 4.1.5 Present Land Use Map in Antananarivo Agglomeration**



### (3) Analysis for Slope Lands

Antananarivo Agglomeration has rich topographies, and is surrounded by hills. Figure 4.1.6 shows the degree of slopes. It clearly shows that ridges of hills have steep slopes more than 20 degrees and undulated lands are found in the northern, eastern, and southern areas. A steel slope land is not suitable for urbanization, and it is difficult to cross the ridges by road and rail transport. A future urban structure and land use plan need to consider these topographic conditions.



Source: JICA Study Team

Figure 4.1.6 Slope Gradient of Antananarivo Agglomeration

## 4.1.2 Characteristics and Problems on Urban Development of Antananarivo Agglomeration

In this section, characteristics and problems on urban development in Antananarivo Agglomeration are identified and discussed. Their descriptions are divided into economic sectors, habitation, life infrastructure and services, disaster risk reduction and identity.

### (1) Characteristics and Problems on Economic Sectors in Antananarivo Agglomeration

In Antananarivo Agglomeration, economic sectors have not been sufficiently developed so that it cannot generate enough employment opportunities for the large number of population.

- Because there is no economic sector that leads the economy of the large agglomeration with an urban population of nearly 3 million, many people are engaged in informal jobs.
- The Region of Analamanga has **15.3% of the national population** in 2014 and produces **42.6% of GDP**. Its per capita income is about 2.8 fold of the national average. It cannot be



said that the economic sectors have sufficiently developed as the national capital region that is supposed to be the driving force of the entire national economy.

**Table 4.1.2 Per Capita GDP and Poverty Rate**

Indicators	Madagascar	Analamanga Region
Per Capita GDP (2015)	USD 402	USD 1,120
Poverty Rate (2012)	71%	47%

Source: INSTAT

Business support functions of Antananarivo Agglomeration are still weak in promoting the development of economic sectors for Antananarivo Agglomeration and other regions.

- Business support functions (including administrative and management, financing, accounting and legal services, logistics, ITC, marketing, research & development,) of Antananarivo Agglomeration are too weak to support the promotion of economic development. Business support functions cannot be developed without a good urban environment, such as transport infrastructure, power supply, water supply, and ICT. These basic infrastructures for business support functions are lacking in Antananarivo.
- In Antananarivo, modern urban centres have not been developed for accommodating national or regional headquarters of multinational corporations. The Ankondrano area has been transformed into an urban centre for business with the construction of modern high-rise office buildings.

In Antananarivo Agglomeration, land for manufacturing and logistics industries is lacking inside and outside CUA.

- The urban structure of Antananarivo Agglomeration is shaped by the National Roads radiating outward from the centre of Antananarivo. With the expansion of the urban area, factories and logistics facilities have been developed along the radial National Roads. Because of the rapid urbanization, the land for industry use is getting scarce.

The logistics function in Antananarivo Agglomeration is inefficient so that it cannot support the development of the economic sectors.

- Transport in Antananarivo Agglomeration is inefficient and costly. This is partly because the import of basic goods relies on truck transport on a 350km length of NR No. 2 from the Port of Toamasina to Antananarivo, and partly because the road traffic is chronically congested within Antananarivo Agglomeration.
- Because of the dependency on the inefficient and costly logistics function, Antananarivo Agglomeration is not so attractive for investors and establishments of economic sectors.

## **(2) Characteristics and Problems on Habitation in Antananarivo Agglomeration**

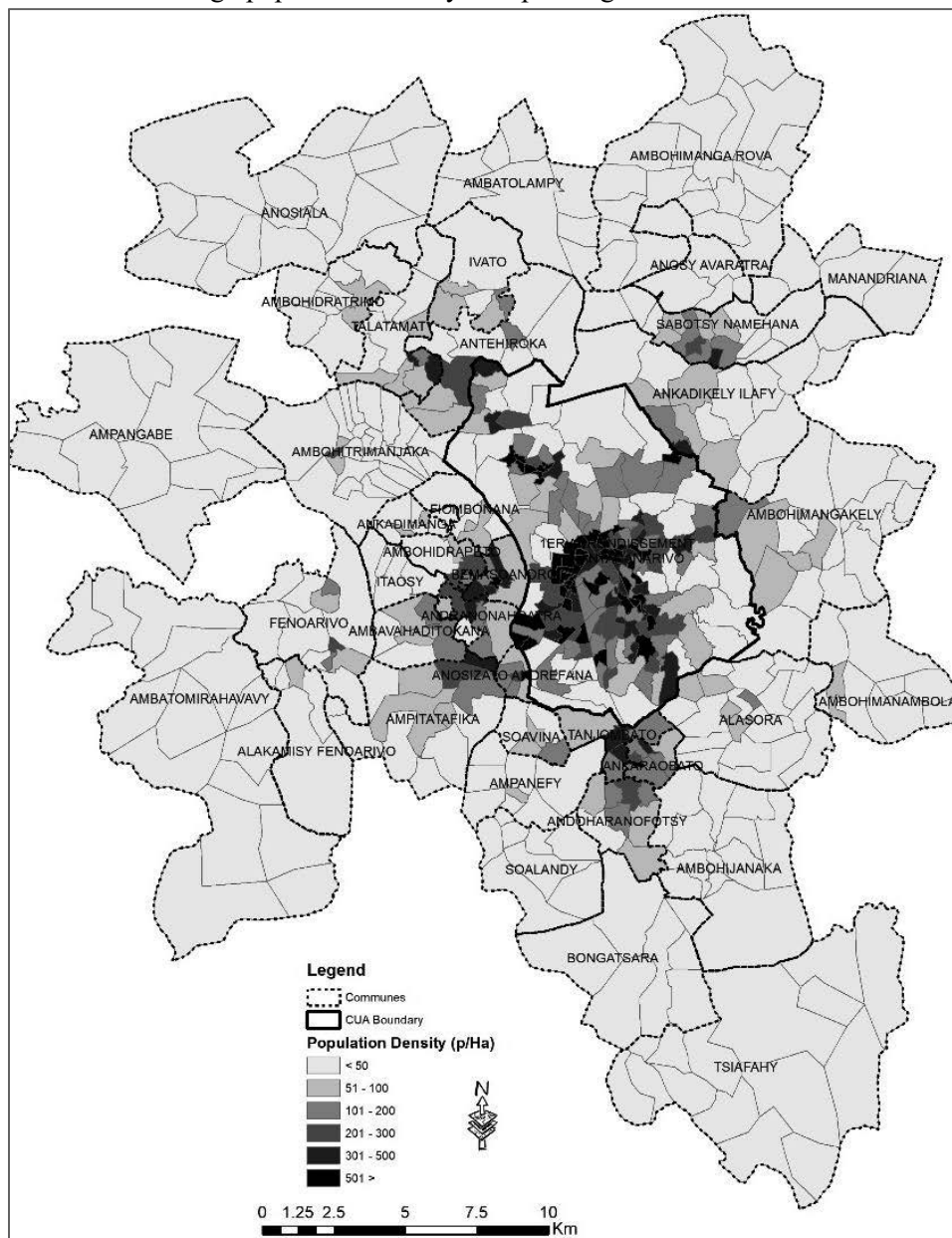
Many urban functions and population are over concentrated within CUA. As a result, serious traffic congestion disrupts economic and social activities in Antananarivo.

- Establishments of services and industries and their jobs are concentrated in CUA.
- Public service functions to support daily life are concentrated in CUA, including education and health facilities.
- As a result, traffic is concentrated in CUA, causing traffic congestion. In particular, severe traffic congestion is occurring on five radial National Roads connecting the inside of CUA and the outside of CUA.
- The population is concentrated in CUA and the population density is extremely high with the

population density around 175 person/ha, while the population density of Antananarivo Agglomeration is only around 35 person/ha. On the other hand, land is limited for urbanization in CUA, and the urban areas have been expanded by filling in wetlands.

Due to the extremely high population density, a healthy living environment is not maintained in some areas in CUA

- There are high density areas where population density per fokontany reaches 500 people / ha. In such high population density areas, the road density is very low, the drainage is poor, and water kiosks are far away. Their living environment is being degraded and those areas are expanding.
- The area with high population density is expanding in some areas outside CUA as well.



Source: JICA Study Team based on data from INSTAT

**Figure 4.1.7 Population Density of Antananarivo Agglomeration per Fokontany (2018)**

There is an issue with sanitation in CUA because the population density is very high and sewerage treatment is not properly done.

- In CUA, the population density is very high and black water is thrown away on roads and discharged to canals without proper sewerage and waste water treatment.
- During the rainy season, black water is widespread to all over the urban areas by rain water, while during the dry season, the waste gets dry and is diffused into the air with dust.
- In this sense, CUA is not a modern, sanitary city.
- CUA has a wastewater collection system of a total length of approximately 175km. The combined sewer system is available in only the 1<sup>st</sup> and 3<sup>rd</sup> arrondissement that covers 17% of CUA's population.

Because of underdeveloped public transportation, the mobility in urban life is constrained and travelling results in loss of time. Travelling is sometimes dangerous.

- Taxi-be, which is a dominant public transport mode used by the residents, is not convenient to move around the city. People have to spend a lot of time for travelling by taxi be and face the risks of traffic accidents and pickpocketing.
- As a result, the productivity declines, and the quality of life is also deteriorating in Antananarivo Agglomeration.

Housing provision is inadequate in terms of quantity and quality, compared with the rapid population growth in Antananarivo Agglomeration

- Insufficient provision of land equipped with infrastructure is one of the reasons of shortage of housing provision.
- Land registration information is occasionally inaccurate. People are discouraged to apply for construction permit. It is because it takes time since an unknown land owner other than the registered owner might exist. Thus, it is difficult to obtain loan and mortgage for purchase of land and construction of housing from financial institutions.
- As a result, real estate industry for residential area development and construction of housing has not developed much.

Urban amenities, such as parks and open space, is lacking both inside and outside CUA in Antananarivo Agglomeration.

- Wetland and vacant lands are decreasing; therefore, open space is declining inside and outside CUA.
- As a result, the congested urban space is expanding.

### **(3) Characteristics and Problems on Infrastructure and Services for Supporting People's Life**

Water Supply: The water supply master plan formulated in 2003 does not intend to provide water for the current entire population of Antananarivo Agglomeration. Current water production is insufficient. Water resource development and a water treatment plant are necessary for water supply targeting the outside of CUA for promoting suburbanization.

- JIRAMA's water supply area is currently limited to part of the Antananarivo Agglomeration. Access rate to urban water supply in JIRAMA's water supply area in 2015 is only 44.0%.
- The capacities of water supply facilities, such as pipelines, reservoirs and pumping stations, are insufficient to cover the potential demand of the present population in Antananarivo Agglomeration
- There is a large gap in population projection in 2033 between the JIRAMA's water supply area and TaToM. The population served by JIRAMA is projected to be only 2.28 million in 2033. JIRAMA's plan does not consider the rapid urbanization and population growth in suburban areas.

Power Supply: If PAGOSE project is implemented, the power generation can satisfy the potential demand. However, facility development for distribution of electricity is urgently needed. In particular, development of transmission and distribution facilities to the urbanized areas outside CUA is necessary.

- The total power generating capacity is expected to meet the peak demand from 2020 provided that all the planned power stations are constructed on schedule.
- The current transmission system and distribution system do not meet the load and need to be expanded in the future, considering that the future power demand in 2033 becomes 3.2 times of that in 2016.
- A significant number of outages and high distribution losses occur.

Education Facilities: The classrooms of public primary and secondary schools are lacking in CUA, while the classrooms of public secondary and high school are not enough outside CUA.

- Compared with the population growth in Antananarivo Agglomeration, public educational facilities are lacking and 60 to 70% of the students are enrolled in private schools.
- In particular, the classrooms of public primary and secondary schools are lacking in CUA, while the classrooms of public secondary and high school are not enough outside CUA.
- Recently, the education performance of Madagascar has declined and Madagascar is among the countries with lowest scores. Thus, the education quality should be improved by developing educational facilities.

Health Service Facilities: Public CSBs are insufficient in populated CUA and its adjacent areas. There is a problem with the quality of medical services of public hospitals.

- Public CSBs are lacking in CUA and communes adjacent to CUA, compared with their population. In suburban areas, there is no public CSB in some communes.
- Health professionals such as doctors, nurses, and midwives are not enough.
- Though public hospitals are planned to be developed in each district outside CUA, the quality of medical service is low, compared with the private hospitals.

#### **(4) Characteristics and Problems on Disaster Risk Reduction**

Risk for inundation due to rainfall flooding is rising in CUA partly because the decline of wetlands and paddy fields deprives CUA of water retaining function and partly because the mal-maintenance of drainage facilities decreases the capacity of draining of water from CUA.

- The government has used wetlands for the construction of roads and other urban infrastructure in order to enhance urban functions.
- Meanwhile, wetlands are filled little by little along with the population growth of CUA

The risk of river flooding is increasing outside CUA partly due to the decrease of paddy fields by filling in with land for the expansion of urban areas and partly due to the deterioration of irrigation canals.

- The productivity of irrigated paddy fields tends to decline because irrigation facilities are not well maintained and water management is not well done. Those irrigated paddy fields have been gradually transformed into urban land use. As a result, the risk of river flooding is rising in the outside of CUA.
- Meanwhile, the landscape of paddy fields is degrading and disappearing.

## (5) Characteristics and Problems on Identity

The physical environment (in other words, landscape) which reflects the traditional identity of Antananarivo and its surrounding areas has been disappearing in the urbanization in Antananarivo Agglomeration

- Due to the rapid population growth and expansion of urbanized areas, the landscape of Antananarivo and surrounding areas are rapidly changing. The beauty of the landscape of hills and paddy fields which the residents are familiar with for a long time are at the verge of deterioration.



Source: JICA Study Team

Figure 4.1.8 Landscape reflecting Identity of Antananarivo and its Surrounding Areas

## 4.2 Present Situation on Housing Development in Antananarivo Agglomeration

### 4.2.1 Housing Situation in Antananarivo Agglomeration

#### (1) Buildings by Use in Antananarivo Agglomeration

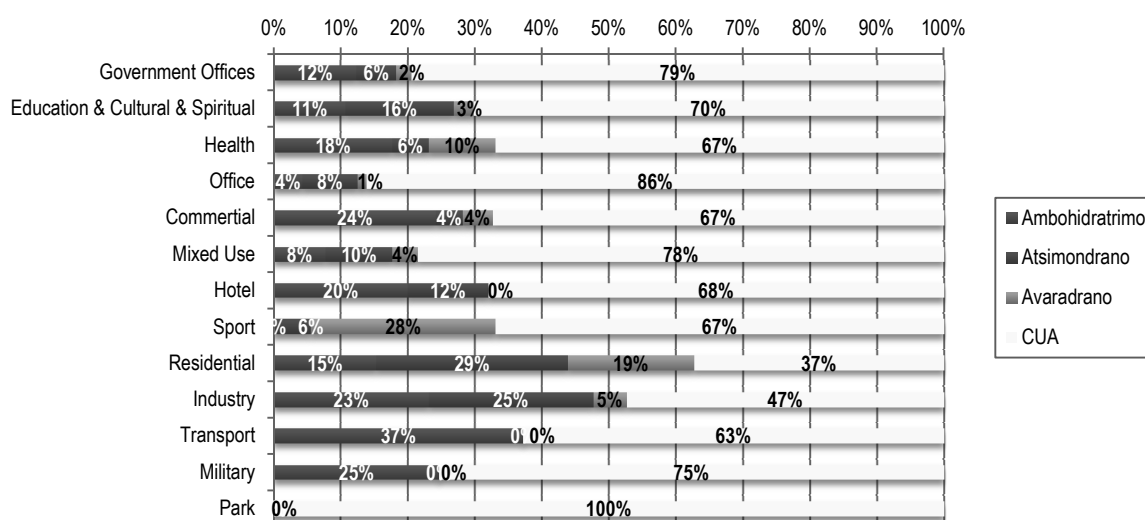
As presented in Table 4.2.1, there were 427,309 buildings in Antananarivo Agglomeration in 2016. Nearly 40% of them were located in CUA, followed by 28% in the eight communes of Atsimondrano District, 18% in the 20 communes of Avaradrano District, and 15% in the eight communes of Ambohidratrimo District. Almost all buildings were for residential use. On the average figure for the agglomeration, the residential buildings reached 96% of the total number of buildings.

On the other hand, some variations can be observed in the distribution of buildings by use, as shown in Figure 4.2.1. Despite its largest population, CUA only hosted about 40% of the residential buildings. This means that the communes in the three districts provide dwellings for the majority of residents in Antananarivo Agglomeration. In addition, more than half of the buildings for industry use also existed in the three districts. Tanjombato in Atsimondrano, and Talatamaty and Ivato in Ambohidratrimo accommodated a large number of buildings for industry use, although 4th Arrondissement had indeed the largest number of such structures. There were also a good number of this building type in 6th and 3rd Arrondissements. Meanwhile, 37% of transport-related facilities were located in Ambohidratrimo District, where also almost 25% of commercial facilities were found. This could probably be due to the existence of Ivato Airport in this area. On the other hand, 28% of sports facilities existed in the Avaradrano District.

**Table 4.2.1 Buildings by Use per District in Antananarivo Agglomeration in 2016**

Building Use	District	8 Communes of Ambohidratrimo		20 Communes of Atsimondrano		8 Communes of Avaradrano		Antananarivo Renivohitra (CUA)		TOTAL Antananarivo Agglomeration	
		No.	Share	No.	Share	No.	Share	No.	Share	No.	Share
Government Offices		218	0.33%	104	0.09%	41	0.05%	1,403	0.85%	1,766	0.41%
Education & Cultural & Spiritual		217	0.33%	328	0.27%	60	0.08%	1,426	0.87%	2,031	0.48%
Health		48	0.07%	15	0.01%	27	0.03%	182	0.11%	272	0.06%
Office		70	0.11%	133	0.11%	22	0.03%	1,402	0.85%	1,627	0.38%
Commercial		178	0.27%	29	0.02%	33	0.04%	495	0.30%	735	0.17%
Mixed Use		318	0.49%	407	0.34%	158	0.20%	3,218	1.96%	4,101	0.96%
Hotel		15	0.02%	9	0.01%	0	0.00%	51	0.03%	75	0.02%
Sport		0	0.00%	8	0.01%	40	0.05%	97	0.06%	145	0.03%
Residential		62,991	96.59%	117,714	98.39%	77,306	99.28%	153,607	93.33%	411,618	96.33%
Industry		846	1.30%	897	0.75%	183	0.24%	1,731	1.05%	3,657	0.86%
Transport		121	0.19%	0	0.00%	0	0.00%	204	0.12%	325	0.08%
Military		190	0.29%	0	0.00%	0	0.00%	580	0.35%	770	0.18%
Park		0	0.00%	0	0.00%	0	0.00%	222	0.13%	222	0.05%
Total		65,212	100.00%	119,644	100.00%	77,870	100.00%	164,583	100.00%	427,309	100.00%

Source: JICA Study Team using the GIS land use map prepared by interpretation of the satellite imagery in 2016/2017.



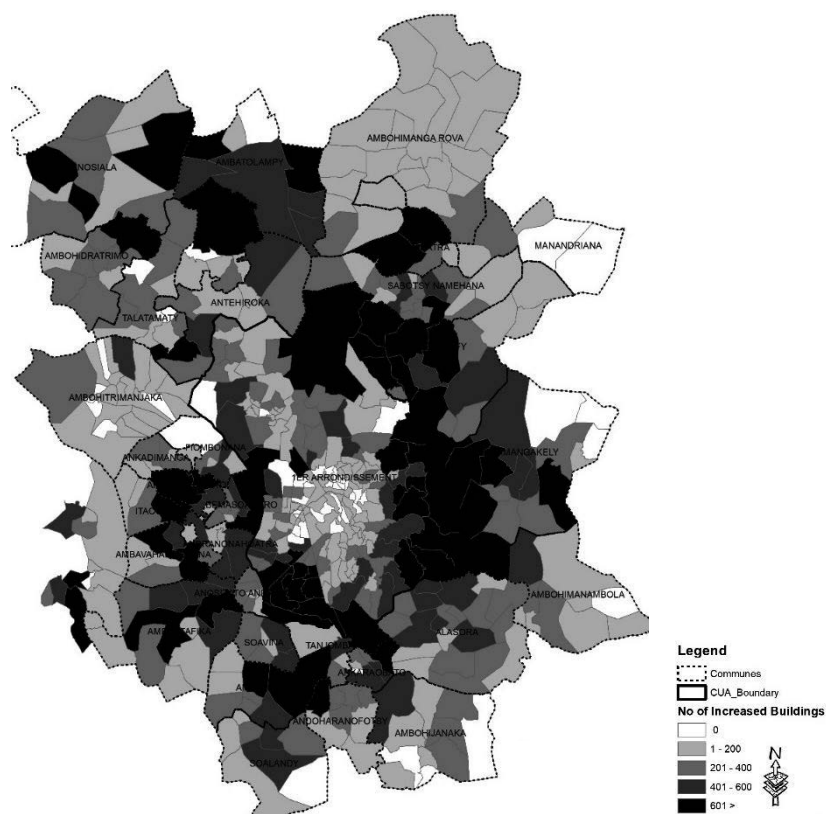
Source: JICA Study Team using the GIS land use map prepared by interpretation of the satellite imagery in 2016/2017.

**Figure 4.2.1 Distribution of Buildings by Use in Antananarivo Agglomeration**

## (2) Increase of Buildings in Antananarivo Agglomeration

In order to analyse the housing situation in Antananarivo Agglomeration, the growth of the buildings is examined by comparing the current total number of buildings with the data at the time of the preparation of PUDi 2004. As presented in Figure 4.2.2, the number of buildings increased in the fokontany of CUA along the boundaries with other communes. In particular, the fokontany experienced an increase in the number of buildings which are located in 2nd Arrondissement and Ambohimangakely in the east; in Ankadikely Ilafy and Sabotsy Namehana in the northeast; near Ivato Airport; in 4th Arrondissement and Tanjombato; and in the communes at the western bank of the Ikopa River, such as Bemasoandro, Andranonhoatra, and Ambohidrapeto.

