

**THE PROJECT
FOR
COMPREHENSIVE PLANNING AND SUPPORT
FOR
URGENT DEVELOPMENT ON SOCIAL ECONOMIC
INFRASTRUCTURE
IN MALAKAL TOWN
IN THE REPUBLIC OF SOUTH SUDAN

FINAL REPORT

EXECUTIVE SUMMARY**

JULY 2014

**JAPAN INTERNATIONAL COOPERATION AGENCY
KATAHIRA & ENGINEERS INTERNATIONAL
YACHIYO ENGINEERING CO., LTD.
RECS INTERNATIONAL INC.
KOKUSAI KOGYO CO., LTD.**

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