Consequently, many new buildings were constructed at the edge of CUA and in the communes adjacent to it. However, the number of buildings in its centre did not increase. Although the map includes buildings of non-residential use, it is considered the map could show the growth of residential buildings, because residential buildings are of the majority in number. Thus, it is inferred that suburbanization has been occurring in Antananarivo Agglomeration since 2004.



Source: PUDi 2004 and JICA Study Team

**Figure 4.2.2 Increase in the Number of Buildings by Fokontany between 2004 and 2016 in Antananarivo Agglomeration**



Source: PUDi 2004 and JICA Study Team

**Figure 4.2.3 Comparison of Buildings between 2004 and 2016/2017 in Antananarivo Agglomeration**





**Table 4.2.2 Density of Residential Buildings at Fokontany Level in Antananarivo Agglomeration (2016)**

District	Commune	No. of Fokontany (No. of Residential Buildings per hector)											
		< 20	20-30	30-40	40-50	50<	Total	< 20	20-30	30-40	40-50	50<	Total
Ambohidratrimo	Ambatolampy	5	3				8	63%	38%	0%	0%	0%	100%
	Ambohidratrimo	4	4			1	9	44%	44%	0%	0%	11%	100%
	Ambohitrimanjaka	1	8	8	8		25	4%	32%	32%	32%	0%	100%
	Ampangabe	1	7	3	1		12	8%	58%	25%	8%	0%	100%
	Anosiala	7	9		1		17	41%	53%	0%	6%	0%	100%
	Antehiroka	2	3	3	1		9	22%	33%	33%	11%	0%	100%
	Ivato	3	2	1			6	50%	33%	17%	0%	0%	100%
	Talatamaty	4	7	1			12	33%	58%	8%	0%	0%	100%
	<b>Total</b>	<b>27</b>	<b>43</b>	<b>16</b>	<b>11</b>	<b>1</b>	<b>98</b>	<b>28%</b>	<b>44%</b>	<b>16%</b>	<b>11%</b>	<b>1%</b>	<b>100%</b>
Atsimondrano	Alakamisy Fenoarivo		1	2	2		5	0%	20%	40%	40%	0%	100%
	Ambavahaditokana		2	4			6	0%	33%	67%	0%	0%	100%
	Ambohidrapeto		3	2			5	0%	60%	40%	0%	0%	100%
	Ambohijanaka	9	3				12	75%	25%	0%	0%	0%	100%
	Ampanefy		3	2		3	8	0%	38%	25%	0%	38%	100%
	Ampitatafika	2	7	3	1		13	15%	54%	23%	8%	0%	100%
	Andoharanofotsy	2	4	2			8	25%	50%	25%	0%	0%	100%
	Andranonahoatra			4	2	1	7	0%	0%	57%	29%	14%	100%
	Ankadimanga		1	1	1	3	6	0%	17%	17%	17%	50%	100%
	Ankaraobato		1	3	2	1	7	0%	14%	43%	29%	14%	100%
	Anosizato Andrefana			2	1	4	7	0%	0%	29%	14%	57%	100%
	Bemasoandro			1	2	3	6	0%	0%	17%	33%	50%	100%
	Bongatsara	7					7	100%	0%	0%	0%	0%	100%
	Fenoarivo	1		4	6	1	12	8%	0%	33%	50%	8%	100%
	Fiombonana	1	1	1		2	5	20%	20%	20%	0%	40%	100%
	Itaosy	1		2	2	1	6	17%	0%	33%	33%	17%	100%
	Soalandy		4	1	2	1	8	0%	50%	13%	25%	13%	100%
	Soavina		1		3	1	5	0%	20%	0%	60%	20%	100%
	Tanjombato			1	1	3	5	0%	0%	20%	20%	60%	100%
	Tsiarahy	13		1	1		15	87%	0%	7%	7%	0%	100%
	Ambatomirahavavy (Arivonimamo District)	3	6	5		1	15	20%	40%	33%	0%	7%	100%
	<b>Total (Including Ambatomirahavavy)</b>	<b>39</b>	<b>37</b>	<b>41</b>	<b>26</b>	<b>25</b>	<b>168</b>	<b>23%</b>	<b>22%</b>	<b>24%</b>	<b>15%</b>	<b>15%</b>	<b>100%</b>
Avaradrano	Alasora	3	5	9	2	1	20	15%	25%	45%	10%	5%	100%
	Ambohimambola	3	5	2			10	30%	50%	20%	0%	0%	100%
	Ambohimanga Roa	7	11	3		1	22	32%	50%	14%	0%	5%	100%
	Ambohimangakely	9	7	1			17	53%	41%	6%	0%	0%	100%
	Ankadikely Ilafy	4	8	3	2		17	24%	47%	18%	12%	0%	100%
	Anosy Avaratra	3	2				5	60%	40%	0%	0%	0%	100%
	Manandriana	3	1			1	5	60%	20%	0%	0%	20%	100%
	Sabotsy Namehana	3	6	6	1	1	17	18%	35%	35%	6%	6%	100%
	<b>Total</b>	<b>35</b>	<b>45</b>	<b>24</b>	<b>5</b>	<b>4</b>	<b>113</b>	<b>31%</b>	<b>40%</b>	<b>21%</b>	<b>4%</b>	<b>4%</b>	<b>100%</b>
CUA	1 <sup>st</sup> Arrondissement	1	2	10	3	28	44	2%	5%	23%	7%	64%	100%
	2 <sup>nd</sup> Arrondissement		3	9	10	2	24	0%	13%	38%	42%	8%	100%
	3 <sup>rd</sup> Arrondissement	1	4	6	8	15	34	3%	12%	18%	24%	44%	100%
	4 <sup>th</sup> Arrondissement		3	6	7	16	32	0%	9%	19%	22%	50%	100%
	5 <sup>th</sup> Arrondissement	1	5	10	5	6	27	4%	19%	37%	19%	22%	100%
	6 <sup>th</sup> Arrondissement		1	6	3	21	31	0%	3%	19%	10%	68%	100%
	<b>Total</b>	<b>3</b>	<b>18</b>	<b>47</b>	<b>36</b>	<b>88</b>	<b>192</b>	<b>2%</b>	<b>9%</b>	<b>24%</b>	<b>19%</b>	<b>46%</b>	<b>100%</b>
<b>Grand Total</b>		<b>104</b>	<b>143</b>	<b>128</b>	<b>78</b>	<b>118</b>	<b>571</b>	<b>18%</b>	<b>25%</b>	<b>22%</b>	<b>14%</b>	<b>21%</b>	<b>100%</b>

Source: JICA Study Team using the GIS land use map prepared by interpretation of the satellite imagery in 2016/2017.

#### (4) Average Footprint Size of Residential Buildings in Antananarivo Agglomeration

The average footprint size of residential buildings in Antananarivo Agglomeration is estimated as shown in Table 4.2.3 and Figure 4.2.5<sup>1</sup>. The average footprint size in the four districts is between

<sup>1</sup> The average footprint size of residential buildings is estimated by dividing the total footprint size of residential buildings by the number of the buildings. The mixed use buildings are excluded from the estimation in order to investigate the condition of the buildings exclusively used for residential purposes.

61.9 and 65.0 m<sup>2</sup>, except for Antananarivo Atsimondrano District (including Ambatomirahavavy Commune in Arivonimamo District) which is much smaller being only 56.6 m<sup>2</sup>.

Although many of the communes in Atsimondrano District have small average footprint size, the land is still spacious in most of the communes located in the outskirt of Antananarivo Agglomeration. Therefore, the average building footprint size may be small in communes such as Ambohitrimanjaka, Ampangabe, Soalandy, Tsiafahy and Ambatomirahavavy according to Table 4.2.3, but the density level of residential buildings is not so high according to Table 4.2.2, and each lot size is usually quite large.

However, communes such as Ampanefy, Ankadimanga, Anosizato Andrefana, Soavina and Tanjombato (which are relatively located closer to CUA) have small average footprint size and high-density level of residential buildings.

CUA's average footprint size is 62 m<sup>2</sup>; and the smallest and largest sizes are 48 m<sup>2</sup> in 6th Arrondissement and 72 m<sup>2</sup> in 5th Arrondissement, respectively. Three fokontany in 6th Arrondissement have average size of less than 30 m<sup>2</sup>, while five fokontany have average size between 30 m<sup>2</sup> to 35 m<sup>2</sup>. On the other hand, the large footprint size of over 100 m<sup>2</sup> is found in the fokontany of urban centre in 3rd and 1st Arrondissements, and in fokontany in 4th and 5th Arrondissements. Similar situation is assumed to be existing in the above five communes with small average footprint size.

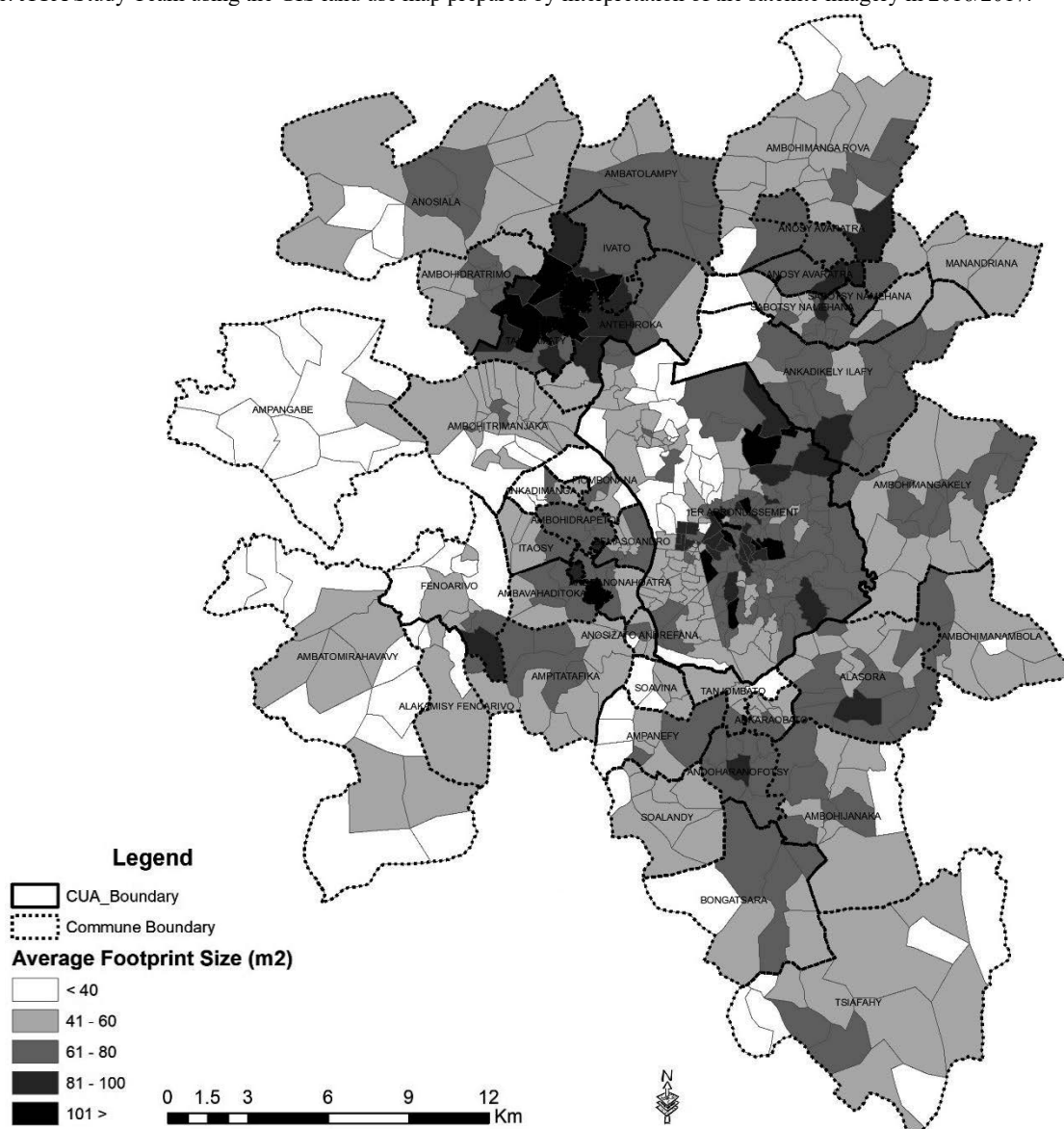
**Table 4.2.3 Number of Fokontany by the Level of Average Footprint Size of Residential Buildings in Antananarivo Agglomeration (2016)**

District	Arrondissement / Commune	Average Size (m <sup>2</sup> )	No. of Fokontany						Share (%) of Fokontany					
			Average Size (m <sup>2</sup> ) of Residential Buildings						Average Size (m <sup>2</sup> ) of Residential Buildings					
			< 40	40-60	60-80	80-100	100 <	Total	< 40	40-60	60-80	80-100	100 <	Total
Ambohidratrimo	Ambatolampy	60.1	0	3	5	0	0	8	0.0%	37.5%	62.5%	0.0%	0.0%	100.0%
	Ambohidratrimo	63.4	0	4	5	0	0	9	0.0%	44.4%	55.6%	0.0%	0.0%	100.0%
	Ambohitrimanjaka	49.3	4	18	3	0	0	25	16.0%	72.0%	12.0%	0.0%	0.0%	100.0%
	Ampangabe	36.3	10	2	0	0	0	12	83.3%	16.7%	0.0%	0.0%	0.0%	100.0%
	Anosiala	55.6	3	10	4	0	0	17	17.6%	58.8%	23.5%	0.0%	0.0%	100.0%
	Antehiroka	74.2	0	3	3	2	1	9	0.0%	33.3%	33.3%	22.2%	11.1%	100.0%
	Ivato	80.0	0	0	2	2	2	6	0.0%	0.0%	33.3%	33.3%	33.3%	100.0%
	Talatamaty	87.2	0	0	3	6	3	12	0.0%	0.0%	25.0%	50.0%	25.0%	100.0%
	<b>Total</b>	<b>65.0</b>	<b>17</b>	<b>40</b>	<b>25</b>	<b>10</b>	<b>6</b>	<b>98</b>	<b>17.3%</b>	<b>40.8%</b>	<b>25.5%</b>	<b>10.2%</b>	<b>6.1%</b>	<b>100.0%</b>
Antananarivo Atsimondrano	Alakamisy Fenoarivo	44.6	3	2	0	0	0	5	60.0%	40.0%	0.0%	0.0%	0.0%	100.0%
	Ambavahaditokana	65.2	0	2	4	0	0	6	0.0%	33.3%	66.7%	0.0%	0.0%	100.0%
	Ambohidrapeto	63.1	0	1	4	0	0	5	0.0%	20.0%	80.0%	0.0%	0.0%	100.0%
	Ambohijanaka	62.0	1	6	5	0	0	12	8.3%	50.0%	41.7%	0.0%	0.0%	100.0%
	Ampanefy	49.5	3	3	2	0	0	8	37.5%	37.5%	25.0%	0.0%	0.0%	100.0%
	Ampitatafika	59.4	0	8	5	0	0	13	0.0%	61.5%	38.5%	0.0%	0.0%	100.0%
	Andoharanofotsy	73.0	0	0	7	1	0	8	0.0%	0.0%	87.5%	12.5%	0.0%	100.0%
	Andranonahoatra	68.9	0	2	4	1	0	7	0.0%	28.6%	57.1%	14.3%	0.0%	100.0%
	Ankadimanga	46.4	3	2	1	0	0	6	50.0%	33.3%	16.7%	0.0%	0.0%	100.0%
	Ankaraobato	55.2	0	6	1	0	0	7	0.0%	85.7%	14.3%	0.0%	0.0%	100.0%
	Anosizato Andrefana	47.8	1	4	2	0	0	7	14.3%	57.1%	28.6%	0.0%	0.0%	100.0%
	Bemasoandro	58.7	0	3	3	0	0	6	0.0%	50.0%	50.0%	0.0%	0.0%	100.0%
	Bongatsara	63.0	1	3	3	0	0	7	14.3%	42.9%	42.9%	0.0%	0.0%	100.0%
	Fenoarivo	44.4	5	4	2	1	0	12	41.7%	33.3%	16.7%	8.3%	0.0%	100.0%
	Fiombonana	54.5	2	2	1	0	0	5	40.0%	40.0%	20.0%	0.0%	0.0%	100.0%
	Itaosy	69.9	0	3	1	1	1	6	0.0%	50.0%	16.7%	16.7%	16.7%	100.0%
	Soalandy	47.2	1	7	0	0	0	8	12.5%	87.5%	0.0%	0.0%	0.0%	100.0%
	Soavina	49.5	2	3	0	0	0	5	40.0%	60.0%	0.0%	0.0%	0.0%	100.0%
	Tanjombato	48.1	1	3	1	0	0	5	20.0%	60.0%	20.0%	0.0%	0.0%	100.0%
	Tsiafahy	48.9	6	7	2	0	0	15	40.0%	46.7%	13.3%	0.0%	0.0%	100.0%
	Ambatomirahavavy (Arivonimamo District)	40.9	9	6	0	0	0	15	60.0%	40.0%	0.0%	0.0%	0.0%	100.0%
	<b>Total (Including Ambatomirahavavy)</b>	<b>56.6</b>	<b>38</b>	<b>77</b>	<b>48</b>	<b>4</b>	<b>1</b>	<b>168</b>	<b>22.6%</b>	<b>45.8%</b>	<b>28.6%</b>	<b>2.4%</b>	<b>0.6%</b>	<b>100.0%</b>

**The Project on Master Plan Formulation for Economic Axis of TaToM (Antananarivo-Toamasina, Madagascar)**  
**Final Report: Present Situation and Challenges on Urban Development and Housing Development in Antananarivo Agglomeration**

Antananarivo Avaradrano	Alasora	59.1	0	10	9	1	0	20	0.0%	50.0%	45.0%	5.0%	0.0%	100.0%
	Ambohimambola	57.5	1	6	3	0	0	10	10.0%	60.0%	30.0%	0.0%	0.0%	100.0%
	Ambohimanga Rova	56.3	3	14	4	1	0	22	13.6%	63.6%	18.2%	4.5%	0.0%	100.0%
	Ambohimangakely	59.4	0	9	8	0	0	17	0.0%	52.9%	47.1%	0.0%	0.0%	100.0%
	Ankadikely Ilafy	67.6	1	3	12	1	0	17	5.9%	17.6%	70.6%	5.9%	0.0%	100.0%
	Anosy Avaratra	75.1	0	0	3	2	0	5	0.0%	0.0%	60.0%	40.0%	0.0%	100.0%
	Manandriana	54.4	0	4	1	0	0	5	0.0%	80.0%	20.0%	0.0%	0.0%	100.0%
	Sabotsy Namehana	63.8	1	6	9	1	0	17	5.9%	35.3%	52.9%	5.9%	0.0%	100.0%
<b>Total</b>		<b>62.3</b>	<b>6</b>	<b>52</b>	<b>49</b>	<b>6</b>	<b>0</b>	<b>113</b>	<b>5.3%</b>	<b>46.0%</b>	<b>43.4%</b>	<b>5.3%</b>	<b>0.0%</b>	<b>100.0%</b>
Antananarivo Renivohitra (CUA)	1 <sup>st</sup> Arrondissement	61.0	4	16	8	14	2	44	9.1%	36.4%	18.2%	31.8%	4.5%	100.0%
	2 <sup>nd</sup> Arrondissement	65.8	0	7	16	1	0	24	0.0%	29.2%	66.7%	4.2%	0.0%	100.0%
	3 <sup>rd</sup> Arrondissement	67.3	4	3	17	5	5	34	11.8%	8.8%	50.0%	14.7%	14.7%	100.0%
	4 <sup>th</sup> Arrondissement	51.3	1	19	10	1	1	32	3.1%	59.4%	31.3%	3.1%	3.1%	100.0%
	5 <sup>th</sup> Arrondissement	71.9	1	5	15	4	2	27	3.7%	18.5%	55.6%	14.8%	7.4%	100.0%
	6 <sup>th</sup> Arrondissement	47.7	11	16	4	0	0	31	35.5%	51.6%	12.9%	0.0%	0.0%	100.0%
<b>Total</b>		<b>61.9</b>	<b>21</b>	<b>66</b>	<b>70</b>	<b>25</b>	<b>10</b>	<b>192</b>	<b>10.9%</b>	<b>34.4%</b>	<b>36.5%</b>	<b>13.0%</b>	<b>5.2%</b>	<b>100.0%</b>

Source: JICA Study Team using the GIS land use map prepared by interpretation of the satellite imagery in 2016/2017.



Source: JICA Study Team using the GIS land use map prepared by interpretation of the satellite imagery in 2016/2017.

**Figure 4.2.5 Average Footprint Size of Residential Buildings in Antananarivo Agglomeration (2016)**

## 4.2.2 Characteristics and Problems on Housing and Informal Settlements in Antananarivo Agglomeration

This section discusses characteristics and problems on housing in Antananarivo Agglomeration.

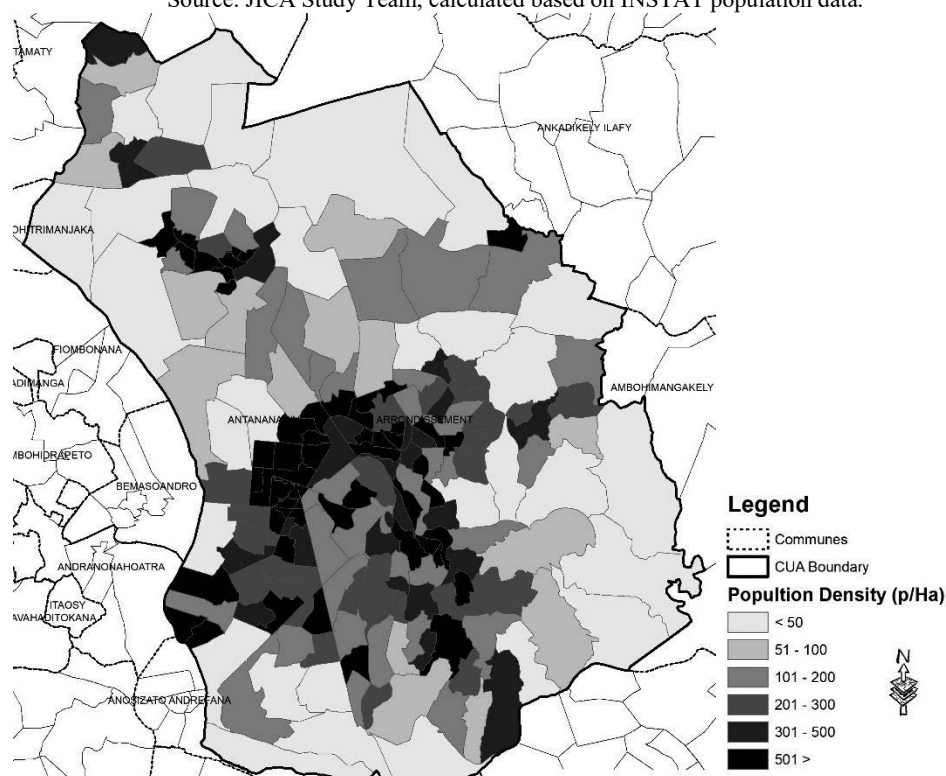
### (1) Highly Congested Urban Centre without Basic Infrastructure and Services and With High Disaster Risk

In CUA, some fokontany are highly congested. There are 48 fokontany with population density of more than 500 persons/ ha. Among these fokontany, 47 are located in CUA and 38% of them, or 18 fokontany, are in 1<sup>st</sup> Arrondissement, followed by 3<sup>rd</sup> Arrondissement with 21% or 10 fokontany as shown in Table. Basic infrastructure and social services such as roads, water supply, drainage and sanitation, and health and educational facilities are insufficient in these areas. Consequently, lack of sanitary facilities causes health issues, and dumping of waste in canals and drainage reduces the capacity of water to flow and worsens the impact of flooding. Some of these fokontany in 1<sup>st</sup> and 4<sup>th</sup> Arrondissement are prone to inundation during heavy rains and hurricanes. Because of the congestion, fire risk is high and narrow streets could prevent fire trucks and ambulance from getting into the settlements at the time of disaster and emergency. Figure 4.2.7 shows the location of fokontany without sufficient roads. Furthermore, emergence of informal settlements is alarming caused by ambiguous cadastral information and lack of land title.

**Table 4.2.4 Number of Fokontany with Population Density of More than 500 persons/ ha in CUA**

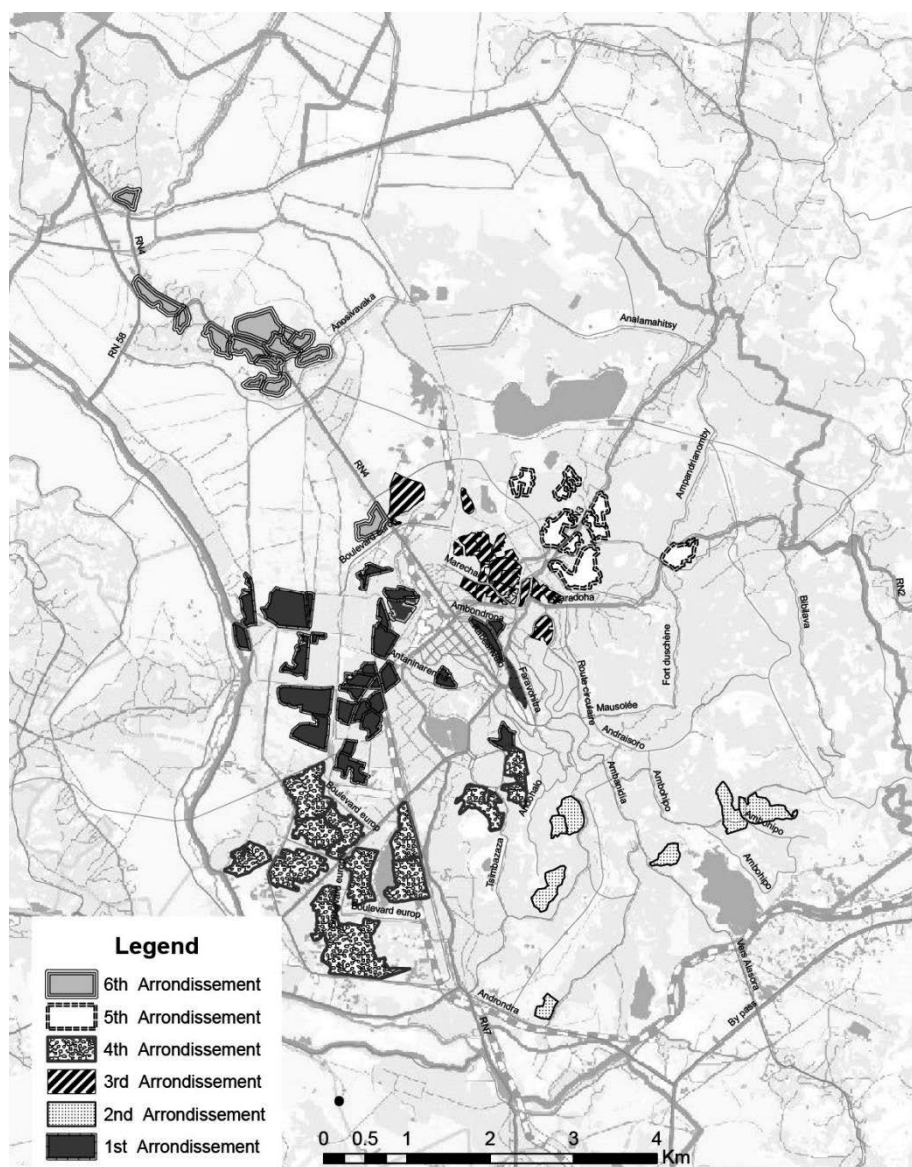
Arrondissement	No. of Fokontany	%
1er Arrondissement	18	38%
2e Arrondissement	3	6%
3e Arrondissement	10	21%
4e Arrondissement	4	9%
5e Arrondissement	5	11%
6e Arrondissement	7	15%
Total	47	100%

Source: JICA Study Team, calculated based on INSTAT population data.



Source: JICA Study Team based on population data from INSTAT

**Figure 4.2.6 Population Density by Fokontany (Persons / ha) in CUA (2018)**



Source: JICA Study Team

**Figure 4.2.7 Residential Areas without Sufficient Roads in CUA**

## **(2) Development of Urban Areas in Suburban Areas Lacking Basic Infrastructure**

Although the population density is not very high compared with the fokontany in CUA, urbanisation is progressing in the fokontany of suburban communes, especially along the national roads and around suburban centres. Nevertheless, the settlements in these fokontany have often been developed without basic infrastructure, such as roads, and access to water supply. Regarding the issue of mobility, lack of sufficient roads is not the only problem within the neighbourhoods, but also the issue of access to the urban centre of CUA due to the limited capacity of arterial roads. Thus, it is necessary to develop the infrastructure not only at the community level but also at the commune level.

## **(3) Insufficient Housing Provision for Middle- and Low-Income Classes**

Due to the lack of housing policy as well as instability caused by political and economic crises, investments in urban and housing development have been neglected. Moreover, bureaucratic procedures for development permits and ambiguous land tenure discourage development of land market and good quality housing stocks. As a result, there is a huge gap between the supply and demand of affordable housing for the middle- and low-income families. Subdivision-type of residential development, which is common in suburban areas of major cities in developing

countries, is rarely seen in Antananarivo Agglomeration. The development of transparent land and housing markets as well as vibrant real estate industry can contribute to economic growth of the urban areas. Therefore, incentives and financing scheme to increase housing provision by the private sector, especially for the middle- and low-income households should be developed and promoted as part of the National Housing Policy. The efforts should also help solve land tenure issue and to streamline the procedure for construction permit approval to speed up transactions for land and housing.

#### **(4) Unqualified Houses Obtaining Construction Permit**

PUDi 2004 defined the requirement for the minimum lot size for each land use zone. The smallest minimum lot size defined in PUDi 2004 is 175 m<sup>2</sup> with building coverage ratio of 50%. Assuming the building coverage ratio of 50%, the average lot size of land for CUA is estimated in the range of 95 m<sup>2</sup> to 144 m<sup>2</sup>. However, the true building coverage ratio is considered to be lower than that; therefore, the lot size is also smaller than the estimate. Thus, it can be said that the current minimum lot size in PUDi 2004 is too large and unrealistic, based on the examination of the actual situation.

Furthermore, the Urban and Housing Law 2015 (LUH 2015) of Madagascar defines the requirement for the minimum lot size for any construction as 150m<sup>2</sup>. Therefore, most of the existing residential buildings in areas with small building footprint size do not qualify to this standard.

As a result, many buildings existing in Antananarivo Agglomeration did not have construction permits.

### **4.3 Present Situation on Open Space in Antananarivo Agglomeration**

#### **4.3.1 Situation on Open Space in Antananarivo Agglomeration**

As described in the previous two sections, urbanized areas have been expanding gradually towards outside CUA in the past decades (See Figure 4.1.1). As the urbanisation pressure emerges, unoccupied lands are slowly vanishing in the central areas of Antananarivo Agglomeration, although there are still plenty of lands left in some communes.

In addition to the concern for availability of land, the number of existing facilities in Antananarivo Agglomeration currently recognised as open space is limited. Since parks or open spaces in the city are not enough, one example occurring in CUA, is that the green areas inside roundabouts are often used by the residents as places to rest and enjoy with families and friends. Meanwhile outside CUA, there are only four facilities recognised as open space (See Figure 4.3.1).

In the future, the population of Antananarivo Agglomeration will be increasing less in CUA and more outside CUA. Therefore, it is urgently needed to preserve lands where the future population can relax and enjoy the environment.

In addition, with the risk of river flooding and inundation, especially in CUA, it is important for open spaces to have water-retaining function. Until now, the paddy fields and wetlands have been playing such role. However, such lands are also being converted gradually to urbanised areas.

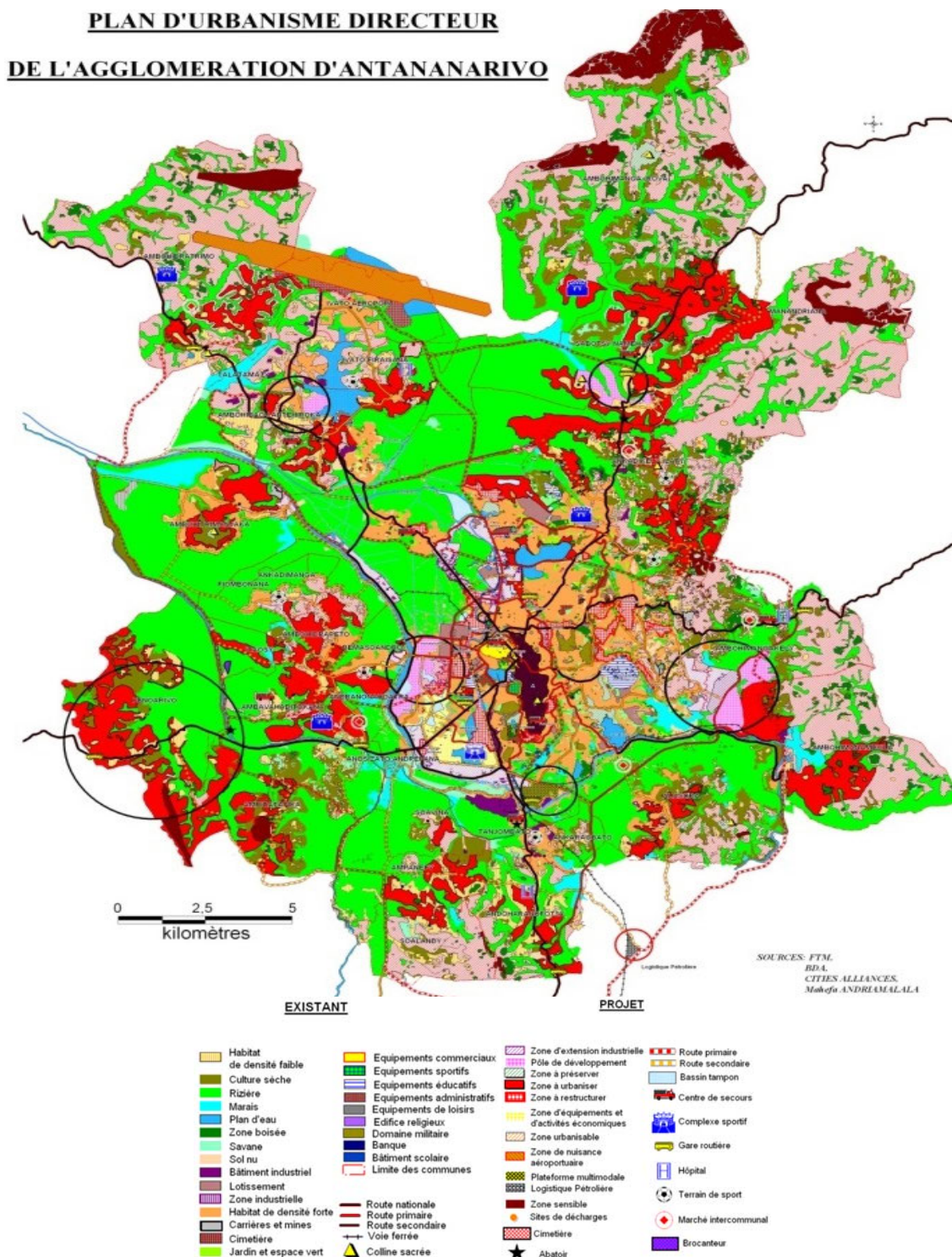




## 4.4 Review of Existing Urban Development Plans and Ideas for Antananarivo Agglomeration

### 4.4.1 Urban Structure proposed in the Existing PUDi for Antananarivo Agglomeration

While there was no clear figure to show proposed urban structure in PUDi 2004 for Antananarivo Agglomeration, the zoning plan of Figure 4.4.1 shows the future urbanization pattern. Table 4.4.1 describes some zones identified in this figure.



Source: PUDi 2004 for Antananarivo Agglomeration

Figure 4.4.1 Zoning Plan of PUDi 2004 for Antananarivo Agglomeration



**Table 4.4.1 Land Use Pattern of Antananarivo Agglomeration Proposed in PUDi 2004**

Zones for urban expansion	Zone to Urbanize	Some small areas in CUA such as around Lac Masay near Ankorondrano were designated as this zone, but the majority were designated in the surrounding areas of CUA. This reflects that there are less lands for new residential areas remain in CUA. <b>[West]</b> 1) Itaosy area including Ambohidrapeto, Bemasoandro, Andranonahoatra, and Ambavahaditokana, 2) South of Ampitatafika, and 3) around Fenoarivo were designated. The areas are accessible from NR1. <b>[East]</b> No lands were designated near NR2. Ambohimambola areas are designated and it is accessible from Tokyo Boulevard. <b>[South]</b> Some lands in Andoharanofotsy, Ampanefy, and Soavina were designated, and they are accessible from NR7. <b>[North East]</b> Northern edge of CUA with reclamation, around Ankadikely Ifaty, areas between NR2 and NR3, around Sabotsy Namehana, and Manandriana were designated, and they are accessible from NR3. <b>[North West]</b> Some area in Amohibao and Antehirooka, Ivato Firaiana and Ambohidratrimo were designated and they are accessible from NR4. Ambohitrimanjaka was also designated, but it requires for better access roads.
	Urbanisable Area	Majority of urbanisable areas were identified outside of the "Zone to Urbanize." However, the area designated for the western part of the agglomeration is limited due to constraint on landscape.
	Industrial Expansion Zone	Industrial areas for expansion are identified on the edges of CUA, for instance areas around Ankorondrano, right bank of Ikopa River in the north-west part of CUA, south part of CUA and along Tokyo Boulevard. No areas in the suburb was designated for new industrial area.
Zones to restructure existing urbanized areas	Development Pole Area	This area are mainly identified in the following four locations. <b>[Ambohimangakely]</b> Ambohimangakely Development Pole is intended for development of light industries and processing industries. However, the industrial zone should exclude any polluting industries because it is located at the upstream of the Ikopa River This area will also accommodate housing areas. <b>[Sabotsy Namehana - Antsofinondry]</b> This development pole is a zone for large community facilities such as sports complex, social and administrative facilities. <b>[Antanetibe – Talatamaty]</b> This development pole is close to the airport and is for hotels and administrative facilities.. <b>[Anosipatrana Digue]</b> This area was originally green space and was not permitted to be urbanised. However, this area was designated as a development pole to locate urban activities such as administration and commercial activities.
	Restructure Area	These areas were identified within the existing urbanised areas, mainly inside CUA, such as some parts of Tsubbazaza, Mandrangobato, some part of 67 Ha, Antohomadinika, Ankazomanga, Besarety, Ambohidahy and Ambatomaro.
	Area for Facilities and Economic Activities	South western part of CUA, between NR1 and NR7 was identified. It is intended to expand the areas for economic activities by upgrading/installing urban facilities.

Source: JICA Study Team based on PUDi 2004 Antananarivo Agglomeration

In PUDi 2004, other prospective actions are also described for 1) the Multimodal Platform of Ankadievo, 2) Downtown Redevelopment for Analakely, 3) Southern Plain Activity Zone and 4) Development Pole of Fenoarivo as a techno pole.

Although PUDi 2004 for Antananarivo Agglomeration proposed several ring roads and radial roads, it did not proposed any large-scale restructuring of the future agglomeration to growing populations and economic activities.

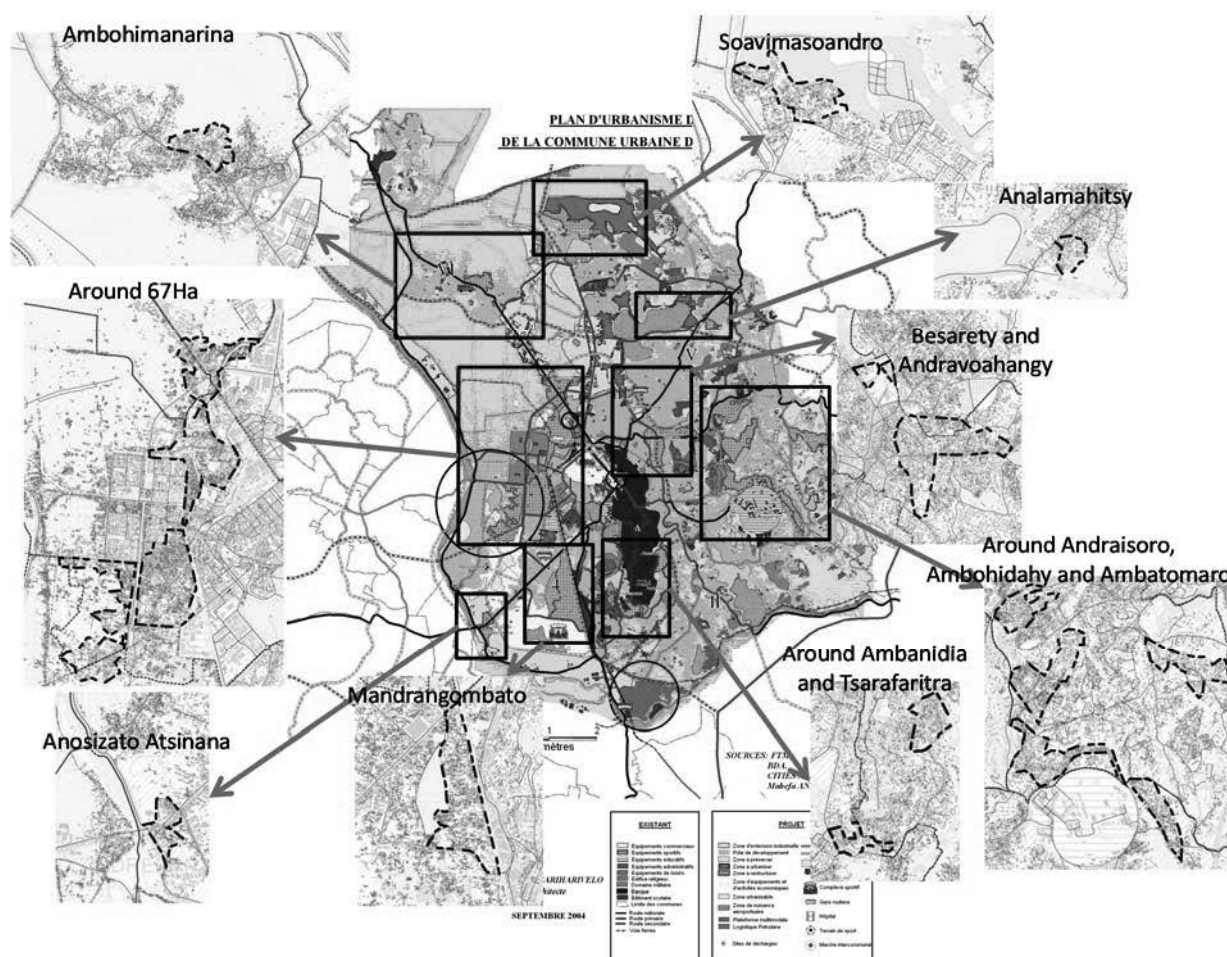
Regarding the residential areas, comparing the land use zoning plan of PUDi 2004 for Antananarivo Agglomeration with the present land use, the following features were observed by zoning categories:

### 1) Area to Restructure

This zoning category is designated to areas which should reduce the housing density. At present, some areas such as Ambanidia, Tsarafaritra, Besarety and Andravoahangy have relatively larger buildings with less density while the other areas such as the following still remain congested with small buildings in a relatively small parcel of land:

- Ambohimanarina

- The area around 67 Ha (Antetezana Afovoany, Andavamamba Anjezika, Anatihazo, Andranomanalina and Ankazomanga Atsimo)
- Anosizato Atsinanana
- Mandrangombato
- The area around Andraisoro, Ambohidahy and Ambatomaro
- Analamahitsy
- Soavimasandro



Note: Buildings in red have footprint size less than 50m<sup>2</sup>.

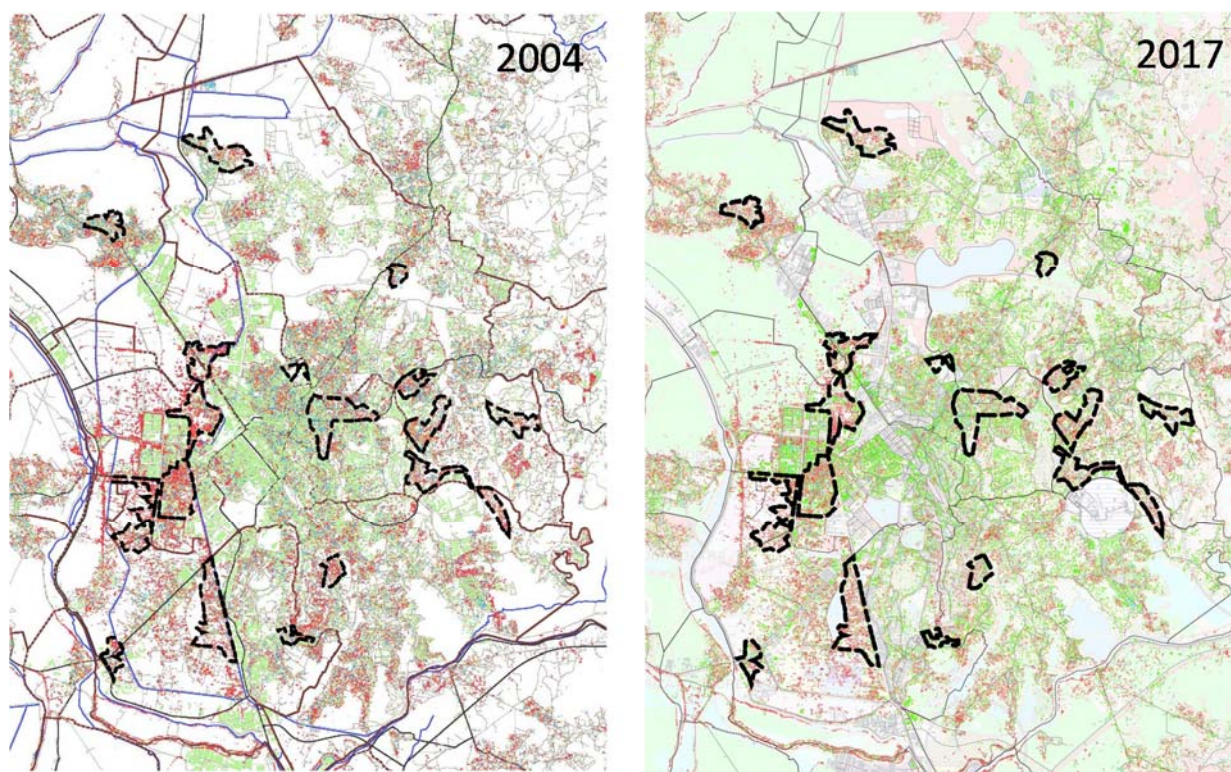
Source: JICA Study Team using PUDi 2004 and building footprint data of 2016/17

**Figure 4.4.2 Present Situation of Building Density in Zoning Category "Area to Restructure" in PUDi 2004 for Antananarivo Agglomeration**

In areas such as Mandrangombato, the number of buildings have increased

Around Andraisoro, Ambohidahy and Ambatomaro, and in Ambohimananina, the size of the buildings has become smaller.

Despite designating restructure zones in PUDi 2004, improvement in the area was limited and many of these areas continue to be areas with high building density.



Note: Buildings in red have footprint size less than 50m<sup>2</sup>.  
 Source: JICA Study Team

Figure 4.4.3 Changes in Size of Buildings in Restructure Zones of PUDi 2004

## 2) Zone to Urbanized and Urbanisable Area

- **Southeast-East**: Ankadilely Ilafy and Ambohimambola have more than doubled the number of buildings between 2004 and 2017. However, areas designated as Zones to be Urbanised in Ankadilely Ilafy and Ambohimambola have not been urbanised as planned. This may be due to the delay in implementation of planned roads.
- **North-West**: Urbanisation has occurred in the areas designated as urbanisable land and in land to be urbanized.
- **South**: Around Soalandy, some non-urbanisable, agricultural land have urbanised.
- **West**: Urbanisation has rapidly occurred in Itaosy area. On the other hand, area further west designated as Zone to be Urbanized in north of Fenoarivo and south of Ampitatafika have not urbanised as planned.
- In 2006 PUDi, urbanisable land was large enough to provide the future households in 2015 with land of 150m<sup>2</sup>/household. However, most urbanisation has occurred in the areas designated as urbanisable land in the communes outside CUA. At the same time, areas in CUA and communes neighbouring CUA have also densified in within the existing urbanized area changing the land use from dry cultivation land to residential area. This is assumed to be caused because of lack of infrastructure in the urbanisable areas.

## 4.4.2 M2PATE Vision for Antananarivo Agglomeration

In 2017, M2PATE revealed a project and policy map for Antananarivo Agglomeration which is commonly called M2PATE Vision, as shown in Figure 4.4.4. Several project and target areas for future development are identified on this map. This vision is a series of projects with major ideas for future development by M2PATE. Table 4.4.2 summarises the ideas shown in the map.

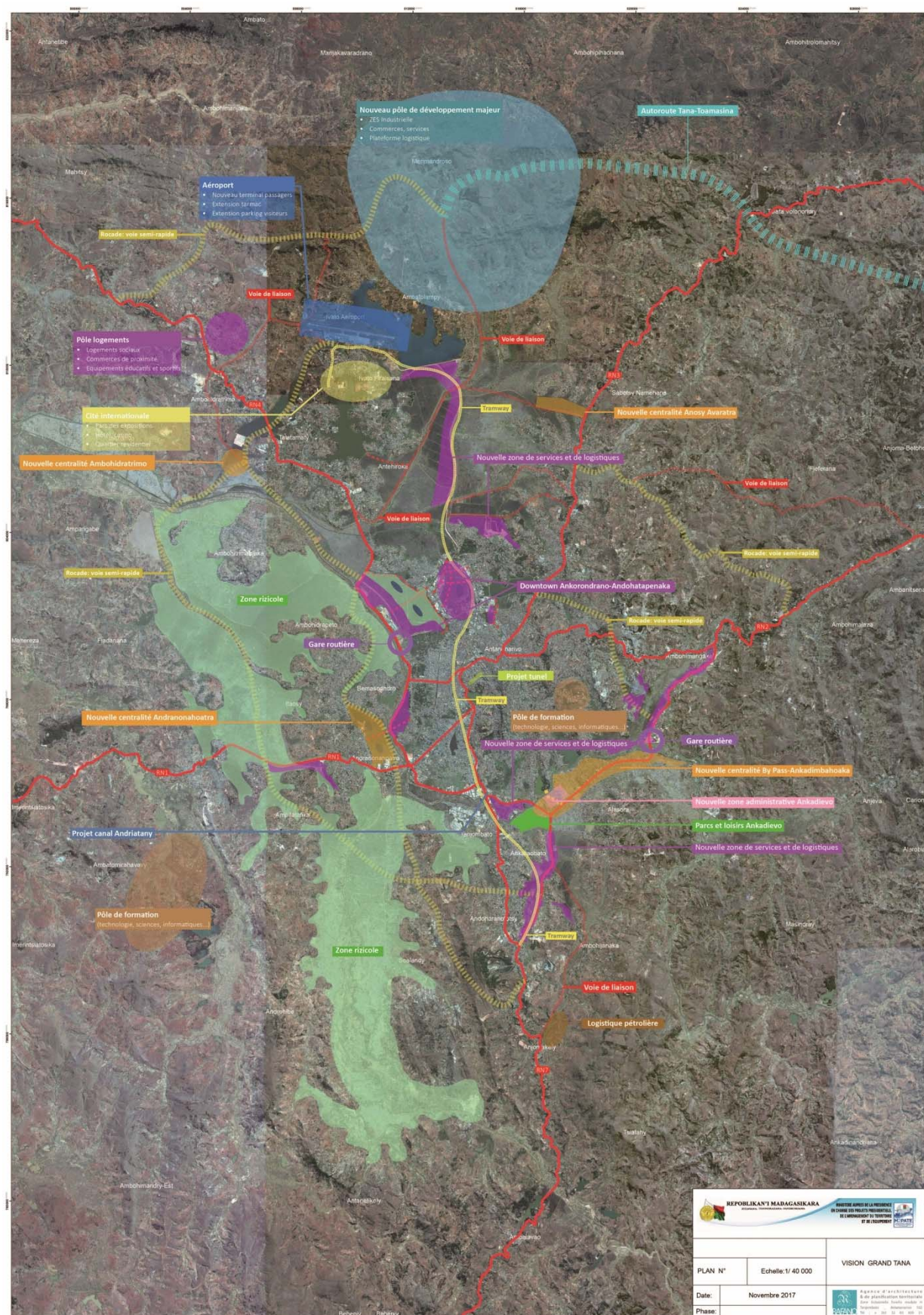
**Table 4.4.2 Major Development Ideas in M2PATE Vision**

New Development Area	<p><b>[Down Town Ankorondrano – Andohatapenaka]:</b> Ankorondrano area is already becoming a new city centre. There is a new road constructed in Andohatapenaka with several urban functions. M2PATE is also aiming to change this area into a future urban centre.</p> <p><b>[New Service and Logistics Zone]:</b> Two areas are designated for this purpose, namely areas along Tsarasaotra Road and areas around Tokyo Boulevard. By utilising these roads, these areas are aiming to become new service and logistics areas.</p> <p><b>[Development Zone in Ampitatafika]:</b> Wetland around Ampitatafika, along NR1, to become a new development area by landfilling.</p> <p><b>[Logistic Pole in Anosiara]:</b> As the area already has an industrial functions, and it is aiming to be a centre with social housings, a local commercial centre, and education and sports facilities.</p>
New Urban Centre (New Administrative Zone)	<p>Four sites are identified to create new urban centres. They are proposed in the neighbouring communes of CUA.</p> <p><b>[Ambohidratrimo]</b> is located along NR4, in the north-west part of the agglomeration. Originally, a new land was to be created by land filling the wetland. However, due to importance of the wetland for inundation, the location can be alternated around this area.</p> <p><b>[Anosy Avaratra]</b> is located along NR3, in the north-east part of the agglomeration. This site is also proposed on the wetland by land filling.</p> <p><b>[Bypass Ankadimbahoaka]</b> and <b>[New Administrative Zone Ankadievo]:</b> Areas along Tokyo Boulevard is also proposed as a new urban centre. It includes Ankadievo area for a new administrative centre which plans to have administrative functions such as government offices.</p> <p><b>[Andranonahoatra]:</b> It is located on the left bank of Ikopa River, close to Anosizato. A new urban centre by filling wetland is proposed.</p>
New Major Development	<p>In the north of Ivato Airport, a large area is identified for future development including economic special zone. A new service and commercial centre, and logistics functions are also planned.</p>
Educational Centre	<p>Two sites are identified as educational centres, which promotes technology, science, information, etc. Both sites already have universities, which are Antananarivo University and Ecole Supérieure Polytechnique d'Antananarivo (ESPA) Vontovorona.</p>
International City (Airport City)	<p>Around Ivato Airport, a new development is proposed for International City including an exhibition park, hotels and casinos, and residential development.</p>
Road Projects	<p>Several arterial roads are proposed. Major projects are; bypass roads in the west part of the agglomeration passing through the wetland along Sisaony River, ring roads connecting NR2 and NR3, and some new roads composing a road network in the north part of the agglomeration.</p>
Conservation Area	<p>A large wetland is proposed to be conserved along Sisaony River for rice production and preventing inundation.</p>
Other Projects	<p>Several other projects are proposed as follows.</p> <ul style="list-style-type: none"> <li>• A tunnel is proposed in the centre of CUA to connect Anosy and Analakely.</li> <li>• A tramway is proposed from the development area around Airport (north) to Iavoloha where the junction of NR7 and Tokyo Boulevard is located. The tramway is passing through the centre of CUA.</li> <li>• Oil tank is proposed to be relocated from Ankorondrano to Anjomakely</li> </ul>

Source: JICA Study Team based on Hearings from M2PATE



4-29



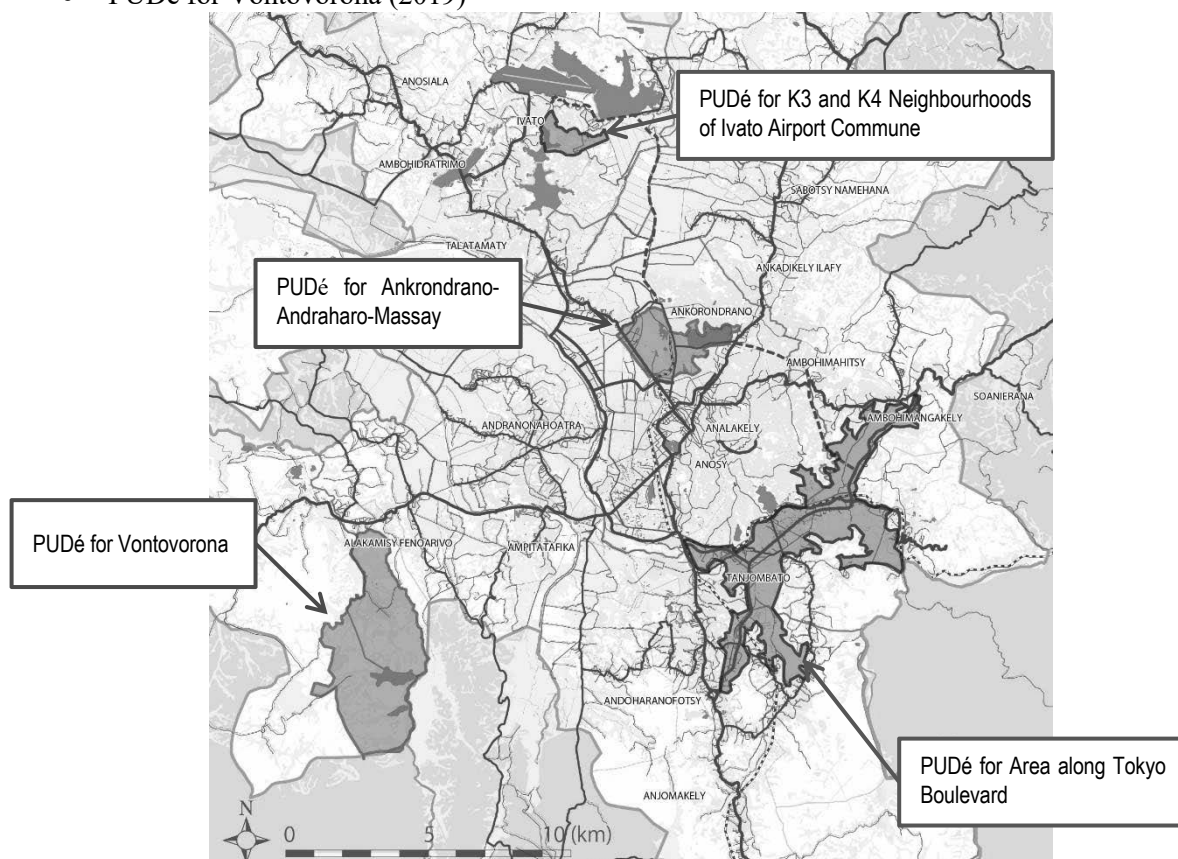
### 4.4.3 PUDés in Antananarivo Agglomeration

“Plans d’Urbanisme de Détail (PUDé)” is a detailed urban plan, which can be understood as a tool to realize the PUDi.

PUDé complements to PUDi for Antananarivo Agglomeration, and should serve as a framework for guiding projects at the local level. PUDé provides realistic answers to the local needs and proposes better spatial planning and integration of different infrastructures to be rehabilitated (roads, sewerage networks, structuring networks, socio-economic and environmental facilities).

In order to create Antananarivo as the national capital, to improve urban mobility, and to realize better management of the agglomeration, MAHTP has formulated the following PUDés:

- PUDé for K3 and K4 Neighbourhoods of Ivato Airport Commune (Plan d’Urbanisme de Détail des Quartiers K3 et K4 de la Commune d’Ivato Aeroport) (2007)
- PUDé for Area along Tokyo Boulevard (Plan d’Urbanisme de Détail des territoires du Bypass et de la Bretelle) (2016)
- PUDé for Ankrondrano- Andraharo-Massay (Ongoing)
- PUDé for Vontovorona (2019)



Source: JICA Study Team

Figure 4.4.5 Locations of PUDés in Antananarivo Agglomeration

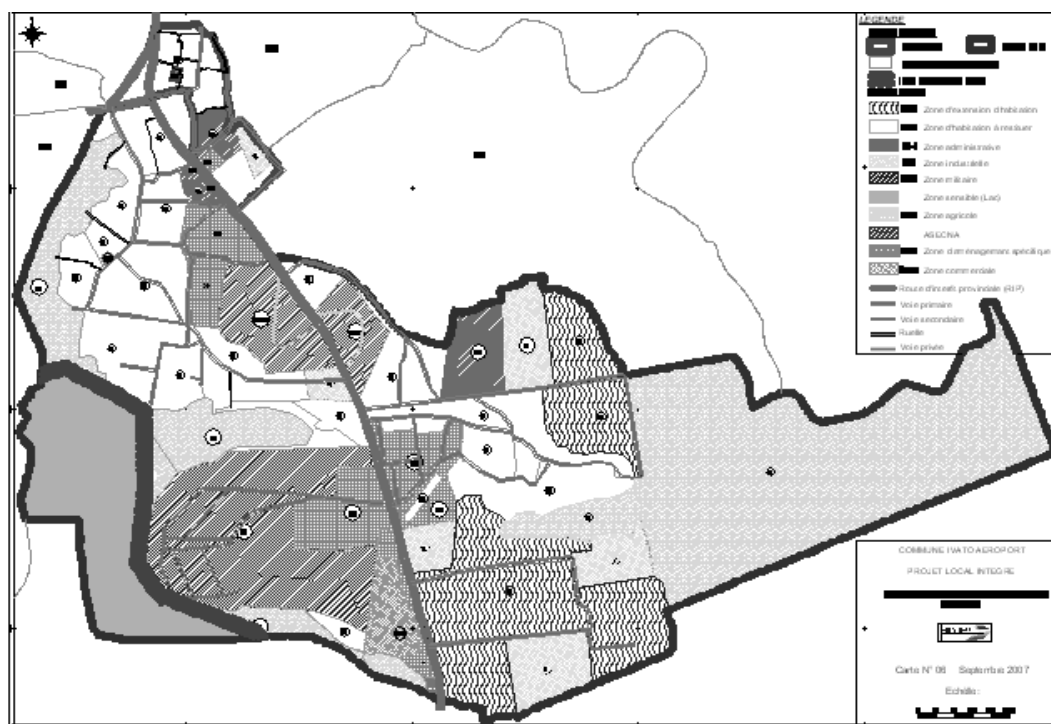
#### (1) PUDé for K3 and K4 Neighbourhoods of Ivato Airport Commune (Plan d’Urbanisme Detaille des Quartiers K3 et K4 de la Commune d’Ivato Aeroport)

The main objective of this PUDé is to restructure K3 and K4 Neighbourhoods in Commune of Ivato Airport, in order to improve the living environment. The specific objectives are as follows:

- To increase revenues to the commune
- To improve urban governance and strengthen management abilities of the commune.
- To restructure informal settlement
- To secure land tenure in urban and peri-urban areas



PUDé proposed the following aspects: 1) particular patterns of land use, 2) primary and secondary road network, and 3) sites reserved for public space and facilities (open spaces, green spaces, etc.).



Source: M2PATE, 2007

Figure 4.4.6 Zoning Plan (Zoning Projection 2022) for K3 and K4 Neighbourhoods in Ivato Airport Commune

## (2) PUDé for Area along Tokyo Boulevard (Plan d'Urbanisme de Détail des Territoires du Bypass et de la Bretelle)

The current Bypass PUDé is the revision of the two PUDés developed in 2010 and 2011. In general, this PUDé identifies lands where new buildings are permitted or restricted along the bypass linking NR2 and NR7, known as Tokyo Boulevard. A total of 450 hectares of land near the bypass is now available for commercial, industrial, and administrative areas. This PUDé also regulates illegal and informal structures that are increasing on both sides of Tokyo Boulevard. Green spaces and other structures are also defined in this plan.

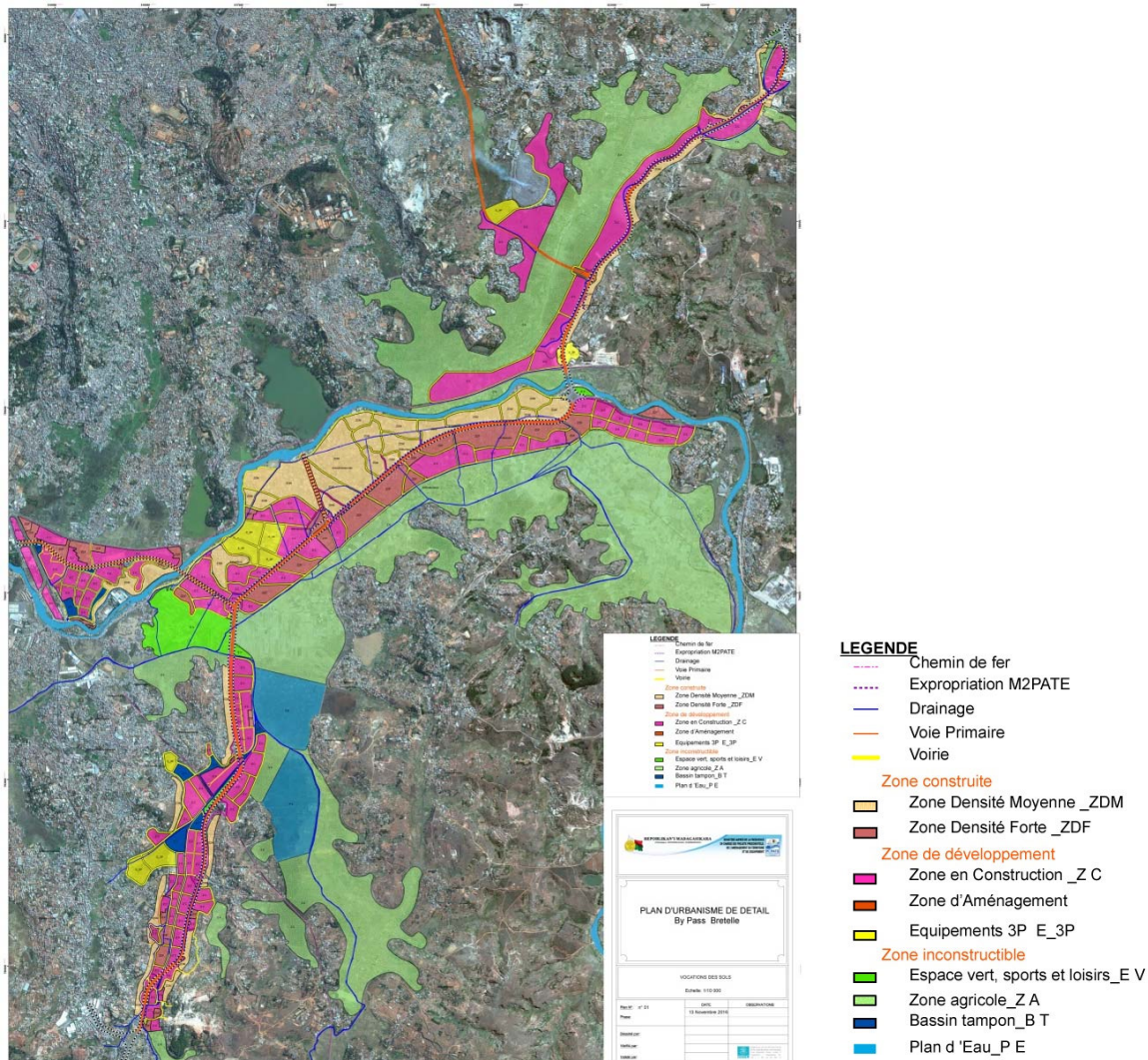
### 1) Purposes of this PUDé

- To revise the two existing PUDés after five years (in accordance with the regulatory framework)
- To bring solutions to the lack of space for development of activities and extension of the residential areas within Antananarivo Agglomeration
- To strengthen land use control and regulate illegal constructions along the bypass.

### 2) Development Principles

- To promote urban planning and development opportunities
- To keep the bypass road function by improvements of the embankment and sanitation
- To establish appropriate urbanization in order to overcome the pressures of city expansion by encouraging development which create employment and added values
- To create access roads to peripheral territories from the bypass road
- To promote high-rise construction for space-saving urbanization
- To promote clusters of economic activities and services for sustainable economic development and PPP approach by maintaining partnership with local residents' associations

- To improve the urban environment through creation of green spaces and infrastructure along the bypass
- To introduce a regulatory approach by physical measures (e.g.: installation of red beacons to protect the right of way)



Source: M2PATE, 2016

Figure 4.4.7 Zoning Plan in PUDé for Area along Tokyo Boulevard

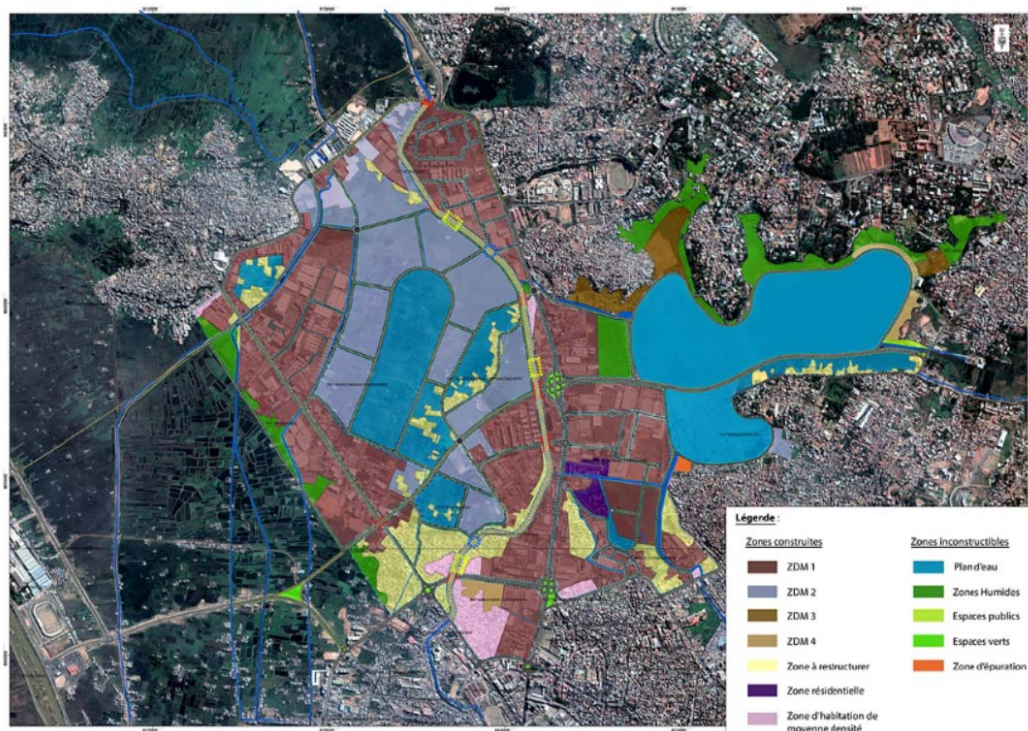
### (3) PUDé for Ankrondrano –Andraharo-Masay

PUDé for Ankrondrano-Andraharo-Massay (Plan d'urbanisme de Détail d'Ankrondrano - Andraharo - Masay) is in the process of finalization. This PUDé covers the area currently developing as a new urban centre in CUA, and will support the development of Ankrondrano as an important centre for Antananarivo Agglomeration.

The major objectives for development of this PUDé are as follows:

- To define development options to tackle the issues in economic and real estate development
- To define measures to support densification of the area
- To improve the traffic congestion situation in Antananarivo Agglomeration
- To open up the neighborhoods
- To promote economic development and job creation
- To identify rice fields which can change the classification for quality urbanisation





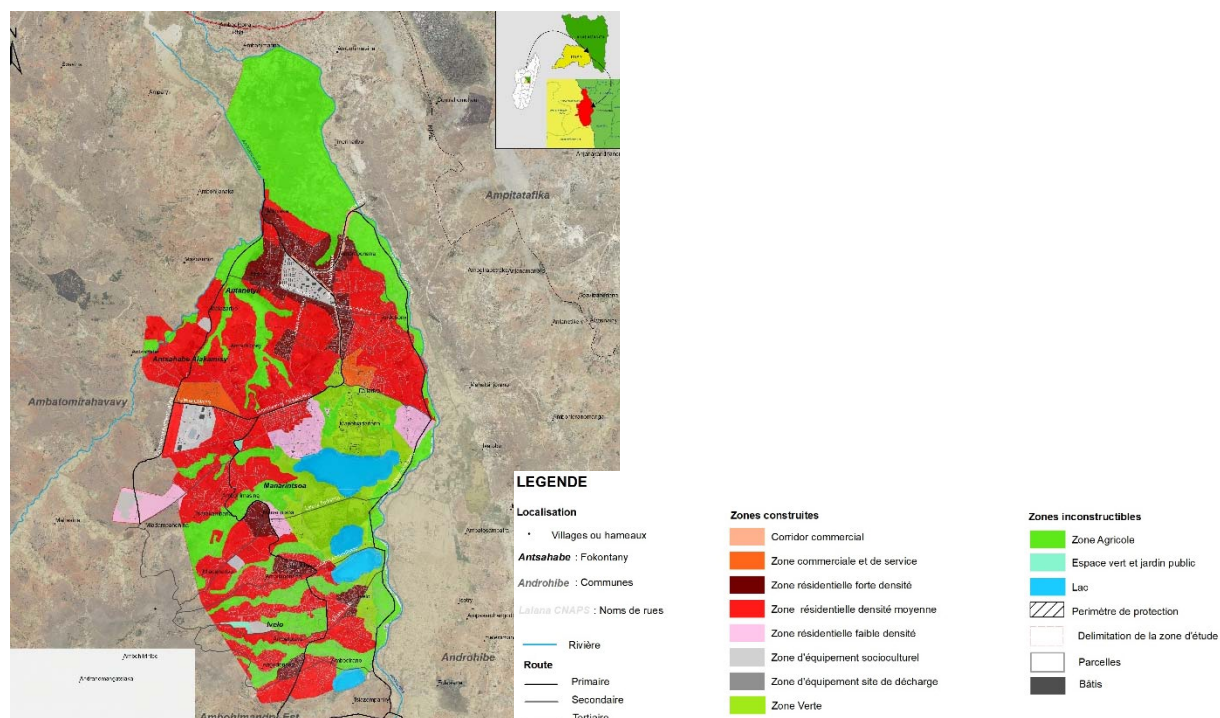
Source: Rafano, PUDé d'Ankorondrano-Andraharo-Masay

**Figure 4.4.8 Proposed Detailed Land Use Plan for PUDé Ankondrano-Andraharo-Masay**

During the formulation process of this PUDé, important elements from PUDi 2019 for Antananarivo Agglomeration were incorporated.

#### (4) PUDé for Vontovolona

PUDé for Vontovolona is one of the most recent PUDé prepared by MATHP. This PUDé covers most of Alakamisy Fenoarivo Commune.



Source: MAHTP, 2019

**Figure 4.4.9 Detailed Land Use Plan for PUDé Vontovorona**

#### 4.4.4 New City Development Project in Antananarivo Agglomeration –Tana-Masoandro –

Tana-Masoandro New City Project is a project proposed by the Presidential Project Team under the Andry Nirina Rajoelina's regime. The project aims to create a new city in the wetland on the west bank of Ikopa River covering 1,000ha including areas for 200,000 jobs and housing areas for 100,000 residents.

However the area is located in a flood prone area. Therefore, the simulation result of Sanitation Master Plan (PIAA: *Programme intégré d'assainissement d'Antananarivo*) 2 which is currently ongoing is necessary to determine the actual land which can be land filled.

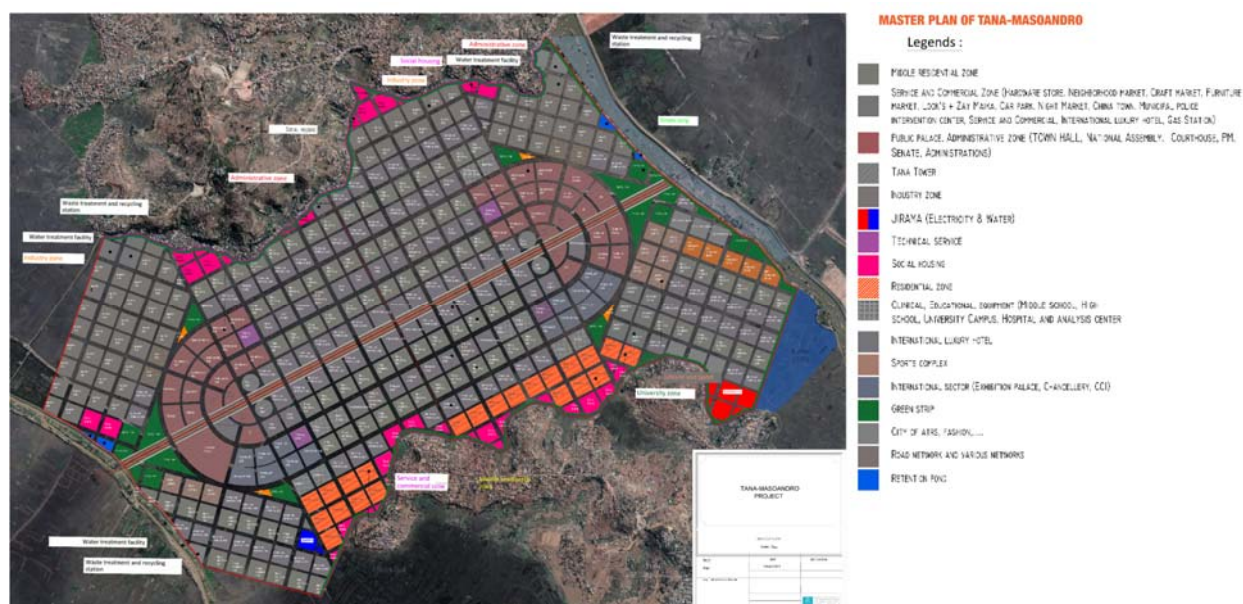
As for now, MAHTP has decided to prepare a decree to secure land of 289 ha for Tana-Masoandro development.



Source: Direction Generale en charge des Projets Presidentiels, New City Project Tana-Masoandro

Figure 4.4.10 Proposed Location of Tana-Masoandro





Source: Direction Generale en charge des Projets Presidentiels, New City Project Tana-Masoandro

Figure 4.4.11 Proposed Zoning Plan for Tana-Masoandro by DGPP

## 4.5 Review of Past and Existing Informal Settlement Improvement Projects in Antananarivo Agglomeration and National Housing Policy

### 4.5.1 Project Lalankely

In order to explore the direction of informal settlement improvement in Antananarivo Agglomeration by 2033, the "Project of Sanitation and Access Improvement of Priority Neighbourhoods in the Agglomeration of Antananarivo (DAQP)," known as Lalankely Phase I was launched in 2011 with cost of 9 million euros financed by AFD. The Phase II has been implemented since 2015, funded by additional 5 million euros from AFD. The objectives of the project include:

- To improve access and mobility in the neighbourhoods through the rehabilitation of access roads
- To construct infrastructure, including those for hygiene, accessibility, and drinking water supply; and build and rehabilitate community infrastructure, such as wash houses, standpipes, sanitary facilities, public lighting, etc.
- To achieve the sustainability of infrastructure by setting up community committees for their management and maintenance

In Phase I from 2010 to 2011, 78 fokontany from 110 fokontany in CUA and periphery communes were prioritized for the project. For Phase II project, the beneficiaries were chosen from the already selected fokontany as well as from the fokontany that have not benefited from the previous project.

Lalankely Phases I and II project has been carried out by AGETIPA under the supervision of M2PATE, in cooperation with international NGOs. It consists of three components: infrastructure, community management, and institutional support. In the infrastructure component, 446 infrastructure and facilities were constructed in 41 fokontany in CUA and 37 fokontany in other communes covered in Phase I, and 168 infrastructure were developed in 25 fokontany in CUA and 49 fokontany in 16 communes in Phase II. The infrastructure constructed included mobility infrastructure (such as pedestrian streets, stairs, walkways, roads and sidewalks) and sanitary facilities (i.e., channels, gutters, standpipes, latrines and showers, and garbage bins). The

infrastructure components implemented in Phases I and II are presented in Table 4.5.1 to Table 4.5.3.

The community management component supported the creation and enhancement of the committees for maintenance and management of public facilities, such as resident committees for water and sanitation system (RF2) and water user associations (WUAs). The project supported RF2 committees in conducting maintenance of sewerage channels, cleaning of allies and neighbourhoods, and collection of wastes, while providing assistance to WUAs for the management of fire hydrants, laundries, and sanitary blocks. In Phase I, 75 RF2 committees and 43 WUAs were organized; and Phase II planned to establish 46 RF2 and 29 WUAs.

The institutional support component was intended to conduct the project evaluation and identification and implementation of new projects, in addition to the contribution to the M2PATE's project, the National Urban Forum. However, the implementation of this component was less successful due to the ambiguous design of the contents of the component.<sup>2</sup>

### **(1) Achievements and Challenges of Lalankely Project Phases I and II**

Phases I and II of the Lalankely Project were positively evaluated, for the benefit of 600,000 residents and satisfying the needs of the beneficiaries in 108 neighbourhoods in CUA and in 14 peripheral communes. In the project, 596 works or 80% of the planned works were successfully implemented, while 20% of the works were cancelled or readjusted for land issues, problem with the implementation, and overlapping of components or activities with the other projects. As a result, the living conditions of the neighbourhoods are significantly improved.

However, sustainability of the project impact is questioned because of maintenance issues on the public facilities developed by the project. The management of the community committees and fund generation attribute to insufficient maintenance of the infrastructure. In particular, the poor maintenance work is anticipated to lead to the degradation of sanitary facilities, rather than mobility infrastructure. The rates of fee collection were about 50% to 60% at the highest, and were less than 40% in more than half of the committees, which are too low to have enough funds to conduct necessary maintenance of the facilities, since the fee payment is voluntary. Moreover, lack of coordination with the other projects caused the construction of too many standpipes beyond the capacity of water supply by JIRAMA, resulting in low water flow during the peak hours. Coordination and expansion of the capacity and resources of JIRAMA are also pointed out as issues, since construction of certain infrastructure has to wait for the completion of JIRAMA's tasks (such as creation of underground ditch for utility before the pavement of roads, settling of land arrangement, and other issues related to connections. In addition, two important issues identified are the limited role played by the communes, and lack of integration of grassroots actions into communal or intercommunal urban development initiatives. Because the communes were perceived as mere beneficiaries, the project did not improve their technical capacity to conduct maintenance of infrastructure (such as roads and water standpipes) that is under the responsibility beyond the community level. Due to that, there is a significant gap in technical services between CUA and the rural communes. Furthermore, intercommunal cooperation should be sought for waste management and road development.<sup>3</sup>

In the design and implementation of the projects, community level interventions should be well integrated into urban master plans at the agglomeration and commune levels. In particular, development of roads, water supply, and waste management in neighbourhoods should be coordinated with the future transport network plan, utility development of JIRAMA, and solid waste management at the agglomeration level. Moreover, capacity building of the communes, fokontany, and neighbourhoods should be strengthened for sustainability of the infrastructure and facilities to be constructed, since these actors are responsible for the management and maintenance

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<sup>2</sup> Mission pour l'évaluation finale du projet Lalankely I (DAQP I) et l'évaluation à miparcours du projet Lalankely II (DAQP II). RAPPORT FINAL DÉFINITIF. 2017.

<sup>3</sup> ditto

of these facilities and such technical service component was not fully implemented or less successful in the Lalankely Phases I and II, as already pointed out in the evaluation of the project.

As recommendation for the Phase III Project, besides the current components, the development of new infrastructure is proposed for improvement of security, social cohesion, and disaster risk reduction and urban amenities for sustainable development, such as community centres, tree planting at streets and public spaces, recreation space, and public lighting, etc. From the lessons learnt in Phases I and II, commune government is expected to play more active roles in the project management and, therefore, the capacity of committees and communes for management and maintenance should be improved. For example, training of road and maintenance personnel is suggested for the communes. Meanwhile, better coordination and improved communication should be promoted among stakeholders, such as committees, fokontany, commune, external organizations, and JIRAMA. Phase III is oriented to integrate urban development beyond improvement and rehabilitation of infrastructure and facilities at the community level. In addition to the preparation of urban plans of the communes, contribution to agglomeration level planning and governance is expected. The usage of a planning tool such as GIS, a study on land tenure issues, and the resolution of land issues before the commencement of the project are also suggested for the forthcoming coming project.<sup>4</sup>

**Table 4.5.1 Components of Lalankely Project Phase I**

Constructed Facilities	CUA		Periphery Communes		Total	
	No. of Fokontany Benefitted	Ratio (%)	No. of Fokontany Benefitted	Ratio (%)	No. of Fokontany Benefitted	Ratio (%)
Lanes/Sidewalk/Walkway	37	90%	27	73%	64	82%
Road	7	17%	18	49%	25	32%
Road and alleys	9	22%	19	51%	28	36%
Sanitation/Glab /Channel/Gutter	3	7%	3	8%	6	8%
Standpipes	16	39%	13	35%	29	37%
Sanitary Bloc	5	12%	2	5%	7	9%
Sanitary bloc+ Laundry	0	0%	2	5%	2	3%
Laundry	5	12%	7	19%	12	15%
Laundry +Standpipes	2	5%	0	0%	2	3%
Garbage bin	3	7%	4	11%	7	9%
Road (Conditional)	1	2%	9	24%	10	13%
Road and alleys (Conditional)	1	2%	1	3%	2	3%
Beneficiary Fokontany (Total)	41	100%	37	100%	78	100%

Source: Contrôle et surveillance des travaux de construction et de réhabilitation d'infrastructures de mobilité et d'infrastructures sanitaires Voies piétonnes et voies carrossables, bornes fontaines, blocs sanitaires, lavoirs, bacs à ordures (Lot 1 – Lot 2 – Lot 3) . Rapport Final. Juillet 2014. EGIS-Inframad.

**Table 4.5.2 Implemented Components of Lalankely Project Phase I**

Communes	Target Fokontany	Lanes/Sidewalk/Walkway	Road	Road & alleys	Sanitation (Sab/Channel/Gutter)	Stand-pipes	Sanitary Bloc	Sanitary bloc+ Laundry	Laundry	Laundry +Stand-pipes	Garbage Bin	Conditional	
												Road	Road & alleys
1 <sup>st</sup> Arrondissement	9	7	4	1	1	2	2	0	0	0	2	0	0
2 <sup>nd</sup> Arrondissement	4	4	2	0	0	0	0	0	0	0	0	0	0
3 <sup>rd</sup> Arrondissement	10	9	0	4	0	5	3	0	3	2	0	0	1
4 <sup>th</sup> Arrondissement	3	3	0	0	0	1	0	0	0	0	1	1	0
5 <sup>th</sup> Arrondissement	10	9	0	4	2	6	0	0	2	0	0	0	0
6 <sup>th</sup> Arrondissement	5	5	1	0	0	2	0	0	0	0	0	0	0
CUA	41	37	7	9	3	16	5	0	5	2	3	1	1
Ambohimangakely	1	1	0	1	0	0	0	0	0	0	0	0	0
Andoharanofotsy	3	3	2	2	2	0	0	0	0	0	0	0	0
Andranonahoatra	2	2	2	0	0	0	0	0	0	0	0	2	0
Ankadikely Ilafy	5	2	2	3	0	4	0	0	2	0	0	3	0

<sup>4</sup> Mission pour l'évaluation finale du projet Lalankely I (DAQP I) et l'évaluation à miparcours du projet Lalankely II (DAQP II). RAPPORT FINAL DÉFINITIF. 2017.

Ankaraobato	2	2	1	2	0	0	0	0	0	0	1	1	0
Anosizato andrefana	3	3	0	2	1	0	0	0	0	0	0	0	0
Antehiroka	2	2	2	1	0	1	0	0	0	0	0	0	0
Bemasoandro	3	3	1	1	0	0	0	0	0	0	0	0	0
Itaosy	2	1	2	0	0	0	0	0	0	0	1	0	0
Ivato aéroport	3	3	2	0	0	0	0	0	0	0	1	0	0
Ivato firaisana	1	0	1	0	0	0	0	0	0	0	0	0	0
Sabotsy Namehana	4	0	1	2	0	3	0	0	1	0	0	1	0
Talatamaty	2	1	2	2	0	2	0	0	1	0	0	0	0
Tanjombato	4	4	0	3	0	3	2	2	3	0	1	2	1
Total	78	64	25	28	6	29	7	2	12	2	7	10	2

Source: Contrôle et surveillance des travaux de construction et de réhabilitation d'infrastructures de mobilité et d'infrastructures sanitaires Voies piétonnes et voies carrossables, bornes fontaines, blocs sanitaires, lavoirs, bacs à ordures (Lot 1 – Lot 2 – Lot 3) . Rapport Final. Juillet 2014. EGIS Inframad.

**Table 4.5.3 Implemented Components of Lalankely Project Phase II**

Communes	Target Fokon-tany	Road	Road & Alleys	Lanes/ Pavement/ Walkway	Sanitation (Sab/ Channel/ Gutter)	Standpipes	Laundry	Sanitary Block +Laundry	Sanitary Block	Garbage Bin
1 <sup>st</sup> Arrondissement	7	0	0	1	1	2	1	0	0	0
2 <sup>nd</sup> Arrondissement	4	1	0	0	0	4	2	0	0	0
3 <sup>rd</sup> Arrondissement	4	1	1	0	0	0	0	0	1	0
4 <sup>th</sup> Arrondissement	3	2	0	1	0	2	2	0	0	0
5 <sup>th</sup> Arrondissement	6	3	0	1	2	3	0	0	1	1
6 <sup>th</sup> Arrondissement	2	2	0	0	0	1	0	0	0	0
CUA	26	9	1	3	3	12	5	0	2	1
Ambohimangakely	1	0	1	0	0	1	0	0	1	0
Andoharanofotsy	4	1	0	0	0	2	2	0	1	0
Andranonahoatra	5	5	0	0	0	0	0	0	0	0
Ankadikely Ifafy	5	2	2	3	0	1	1	0	0	0
Ankaraobato	3	2	1	0	0	0	0	0	0	0
Anosizato andrefana	3	0	0	1	0	3	1	0	2	0
Antehiroka	4	3	1	0	0	0	0	0	0	0
Bemasoandro	3	1	0	0	0	0	1	0	0	0
Itaosy	2	0	0	0	0	1	1	0	1	0
Ivato aéroport	4	3	1	4	0	0	0	0	0	0
Ivato Firaisana	1	1	0	0	0	0	0	0	0	0
Sabotsy Namehana	2	2	1	1	0	0	0	0	0	0
Talatamaty	7	4	2	3	0	1	0	0	0	0
Tanjombato	5	0	0	2	0	2	0	0	1	0
Total	75	33	10	17	3	23	11	0	8	1

Source: Contrôle et surveillance des travaux de construction et de réhabilitation d'infrastructures de mobilité et d'infrastructures sanitaires - Phase II Voies piétonnes et voies carrossables, bornes fontaines, blocs sanitaires, lavoirs, bacs à ordures. Rapport Final. Octobre 2016. EGIS Inframad.

## (2) Lalankely Phase III

Currently, the Project Phase III is under preparation. Although the target fokontany are specified, the components of the project for each commune have not been finalized yet. The proposed components are summarized in Table 4.5.4. The fokontany of Arrondissement I and IV, which are beneficiaries of PRODIUR by the World Bank, are excluded from the project.

**Table 4.5.4 Components of Lalankely Project Phase III**

Facilities to be Constructed		Improvement Proposed for 220 Target Fokontany		Suggested for Preliminary & Detailed Design Studies	Dropped Components (Does Not Meet DAQP Criteria)
		No.	Share (%)		
1	Road	266	13.7%	257	9
2	Pavement	99	5.1%	97	2
3	Bridges	31	1.6%	31	0
4	Retaining wall	73	3.8%	73	0
5	Public Spaces	23	1.2%	22	1
6	Public Lighting	331	17.0%	331	0
7	Sanitation	265	13.6%	220	45
8	Standpipes	323	16.6%	319	4
9	Laundry	53	2.7%	53	0
10	Sanitary Bloc	34	1.7%	33	1
11	Alleys	348	17.9%	347	1
12	Public Stairs	97	5.0%	97	0
Total		1,943	100.0%	1,880	63

Source: Version provisoire - Rapport d'étude environnementale, Novembre 2017, ENDA Ocean Indian, EGIS Inframad



Source: JICA Study Team based on data from Lalankely Project

**Figure 4.5.1 Target Fokontany of Lalankely Project Phases I, II, and III**

#### 4.5.2 PRODUIR Project

Integrated Urban Development and Resilience Project for Greater Antananarivo (PRODUIR: *Projet de résilience et de développement urbains intégrés dans l'agglomération d'Antananarivo*) is currently implemented by MAHTP with the support of the World Bank. The project contains the following components:

- Component 1 - Enhancing the Resilience of Informal Settlements in Priority Neighbourhoods
- Component 2 - Strengthening the Capacity of Antananarivo Agglomeration to Control Floods
- Component 3 - Supporting Communes of Antananarivo Agglomeration for Improved Communal and Metropolitan Governance
- Component 4 - Contingent Emergency Response Component
- Component 5 - Project Implementation, Monitoring and Evaluation

The project aims to improve the living conditions of the poor in selected low-income neighbourhoods of Antananarivo Agglomeration through enhancing basic service delivery and flood resilience; and to strengthen the Government's capacity for integrated urban management and effective response to eligible crises and emergencies.

#### 4.5.3 National Housing Policy in Madagascar

In Madagascar, lack of investments in the urban and housing sectors, understandably because of political and economic crises in last decades, resulted in a significant gap in housing supply for the middle and lower classes and the mushrooming of informal settlements. In order to address increasing housing needs, the National Housing Policy (NHP) is currently under preparation and a consultation workshop was held for the finalization of the policy in December 2017.

The draft NHP proposes the basic concepts on five objectives; three strategies for institutional, technical, and financial areas; and four fields of action with programme and project ideas. The objectives, fields of action, and programmes and projects are described below.

##### **Objectives:**

- 1) Improve the existing informal settlements and extend settlement areas;
- 2) Improve water supply rate;
- 3) Promote PPP approaches and financial mechanisms for housing provision, especially for low-income families;
- 4) Take into account the importance of urban transport (roads and railways); and
- 5) Integrate the institutional system for housing development.

#### 4.5.4 Urban Development and Housing Development Proposed by UN-Habitat

Assuming that urbanization in Madagascar will reach 50% in 2030, the vision for habitat and urban development sector envisages the achievement of access to affordable quality housing in adequate urban environment, as housing right for everyone. The seven levers are proposed as follows:

- A. Urban infrastructure: the creation of a coherent and development-friendly urban framework
  1. Diagnosis and update of the master plan for regional planning
  2. Establishment of a National Habitat Development Program for All
  3. Establishment of an office for the development of urban social infrastructures and management of the public spaces of the territory
- B. Access to housing: development of affordable housing and adapted financial support
  4. Establishment of a sovereign fund guarantee and financing of social housing



5. Establishment of a tax subsidy program for real estate projects with a high social mix
6. Establishment of a wealth management company dedicated to purchasing and leasing public real estate programs
- C. Transparency and intelligence of urban management: working to improve the performance of cities
7. Setting up a digital platform gathering and analyzing all the data relating to the operation of urban centers (land titles, buildings and functions, real estate transactions, mobility, etc.).

## **4.6 Review of Heritage Preservation Regulation for Antananarivo Agglomeration and Issues on Heritage Preservation**

### **4.6.1 Regulation on Secured Area and Area of Protection of Architectural Heritage, Urban and Landscaping in Antananarivo**

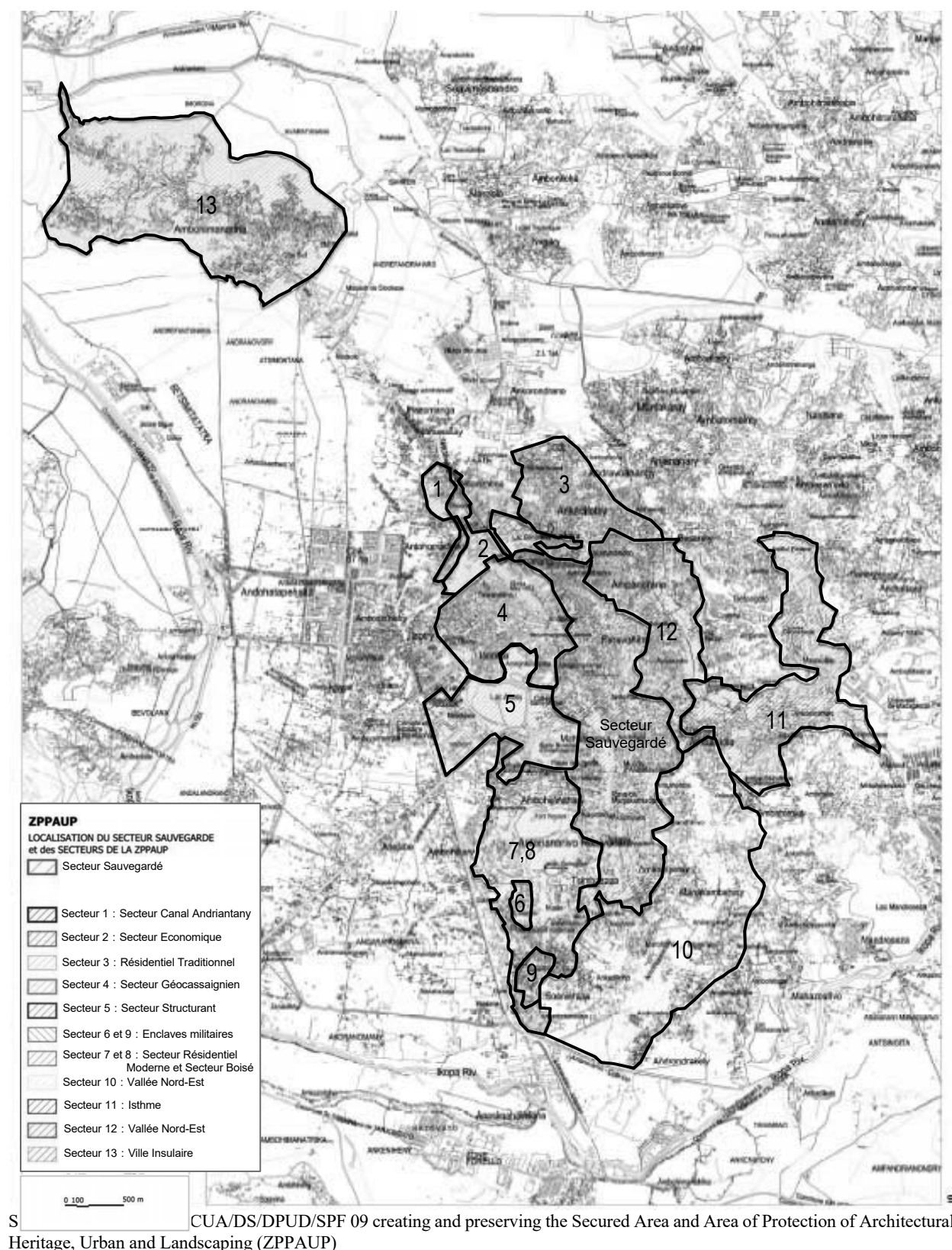
Antananarivo Agglomeration is rich in architectural, urban and landscape heritage, especially on the hill where Rova (Queen's Palace) is located. In order to preserve such areas, there is a decree (arrete) to preserve heritage areas in Antananarivo Agglomeration apart from the planning regulation, called *Arrete No. 515 - CUA/DS/DPUD/SPF 09* creating and preserving the Secured Area and Area of Protection of Architectural Heritage, Urban and Landscaping (ZPPAUP: *Zone de Protection du Patrimoine Architectural, Urbain et Paysager*) was established.

The purpose of the arrete is to determine the rules for the development of the saved area and the ZPPAUP, as stipulated in Article 3 of the arrete.

ZPPAUP, as listed in Article 1 of the arrete, has the following 13 zones:

- Zone 1: Canal Andriantany Zone
- Zone 2: Economic Zone
- Zone 3: Traditional residential
- Zone 4: Geocassainian Zone
- Zone 5: Structuring Zone
- Zone 6 and 9: Military enclaves
- Zone 7: Modern Residential Zone
- Zone 8: Wooded Zone
- Zone 10: North-East Valley
- Zone 11: Isthmus
- Zone 12: North-East Valley
- Zone 13: Insular city

The boundaries of the Secure Sector and the 13 Zones of ZPPAUP are as shown in Figure 4.6.1 .



**Figure 4.6.1 Location and Delineation of the Secured Area and 13 Zones of ZPPAUP**

### 1) Application of the Arrêté

As provided in Article 5 of the Order, in the secured area and the ZPPAUP area, the following items are regulated and to be applied for authorization for action:

- Alignment

- Building permit
- Rehabilitation and repair work
- Elevation and extension work
- Water connection
- Demolition

## **2) Items Regulated by the Arrete**

Article 6 of the arrete stipulates that all following works which have the effect of altering the condition of both built and unbuilt buildings as well as the public space need to be checked and authorized:

- Internal modifications consisting of:
  - additions and modifications to superstructure: poles, beams, floor, roofing and stairs;
  - addition of toilets and kitchen;
  - modifications of old decor elements; and
  - additions or felling of walls or partitions
- All work on façades and roofs, including cleaning and painting
- Fence
- Subdivisions
- Electrical and telecommunications networks and lines
- Deforestation and reforestation, clearing, pruning and cutting
- Public and private floor coverings
- Installation of fixed or mobile lighting and street furniture shelters, including urban signage

## **3) Power of Mayor of CUA**

The Mayor of CUA, as stipulated in Article 11, if he or she deems it useful, have the authority to proceed the following:

- Modify the scope of the secured area;
- Modify the boundaries of the ZPPAUP perimeter, sectors and indoor zoning;
- Modify the classification of buildings and non-buildings within the perimeters of the secured area and ZPPAUP areas;
- Conduct the process for the registration and / or classification of a building or site; and
- Make exceptions and changes to the requirements of this Order on a case-by-case basis, or on a perennial basis. In the latter case, the amended text shall replace the original text after the legal and administrative approach required. Where the legal and administrative the order will be deemed to take these changes into account and will be applied in result.

The Mayor, as stipulated in Article 12, may also constitute a temporary “ZPPAUP Commission,” if he or she deems it useful.

## **(2) Items to Regulate for the Secured Area**

The arrete provides for articles to regulate many aspects of the buildings in the designated area such as design, colour and material. To preserve the historic characteristics of the zone, many items are controlled. In the Secured Area, the following eight titles exists:

- Title 1: Delimitation of Work Permitted in the Safeguarding Sector and Principles
- Title 2: Extension, Elevation and New Construction: Prescriptions of Town Planning
- Title 3: Conservation and Restoration, Other Permitted Works: External Appearance of Buildings
- Title 4: Extension, Upliftment and Constructions News: External Aspects of Buildings

- Title 5: Businesses and Other Activities, Frontage and Signs
- Title 6: Fences and Gates
- Title 7: Treatment of Spaces and Landscapes
- Title 8: Advertising Provisions

#### **4.6.2 Regulation on Protection Perimeter of Sites Classified as National Heritage**

There is also a decree (arrete), which determines the necessity of protection perimeter for the sites classified as national heritage called Arrete No. 22 268/2012 concerning the Delimitation of the Protection Perimeter of Sites Classified as National Heritage (*Arrêté N° 22 268/2012 portant sur délimitation du périmètre de protection des sites classés patrimoine*).

The purpose of this arrete is to protect the area surrounding the national heritage. However, the protection perimeter for each heritage site is not determined by this arrete, and provides a range of 50 to 500 meters.

The article 4 of this arrete prohibits any kind of development within the protection perimeter.

#### **4.6.3 Issues on Historical Area Preservation in Antananarivo Agglomeration**

As mentioned in Section 4.6.1, 13 zones are designated and regulated by ZPPAUP. By the regulation, many items are regulated through permit procedures on development, rehabilitation, reconstruction, and demolition of mostly privately owned property. However, the following issues are observed:

- No clear information is sorted and maintained as database of the historic buildings and landscape which are regulated by the ZPPAUP
- Although the regulations are stipulated for each of the 13 zones, monitoring system does not seem to be functional and buildings that do not comply with the regulation area found.
- Incentives are not well prepared such as financial and technical support, although usually for heritage preservation, incentives are provided by the government because the private owners in the preservation area are restricted their development or construction right.

Besides ZPPAUP, there is a list of national heritage and a decree which stipulates the development within a particular perimeter from the national heritage site. However, the perimeter in the decree gives a range between 50 and 500 meters and is not determined for each sites. Therefore, it is necessary to be decided in many cases by each commune.

## Chapter 5 Future Vision, Growth Scenarios and Socio-Economic Framework for Antananarivo Agglomeration

### 5.1 Future Vision for Antananarivo Agglomeration

A vision statement is reflection of hope and dream, to be shared by people, which illuminates a direction for the future. A vision statement expressing aspiration for Antananarivo Agglomeration in 2033 is proposed below.

#### Statement of Future Vision

*In addition to the national centre of government and economy, Antananarivo Agglomeration will be a thriving production centre and a modern life centre, which is not only to support the welfare of people of Antananarivo Agglomeration, but also the national economy of Madagascar.*

*In order to develop such a centre, Antananarivo Agglomeration will create a competitive and vibrant economy, while seeking inclusive and sustainable development, by creating a healthy, resilient, interconnected urban structure and by preserving and strengthening its unique identity.*

This vision statement responds to the future vision and selected growth scenario for the Overall TaToM which was discussed in Section 3.4. It assumes that development of economic sectors of Antananarivo Agglomeration should be supported both by development of economic sectors and strengthening of logistics function of Toamasina Agglomeration and by strengthening of the transportation system of the TaToM Economic Axis (between Antananarivo and Toamasina).

Guided by the vision statement, the goals for Antananarivo Agglomeration are specified for four themes in order to articulate the development directions of each of them.

#### Goals

[Economy] Dynamic development of economic sectors is attained, by providing the seat of financial industry and business services and hosting national and regional headquarters of multinational and national corporations, by attracting investments in new economic sectors of industries and international tourism, as well as in the existing economic sectors of textile industry and agro-processing industry and by strengthening of transportation and economic infrastructure, such as major roads, access roads, electricity supply and water supply.

[Health and Resilience] Sustainable and healthy development is sought, not only by rehabilitating and upgrading sewerage and drainage infrastructures for better sanitation and reduction of inundation risk due to rainwater flooding and river flooding, but also by managing urban development for disaster risk reduction.

[Social] Inclusive development is attained by responding to the needs of a wide range of population within the restructured urban structure and by generating job opportunities for low-income families not only within the CUA, but also in urban centres outside the CUA.

[Spatial] A new poly-nuclear and well connected urban structure with amenity/ livable environment is built to achieve dynamic, sustainable, and inclusive development.

## **5.2 Alternative Growth Scenarios for Antananarivo Agglomeration**

### **5.2.1 Three Alternative Growth Scenarios for Antananarivo Agglomeration**

In order to select the most appropriate growth scenarios, three alternatives are proposed, corresponding to the three growth scenarios for the Overall TaToM Area discussed in Section 3.5.

#### **(1) Alternative Growth Scenario A for Antananarivo Agglomeration: Mega City Antananarivo**

This scenario aims to develop Antananarivo Agglomeration to the maximum extent possible.

The functions of business headquarters and economic production, as well as those of national political/government centre and commercial centre, will be enhanced largely by concentrating a larger amount of public investment for upgrading the level of infrastructure development and by attracting private investment to economic sectors in Antananarivo Agglomeration. By implementing this growth scenario, a highly efficient economic growth will be sought for Antananarivo Agglomeration, while Toamasina Agglomeration will play a functional gateway to Antananarivo, by focusing on development of the Port of Toamasina and its logistics function.

In addition to existing economic sectors, such as textile industries and ICT sector, much effort at development of economic sectors is made for Antananarivo Agglomeration by emphasizing the attraction of investments to agro-processing industries and light industries targeting middle-income populations in free trade areas of African and Indian Ocean countries. Under this growth scenario, Antananarivo Agglomeration would become the mono centre of Madagascar, which accumulates a large proportion of important economic production functions and urban populations into one location. In this sense, we call Antananarivo Agglomeration “Mega City Antananarivo.”

Therefore, Alternative Urban Structure A will have the characteristics listed below.

- A large Northern Bypass Road will connect National Road No. 2, National Road No. 3 and National Road No. 4. This will create new industrial land in the periphery of the agglomeration, especially in the area north of Ivato Airport, and in the north east area between National Road No. 2 and National Road No. 3. At the same time, this strong access to the National Road 2, linked to Toamasina Port.
- A large Southern Bypass Road from NR No. 2 to NR No. 7 will be constructed. Large scale industrial estates will be developed along this bypass road. At the same time, this bypass road will enhance the connectivity between Antananarivo, Toamasina and Antsirabe.

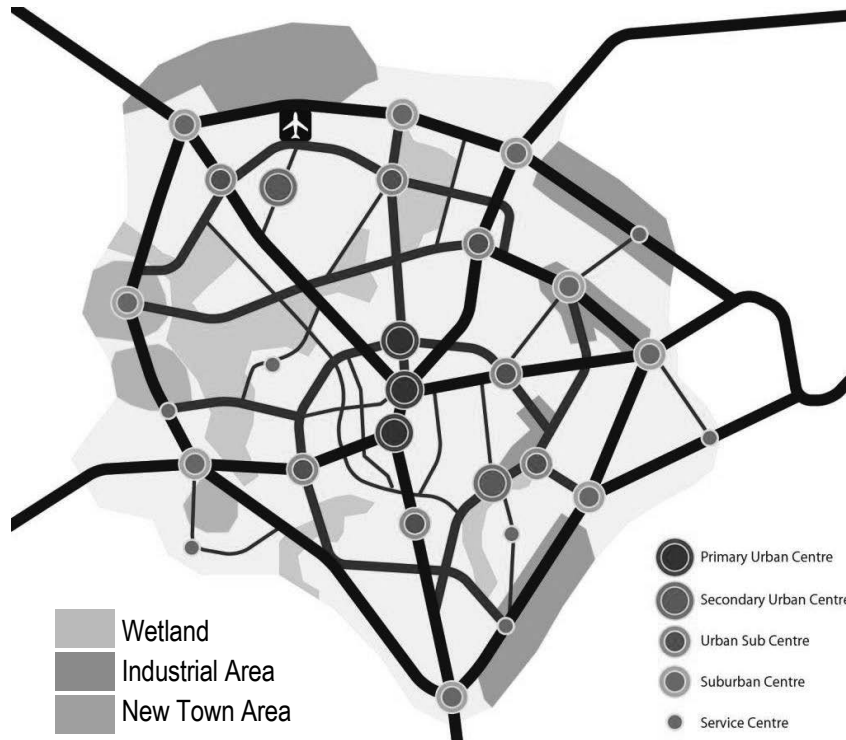


Figure 5.2.1 Alternative Urban Structure A for Antananarivo Agglomeration

## (2) Alternative Growth Scenario B for Antananarivo Agglomeration: Antananarivo Service Capital

In Growth Scenario B, Antananarivo Agglomeration will be developed as the centre for business headquarters and business supporting services in addition to national governmental centre and commercial/service centre. However, the development of manufacturing industries would be limited to expansion of existing textile industries by relocating to suburban areas. Instead, other agglomerations, such as Toamasina, Antsirabe and Moramanga, would become the location of manufacturing industries, such as textile, agro-processing and other light industries.

The services to be provided by Antananarivo Agglomeration include not only services and commerce to residential communities, but also functions of cooperate headquarters, banking and business support services. In this sense, for Growth Scenario B, we call Antananarivo Agglomeration “Antananarivo Service Capital.”

Therefore, Alternative Urban Structure B will have the characteristics listed below.

- The linear connection between Ivato Airport, Ivato business centre and the city centre will be strengthened, in order to enhance the service industry and trade and commerce industry. A new road running from National Road No. 4 and connecting to Ivato will be constructed.
- Strong radial roads will be constructed, especially to the western side of the city, giving the residential areas good access to the city centre.
- Industrial areas will concentrate along Tokyo Bypass, and also in the north east area.

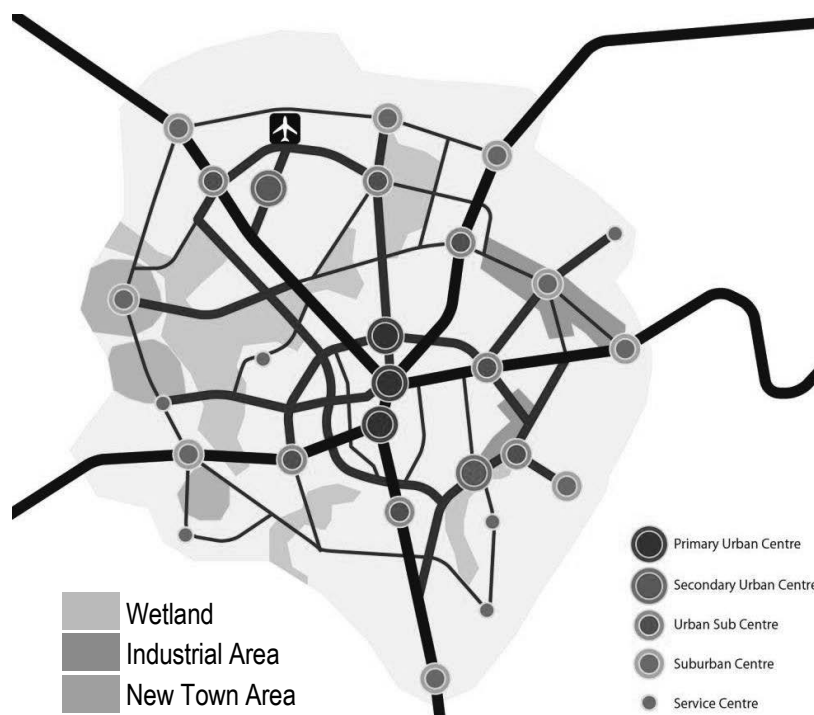


Figure 5.2.2 Alternative Urban Structure B for Antananarivo Agglomeration

### (3) Alternative Growth Scenario C for Antananarivo Agglomeration: Antananarivo Service-Industrial Metropolis

In Growth Scenario C, Antananarivo Agglomeration will accommodate a variety of industries and economic sectors, while for the Overall TaToM, balanced development between Toamasina and Antananarivo will be pursued.

Antananarivo Agglomeration will be able to attract additional manufacturing industries earlier than Toamasina Agglomeration because Antananarivo Agglomeration has relatively good infrastructure and well-educated/trained human resources than Toamasina Agglomeration in the first 10 years.

Furthermore, it will be necessary for Antananarivo Agglomeration to continue to develop its functions to provide high-level business services and to locate business headquarters within CUA and surrounding urban sub-centres, as well as to accommodate manufacturing industries outside CUA for the purpose of creating jobs for increasing urban populations in Antananarivo Agglomeration. In this sense, we call it Antananarivo Service-Industrial Metropolis.

Therefore, Alternative Urban Structure C will have the characteristics listed below.

- A Northern Bypass Road will connect National Road No. 2, National Road No. 3 and National Road No. 4. This bypass road is relatively small compared to that of Urban Structure A, starting from the current intersection of the National Road No. 2 and Tokyo Bypass, and passing through the Urban Sub-centres. This will create new industrial land in the periphery of the agglomeration, especially in the area north of Ivato Airport, and in the north east area between National Road No. 2 and National Road No. 3. At the same time, this strong access to the National Road 2, linked to Toamasina Port.
- A Southern Bypass Road from NR No. 2 to NR No. 7 will be constructed. This will be a relatively small bypass road compared to Alternative Urban Structure A, as the road derives from the current intersection of the National Road No.2 and Tokyo Bypass. Large scale industrial estates will be developed along this bypass road. At the same time, this bypass road will enhance the connectivity between Antananarivo, Toamasina and Antsirabe.



- The linear connection between Ivato Airport, Ivato business centre and the city centre will be strengthened, in order to enhance the service industry and trade and commerce industry. A new road running from National Road No. 4 and connecting to Ivato will be constructed.
- Strong radial roads will be constructed, especially to the Western side of the city, giving the residential areas good access to the city centre.

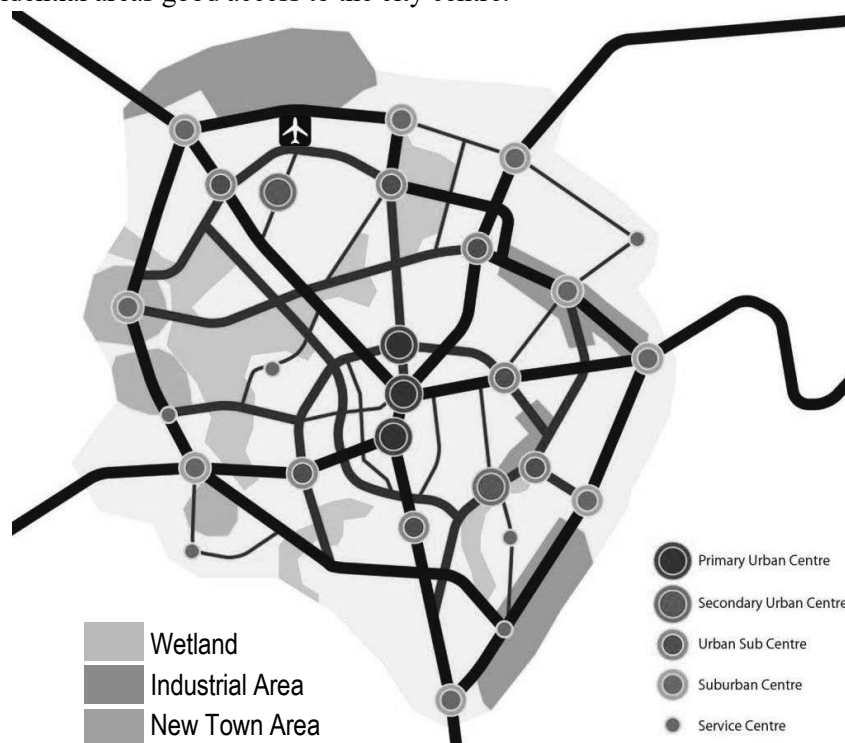


Figure 5.2.3 Alternative Urban Structure C for Antananarivo Agglomeration

## 5.2.2 Selected Growth Scenario for Antananarivo Agglomeration (Growth Scenario C)

Considering the existing conditions, development trends and potentials, development plans and proposed projects, and the implementability, Growth Scenario C is selected as the most appropriate for Antananarivo Agglomeration.

Along with the rapid population growth of the entire Madagascar, the influx of migration to Antananarivo Agglomeration has continued, due to its relatively good conditions of the economy and infrastructure. This trend is expected to continue in the future.

In order to continuously create employment opportunities for the increasing population in the agglomeration and to revitalize the urban economy, Antananarivo Agglomeration needs new export-oriented industries which can lead not only its own urban economy, but also Madagascar's national economy. The export-oriented industry should target the growing regional markets of recently developing "Free Trade Areas" in African and the Indian Ocean countries. Madagascar is a member country of SADC, COMESA and IORA, as well as AfCFTA.

In the last more than two decades, low-cost manufacturing has been dominated by countries endowed with low-wage and hard-working labour force, such as China, South-east Asia and South Asian countries. However, low-cost manufacturing companies are looking for countries suitable for their locations in the next to China because of the increase in their wage levels. Madagascar is a good candidate for such low-cost manufacturing industries.

Both Antananarivo Agglomeration and Toamasina Agglomeration have developmental potentialities as the location of such industries. However, these two agglomerations have the following different characteristics in terms of industrial location:

- Toamasina Agglomeration has a higher advantage than Antananarivo Agglomeration as the industry location from the aspects of the proximity and connectivity to the regional markets, because Antananarivo is 350 km away from the Port of Toamasina and the transportation capacities (volume, speed, cost, safety and resilience of transportation for passengers and cargo) of National Road No. 2 and the existing railway are limited.
- A cheap and abundant labour force is already available and infrastructure is relatively developed in Antananarivo Agglomeration.

By responding to these different characteristics of the two agglomerations, “Growth Scenario C” will make the following two different efforts at developing economic sectors for the two agglomerations:

- Industrial development will be promoted gradually with phased development of industrial infrastructure in Toamasina Agglomeration.
- Antananarivo Agglomeration will take advantage of existing infrastructure, human resources, business support functions<sup>1</sup> and so forth. And investment to the economic sectors and efforts to attract industries will be actively promoted from the short-term in Antananarivo Agglomeration, and those industries will be developed in the mid- and long-terms.

At the same time, by upgrading business support functions in addition to the function as the centre of politics and government, Antananarivo Agglomeration will support not only the economic sectors in Antananarivo Agglomeration, but also the industries in Toamasina Agglomeration and other areas, and will attract investment not only to Antananarivo Agglomeration, but also to other areas including Toamasina Agglomeration. Then more highly advanced service industries, such as health, education and research, should be developed within CUA for attracting investments to economic sectors in Antananarivo Agglomeration. It is also necessary to develop and distribute commercial and service functions outside CUA for supporting the lives of people.

## **5.3 Socio-economic Framework for Antananarivo Agglomeration**

### **5.3.1 Population Framework for Antananarivo Agglomeration**

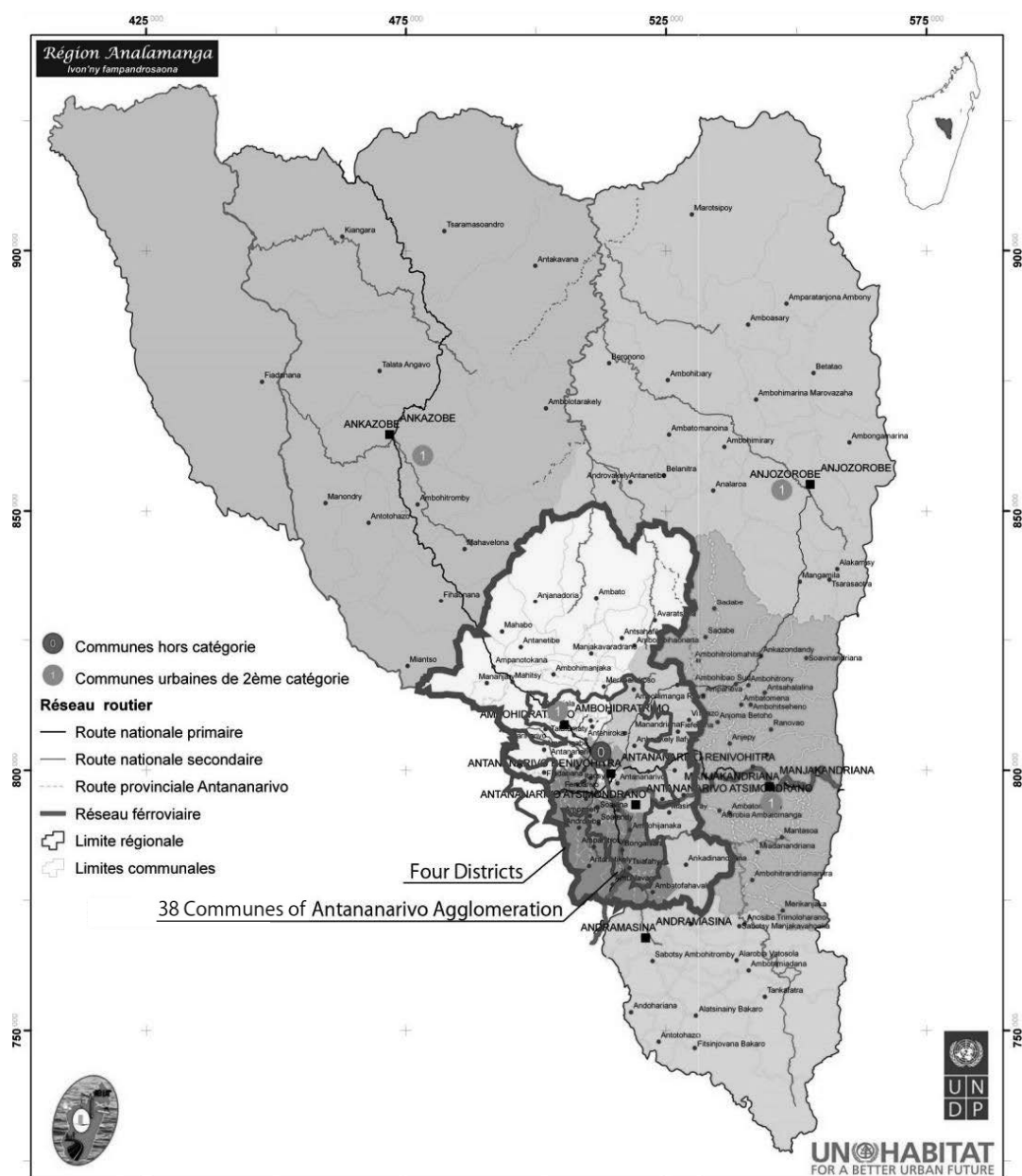
#### **(1) Current Population in Analamanga Region**

##### **1) Population of Antananarivo Agglomeration within Madagascar and Analamanga Region**

The capital city of Madagascar, Antananarivo is located in Analamanga Region. Analamanga Region has eight districts. Antananarivo Agglomeration spreads across four districts of Analamanga Region, namely Antananarivo-Atsimodrano District, Antannarivo-Avaradrano District, Antananarivo-Renivohitra District and Ambohidratrimo District, and also Arivonimamo District of Itasy Region. (See Figure 5.3.1.)

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<sup>1</sup> Business support functions include administrative and management, financing, accounting and legal services, logistics, ITC, marketing, research & development, etc., which are highly specialized and provided by professionals and experts in each of the fields.



Source: JICA Study Team utilizing « Etat des Lieux Analamanga », UN-Habitat, 2014

**Figure 5.3.1 Location of Four Districts of Analamanga Region and 38 Communes**

The populations in both Analamanga Region and Itasy Region are concentrated in the districts where the 38 communes are located. The district with the largest population is Antananarivo-Renivohitra which covers Antananarivo Urban Commune (CUA: *Commune Urbaine d'Antananarivo*). Its population is approximately 1.3 million in 2018. On the other hand, according to the two previous censuses conducted in 1975 and 1993, districts with the highest rate of population growth was Miarinarivo District in Itasy Region followed by Soavinandriana District also in Itasy Region. Within Analamanga Region, Ankazobe District had the highest population growth rate. This has changed greatly in the next 25 years and the population growth rate of Analamanga Region became larger compared to Itasy Region. This is assumed to be due to urbanisation. The district with the highest population growth rate between 1993 and 2018 is Antananarivo-Avaradrano followed by Antananarivo-Atsimondrano and Ambohidratrimo, which are districts Antananarivo Agglomeration belongs to. (See Table 5.3.1)

**Table 5.3.1 Population by District of Analamanga Region and Itasy Region**

District	Population			Annual Population Growth Rate		Area (km <sup>2</sup> )	Population Density (person/ha)
	1975 <sup>1</sup> (Census)	1993 <sup>2</sup> (Census)	2018 <sup>3</sup> (Census Preliminary Result)	1975-93	1993-2018		
<b>Ambohidratrimo</b>	<b>113,990</b>	<b>185,145</b>	<b>441,682</b>	<b>2.73%</b>	<b>3.54%</b>	<b>1,432</b>	<b>3.08</b>
Andramasina	71,481	109,444	168,161	2.39%	1.73%	1,406	1.20
Anjozorobe	62,910	114,311	225,792	3.37%	2.76%	4,275	0.53
Ankazobe	46,707	87,315	195,418	3.54%	3.28%	7,358	0.27
<b>Antanaarivo-Atsimondrano</b>	<b>231,080</b>	<b>229,597</b>	<b>642,364</b>	<b>2.44%</b>	<b>4.01%</b>	<b>422</b>	<b>1,522</b>
<b>Antananarivo-Avaradrano</b>		<b>163,471</b>	<b>449,425</b>		<b>4.13%</b>	<b>582</b>	<b>7.72</b>
<b>Antananarivo-Renivohitra</b>	<b>451,808</b>	<b>710,236</b>	<b>1,275,207</b>	<b>2.54%</b>	<b>2.37%</b>	<b>85</b>	<b>150.02</b>
Manjakandriana	121,066	159,406	220,079	1.54%	1.30%	1,799	1.22
<b>Analamanga Region</b>	<b>1,099,042</b>	<b>1,758,925</b>	<b>3,617,919</b>	<b>2.65%</b>	<b>2.93%</b>	<b>17,360</b>	<b>2.08</b>
Miarinarivo	65,399	142,461	293,318	4.42%	2.93%	2,579	1.13
<b>Arivonimamo</b>	<b>130,268</b>	<b>204,601</b>	<b>354,097</b>	<b>2.54%</b>	<b>2.22%</b>	<b>2,135</b>	<b>1.66</b>
Soavinandriana	57,563	115,732	250,547	3.96%	3.14%	1,870	1.33
<b>Itasy Region</b>	<b>231,092</b>	<b>462,794</b>	<b>897,731</b>	<b>3.93%</b>	<b>2.69%</b>	<b>6,585</b>	<b>1.36</b>

Source 1: Institut national de la statistique et de la recherche économique, Recensement General de la Population et des Habitats 1975

Source 2: Direction Generale de l'Institut National de la Statistique, Recensement General de la Population et de l'Habitats 1993

Source 3: INSTAT, 2019, Troisieme Recensement General de la Population et des Habitats (RGPH-3) Resultats Provisaires

## 2) Population Distribution in Antananarivo Agglomeration

Although the final results of population and housing census 2018 is yet to be released, based on the census surveys conducted, INSTAT had projected that the population of Antananarivo Agglomeration was around 2.6 million in 2018. The population was projected to have increased by 3.50% per annum from 1993 to 2018.

Around half of the population in Antananarivo Agglomeration is concentrated in CUA with approximately 1.3 million inhabitants in 2018. Another commune with relatively large number of population is Ambohimangakely in Avaradrano District with approximately 110,000 inhabitants. Ambohimangakely's population has been also increasing rapidly with annual growth rate of approximately 7% in the past 25 years. It is located neighbouring CUA on the east side.

The population density is also high in CUA with 150 person/ha. However, Bemasandro Commune on the west bank of Ikopa River neighbouring CUA is projected to have higher population density than CUA with over 200 person/ha. Furthermore, three other communes in Atsimondrano District, namely, Ankaraobato, Anosizato Andrefana and Andranonahaotra have population densities around 145 person/ha similar to CUA. Anosizato Andrefana and Andranonahaotra are also located on the west side of Ikopa River next to CUA, while Ankaraobato is located south of CUA next to Tanjombato.

## 3) Population Growth Rates

The average annual population growth rate of CUA in the last 25 years is 2.39% while some communes surrounding CUA such as Bongatsara, Ambohimangakely and Ambatomirahavavy have extremely high growth rates of over 6% per annum. These communes are located along the national roads.

**Table 5.3.2 Population by Commune of Antananarivo Agglomeration**

Commune	District	Area (ha)	Population		Population Growth Rate 1993-2018	Population Density (person/ha) 2018
			Census	Projection		
			1993	2018		
Antananarivo (CUA)	Antananarivo Renivohitra	8,494	710,236	1,275,207	2.37%	150.1
Ambatolampy	Ambohidratrimo	1,947	6,515	25,798	5.66%	13.2
Ambohidratrimo	Ambohidratrimo	1,223	6,381	22,176	5.11%	18.1
Ambohitrimanjaka	Ambohidratrimo	2,266	17,594	36,970	3.01%	16.3
Ampangabe	Ambohidratrimo	4,641	6,509	17,152	3.95%	3.7
Anosiala	Ambohidratrimo	5,459	12,509	51,288	5.81%	9.4
Antehiroka	Ambohidratrimo	1,638	17,577	46,550	3.97%	28.4
Ivato	Ambohidratrimo	1,000	17,088	47,615	4.18%	47.6
Talatataty	Ambohidratrimo	1,106	17,632	51,181	4.35%	46.3
Alakamisy Fenoarivo	Atsimondrano	1,259	6,502	22,511	5.09%	17.9
Ambavahaditokana	Atsimondrano	620	11,638	39,257	4.98%	63.4
Ambohidrapeto	Atsimondrano	398	8,901	28,234	4.73%	70.9
Ambohijanaka	Atsimondrano	2,803	8,185	19,381	3.51%	6.9
Ampanefy	Atsimondrano	1,084	5,219	15,758	4.52%	14.5
Ampitatafika	Atsimondrano	1,987	29,094	62,937	3.13%	31.7
Andoharanofotsy	Atsimondrano	738	14,916	46,247	4.63%	62.6
Andronanahoatra	Atsimondrano	383	21,818	57,139	3.93%	149.2
Ankadimanga	Atsimondrano	279	4,121	7,745	2.56%	27.7
Ankaraobato	Atsimondrano	277	12,270	42,433	5.09%	153.2
Anosizato Andrefana	Atsimondrano	175	-	26,498	-	151.7
Bemasoandro	Atsimondrano	346	19,160	51,573	4.04%	149.2
Bongatsara	Atsimondrano	2,547	4,004	26,680	7.88%	10.5
Fenoarivo	Atsimondrano	1,717	10,490	31,650	4.52%	18.4
Fiombonana	Atsimondrano	461	2,880	12,084	5.90%	26.2
Itaosy	Atsimondrano	552	11,638	16,520	1.41%	29.9
Soalandy	Atsimondrano	1,367	4,297	15,135	5.17%	11.1
Soavina	Atsimondrano	412	4,155	17,569	5.94%	42.6
Tanjombato	Atsimondrano	457	19,106	43,406	3.34%	94.9
Tsiafahy	Atsimondrano	5,870	8,314	20,114	3.60%	3.4
Alasora	Avaradrano	2,209	16,906	58,316	5.08%	26.4
Ambohimambola	Avaradrano	1,743	7,289	15,815	3.15%	9.1
Ambohimanga Rova	Avaradrano	4,650	9,874	30,130	4.56%	6.5
Ambohimangakely	Avaradrano	3,420	20,856	111,718	6.94%	32.7
Ankadikely	Avaradrano	3,293	27,422	55,740	2.88%	16.9
Anosy Avaratra	Avaradrano	871	4,353	16,881	5.57%	19.4
Manandriana	Avaradrano	1,364	2,691	9,149	5.02%	6.7
Sabotsy Namehana	Avaradrano	1,397	16,906	46,819	4.16%	33.5
Ambatomirahavavy	Arivonimamo	6,345	7,000	36,869	6.87%	5.8
Antananarivo Agglomeration		76,797	1,132,046	2,558,245	3.32%	33.3

Source 1: Direction Generale de l'Institut National de la Statistique, Recensement General de la Population et de l'Habitats 1993

Source 2: JICA Study Team based on INSTAT population projection and census survey preliminary result

## (2) Population Framework for Antananarivo Agglomeration

The population framework for Antananarivo Agglomeration for 2033 is set based on the following factors:

- Population framework by region determined in Table 3.6.4
- Past trend of population growth in each commune of Analamanga Region
- Future growth potential of Antananarivo Agglomeration based on the vision and growth scenario selected in Section 5.2

Table 5.3.3 shows the future population framework for Antananarivo Agglomeration in the short, medium and long term (2023, 2028 and 2033). The population of Antananarivo Agglomeration is expected to reach 3 million by 2033 and become 4,151 thousand in 2033. The population outside CUA is to increase much rapidly compared with that of CUA.

**Table 5.3.3 Future Population Framework for Antananarivo Agglomeration**

		2018	2023	2028	2033
CUA	Population	1,275,207	1,426,472	1,586,890	1,763,099
	Annual Growth Rate	-	2.27%	2.15%	2.13%
Outside CUA	Population	1,283,038	1,596,175	1,960,581	2,388,368
	Annual Growth Rate	-	4.46%	4.20%	4.03%
Antananarivo Agglomeration	Population	2,558,245	3,022,647	3,547,471	4,151,467
	Annual Growth Rate	-	3.39%	3.25%	3.19%

Source: JICA Study Team

From the above framework and future land use pattern based on locational condition, future population by commune of Antananarivo Agglomeration was prepared as shown in Table 5.3.4.

**Table 5.3.4 Future Population of Antananarivo Agglomeration by Commune (2033)**

Commune	District	Area	Population		Annual Population Growth Rate	Population Increase	Population Density
		ha	2018	2033	2018-2033	2018-2033	Pop/ha
Antananarivo (CUA)	Antananarivo Renivohitra	8,494	1,275,207	1,763,099	2.18%	487,892	<b>207.6</b>
Ambatolampy	Ambohidratrimo	1,947	25,798	59,974	5.79%	34,176	30.8
Ambohidratrimo	Ambohidratrimo	1,223	22,176	47,749	5.25%	25,573	39.1
Ambohitrimanjaka	Ambohidratrimo	2,266	36,970	58,777	3.14%	21,807	25.9
Ampangabe	Ambohidratrimo	4,641	17,152	31,468	4.13%	14,316	6.8
Anosiala	Ambohidratrimo	5,459	51,288	<b>120,600</b>	5.87%	69,312	22.1
Antehiroka	Ambohidratrimo	1,638	46,550	84,838	4.08%	38,288	51.8
Ivato	Ambohidratrimo	1,000	47,615	89,135	4.27%	41,520	89.1
Talatamaty	Ambohidratrimo	1,106	51,181	98,196	4.44%	47,015	88.8
Alakamisy Fenoarivo	Atsimondrano	1,259	22,511	45,136	4.75%	22,625	35.9
Ambavahaditokana	Atsimondrano	620	39,257	80,113	4.87%	40,856	<b>129.3</b>
Ambohidrapeto	Atsimondrano	398	28,234	65,726	5.79%	37,492	<b>165.1</b>
Ambohijanaka	Atsimondrano	2,803	19,381	43,750	5.58%	24,369	15.6
Ampanefy	Atsimondrano	1,084	15,758	45,288	<b>7.29%</b>	29,530	41.8
Ampitatafika	Atsimondrano	1,987	62,937	<b>101,310</b>	3.22%	38,373	51.0
Andoharanofotsy	Atsimondrano	738	46,247	76,868	3.45%	30,621	<b>104.1</b>
Andranonahoatra	Atsimondrano	383	57,139	59,018	0.22%	1,879	<b>154.1</b>
Ankadimanga	Atsimondrano	279	7,745	16,052	4.98%	8,307	57.5
Ankaraobato	Atsimondrano	277	42,433	52,823	1.47%	10,390	<b>190.7</b>
Anosizato Andrefana	Atsimondrano	175	26,498	35,050	1.88%	8,552	<b>200.7</b>
Bemasoandro	Atsimondrano	346	51,573	58,058	0.79%	6,485	<b>167.9</b>
Bongatsara	Atsimondrano	2,547	26,680	88,915	<b>8.36%</b>	62,235	34.9
Fenoarivo	Atsimondrano	1,717	31,650	39,803	1.54%	8,153	23.2
Fiombonana	Atsimondrano	461	12,084	19,787	3.34%	7,703	42.9
Itaosy	Atsimondrano	552	16,520	22,015	1.93%	5,495	39.9
Soalandy	Atsimondrano	1,367	15,135	29,779	4.62%	14,644	21.8
Soavina	Atsimondrano	412	17,569	36,565	5.01%	18,996	88.7
Tanjombato	Atsimondrano	457	43,406	48,774	0.78%	5,368	<b>106.7</b>
Tsiafahy	Atsimondrano	5,870	20,114	28,333	2.31%	8,219	4.8
Alasora	Avaradrano	2,209	58,316	<b>124,056</b>	5.16%	65,740	56.1
Ambohimanambola	Avaradrano	1,743	15,815	26,212	3.43%	10,397	15.0
Ambohimanga Rova	Avaradrano	4,650	30,130	59,579	4.65%	29,449	12.8
Ambohimangakely	Avaradrano	3,420	<b>111,718</b>	<b>269,614</b>	<b>6.05%</b>	<b>157,896</b>	78.8
Ankadikely	Avaradrano	3,293	55,740	86,758	2.99%	31,018	26.3
Anosy Avaratra	Avaradrano	871	16,881	39,058	5.75%	22,177	44.9
Manandriana	Avaradrano	1,364	9,149	19,817	5.29%	10,668	14.5
Sabotsy Namehana	Avaradrano	1,397	46,819	87,518	4.26%	40,699	62.7
Ambatomirahavavy	Arivonimamo	6,345	36,869	91,858	<b>6.27%</b>	54,989	14.5
Outside CUA		68,303	1,250,178	2,388,370	4.23%	1,105,332	35.0
Antananarivo Agglomeration		76,797	2,558,245	4,151,469	3.28%	1,593,224	54.1

Source: JICA Study Team

## 5.3.2 Economic Framework for Antananarivo Agglomeration

### (1) Current Economic Condition of Antananarivo Agglomeration

Analamanga Region's share of Gross Regional Domestic Product (GRDP) to national GDP was 41.7 percent in 2014. The GRDP in 2014 amounts to 11,874 billion Ariary at current prices.

While the population of Analamanga Region accounts for 15.5% of the national population, Analamanga Region produces more than half of the GDP share for the secondary sector and tertiary sector. (See Table 5.3.5)

**Table 5.3.5 Analamanga Region's Share of GRDP to National GDP (2014)**

(GDP at Factor Cost, MGA Billion at current prices)

Region	Primary Sector		Secondary Sector		Tertiary Sector		Total	Share
Analamanga	484	6.0%	2,274	57.8%	9,116	55.2%	11,874	41.7%
Others	7,573	94.0%	1,661	42.2%	7,396	44.8%	16,630	58.3%
Total	8,057	100.0%	3,935	100.0%	16,512	100.0%	28,504	100.0%

Note: National GDP in 2014 at 2007 constant prices amounted to MGA 17,368 billion.

Source: JICA Study Team based on National Statistics Institute (INSTAT) (June, 2018)

Although the data are over 20 years old, in 1993 CUA already had over 68% of the household heads employed in the tertiary sector. The number of people engaged in manufacturing sector was also relatively high (approximately 15% of household heads) in three districts out of four districts of Antananarivo Sub-Region, namely, CUA (Antananarivo Renivohitra District), Avaradrano District and Atsumodrano District.

On the other hand, Ambohidratrimo District had the highest share (approximately 57%) of household heads engaged in the primary sector.

**Table 5.3.6 Economic Activities of Household Heads in Analamanga Region (1993)**

Arrondissement / District	Primary Sector	Secondary Sector					Tertiary Sector				
			Mining	Manufacturing	Electricity & Water	Buildings & Public Works		Commercial	Transport & Communication	Services	N/A
Antananarivo I	1.67%	20.75%	0.71%	13.83%	1.01%	5.20%	73.14%	<b>25.83%</b>	11.18%	<b>36.13%</b>	4.44%
Antananarivo II	3.70%	23.17%	0.51%	12.46%	<b>2.62%</b>	7.59%	69.00%	16.55%	8.52%	<b>43.93%</b>	4.13%
Antananarivo III	1.50%	21.42%	0.50%	14.76%	1.30%	4.86%	73.03%	<b>24.11%</b>	11.05%	<b>37.86%</b>	4.06%
Antananarivo IV	2.61%	25.33%	1.64%	14.45%	1.30%	7.94%	69.55%	<b>25.24%</b>	10.25%	34.06%	2.51%
Antananarivo V	3.28%	27.87%	1.40%	<b>17.21%</b>	1.18%	<b>8.09%</b>	65.60%	20.41%	<b>12.19%</b>	33.00%	3.25%
Antananarivo VI	9.50%	31.33%	0.72%	<b>21.20%</b>	1.05%	<b>8.35%</b>	56.72%	19.55%	<b>13.11%</b>	24.06%	2.46%
Antananarivo Renivohitra	3.20%	24.56%	0.96%	15.43%	1.33%	6.85%	68.67%	22.51%	11.11%	35.05%	3.56%
Antananarivo-Avaradrano	<b>43.74%</b>	24.11%	1.88%	14.99%	1.12%	6.11%	30.37%	9.85%	5.43%	15.09%	1.78%
Ambohidratrimo	<b>56.81%</b>	14.30%	1.26%	8.17%	0.25%	4.61%	27.13%	6.99%	5.46%	14.67%	1.76%
Antananarivo-Atsimondrano	30.91%	25.43%	<b>2.12%</b>	15.23%	0.67%	7.41%	40.87%	14.55%	7.86%	18.45%	2.79%
4 Districts (Antananarivo Sub-Region)	22.17%	23.07%	1.35%	14.20%	1.01%	6.51%	54.76%	16.91%	8.86%	26.09%	2.90%
Antananarivo Province	66.36%	10.19%	0.54%	6.58%	0.40%	2.67%	22.19%	7.19%	3.72%	11.28%	1.26%

Source: Direction de la Demographie et des Statistiques Social, 1996, Recensement General de la Population et de l'Habitat Volume

1

### (2) GDP in the Existing Plans and Projections

In order to set the GRDP growth targets in Antananarivo Agglomeration for 2023, 2028 and 2033, the following existing development plans or projections were reviewed:

- National Development Plan (PND) 2015-2019

- Programme Sectoriel Agricole, Elevage et Pêche ou PSAEP (2015)
- Document de Politique Industrielle de Madagascar (2014)

### 1) National Development Plan (PND) 2015-2019

According to PND, the growth scenario is shown in Table 5.3.7. The sectors driving the growth in Madagascar include agriculture, fisheries, mining, export processing enterprises, construction, tourism and transport (and related infrastructure).

**Table 5.3.7 National GDP Growth Scenario of National Development Plan (PND) 2015-2019**

	2015	2016	2017	2018	2019
Growth Rate	5.0%	7.0%	8.9%	10.4%	10.5%

Source: PND 2015-2019

### 2) Programme Sectoriel Agricole, Elevage et Pêche ou PSAEP (2015)

The objectives by 2025 are (i) to achieve competitive and sustainable agricultural production, leading to food security and an increase in exports, (ii) to integrate family farms and modernize processing units, and (iii) to achieve agricultural growth of 6 percent per year. There are five programmes for these objectives: rational and sustainable exploitation of the resources and production (two million ha of investment zones will be created by 2025); continuous improvement of productivity; contribution to food security; improvement of access to markets; and improvement of institutional governance.

### 3) Industrial Policy Document for Madagascar (Document de Politique Industrielle de Madagascar) 2014

The industrial policy targets that the share of industrial sector to GDP will be 25% by 2025 and labour intensive industry will be shifted to high technological industry. Additionally, the Government is in the process of updating its legislation pertaining to the mining and upstream petroleum industries to attract foreign investment. Moreover, the Government is developing new legislation on Special Economic Zones.

### 4) Other Projections

According to the World Economic Outlook Database (October, 2017) by the International Monetary Fund (IMF), projected GDP growth rate is 4.3 percent in 2017, 5.3 percent in 2018, and an average growth rate is 5.4 percent from 2019 to 2022. Furthermore, the World Bank estimated 4.5 percent in 2017, and 4.8 percent in 2018 and 2019.

## (3) Methodology of GRDP Projections

GRDP data are based on the share of GRDP to National GDP in 2014 (See Table 5.3.5). The economic framework is projected in the regional level because there are no data at the district level.

There are regional development plans for Analamanga Region. However, there are no economic indicators for development such as projected growth rate of GRDP and GRDP by economic sectors. Therefore, the share of GRDP to national GDP and the share of each economic sector in Analamanga Region, which are based on the data of INSTAT estimated in June 2018, are used as the starting point of the projections.

Moreover, most of the economic activities in Analamanga Region are focused on Antananarivo Agglomeration, which is one of the TaToM areas. Therefore, the share of Analamanga Region (41.7%) is adopted.

To set the indicators for preparing economic framework, the growth rates of GRDP for each sector in Antananarivo Agglomeration are estimated as follows:

- Primary Sector: The growth rate until 2019 is the same as the growth rate projected for Madagascar by INSTAT in Tableau de Bord Économique, Avril 2017. Beyond 2020, the



growth rate is set at 6% per year.

- **Secondary Sector:** The growth rates of the sector are based on the figures by INSTAT in Tableau de Bord Économique, Avril 2017 to 2019. Beyond 2020, the growth rate is set between 7% and 11%. Existence of several industrial zones (including plans) may be one of the driving forces that boost the secondary sector (manufacturing subsector in particular). The selected growth scenario aims Antananarivo Agglomeration to provide new export-oriented industries which can lead not only its own urban economy, but also Madagascar's national economy. This will continuously create employment opportunities for the increasing population in the agglomeration and will revitalise the urban economy. The strategies to be implemented to achieve such development are considered to establish the basis for attracting investments to Antananarivo Agglomeration.
- **Tertiary Sector:** The growth rate for tertiary sector in Antananarivo Agglomeration is set 1.5% higher than the growth rate of the tertiary sector for Madagascar. Concentration of administrative functions and existence of international airport may lead to further development of tertiary sector in particular, such as public services and logistic industry.

In addition to the above, the accumulation of population in the capital region is considered since increase in population can bring growth in all sectors.

**Table 5.3.8 Projected Growth Rates by Economic Sector for Antananarivo Agglomeration**

	Antananarivo Agglomeration				Madagascar
Period	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)	Total (%)	Total (%)
2016-2023	4.5	6.4	7.2	6.9	5.6
2024-2028	6.0	9.4	8.5	8.6	7.7
2029-2033	6.0	10.6	9.4	9.5	7.9

Source: JICA Study Team

Table 5.3.9 illustrates the future GRDP produced in Antananarivo Agglomeration as well as change of share of economic sector and growth rates by economic sector for Antananarivo Agglomeration.

**Table 5.3.9 Change of Economic Structure in Antananarivo Agglomeration**

	GRDP (MGA Billion, at 2007 constant prices)	GRDP (USD million, at 2010 constant prices)	Primary Sector (%)	Secondary Sector (%)	Tertiary Sector (%)
2014 (Actual)	7,235	4,452	4.1	19.2	76.8
2023 (Projected)	13,005	8,003	3.2	18.7	78.1
2028 (Projected)	19,626	12,078	2.8	19.4	77.8
2033 (Projected)	30,941	19,040	2.4	20.4	77.2

Table 5.3.10 shows the changes of share of GRDP for Antananarivo Agglomeration to GDP for Madagascar. The share of Antananarivo will increase from 41.7 percent in 2014 to 52.9 percent in 2033.

GDP per capita in Antananarivo Agglomeration is also expected to double in the next 15 years. (See Table 5.3.11)

**Table 5.3.10 Change of Share of GRDP for Antananarivo Agglomeration**

	Unit	2014 (Actual)	2023 (Projected)	2028 (Projected)	2033 (Projected)
Share of Antananarivo Agglomeration's GDP against Madagascar's Total GDP	%	41.7	47.0	49.1	52.9
GRDP of Antananarivo Agglomeration	MGA Billion, at 2007 constant prices	7,235	13,005	19,626	30,941
GDP of Madagascar	MGA Billion, at 2007 constant prices	17,368	27,642	39,966	58,455

Source: JICA Study Team

**Table 5.3.11 Change of GDP per Capita for Antananarivo Agglomeration**

	Unit	2014	2023	2028	2033
Population of Antananarivo Agglomeration	-	2,240,256	3,022,647	3,547,471	4,151,467
GRDP of Antananarivo Agglomeration	MGA Billion, at 2007 constant prices	7,235	13,005	19,626	30,941
	USD Million, at 2010 constant prices	4,452	8,003	12,078	19,040
GDP per Capita for Antananarivo Agglomeration	MGA, at 2007 constant prices	3,229,542	4,302,520	5,532,392	7,453,028
	USD, at 2010 constant prices	1,987	2,648	3,405	4,586
Annual Growth Rate of GDP per Capita at 2007 constant prices	-	-	3.24%	5.16%	6.14%

Source: JICA Study Team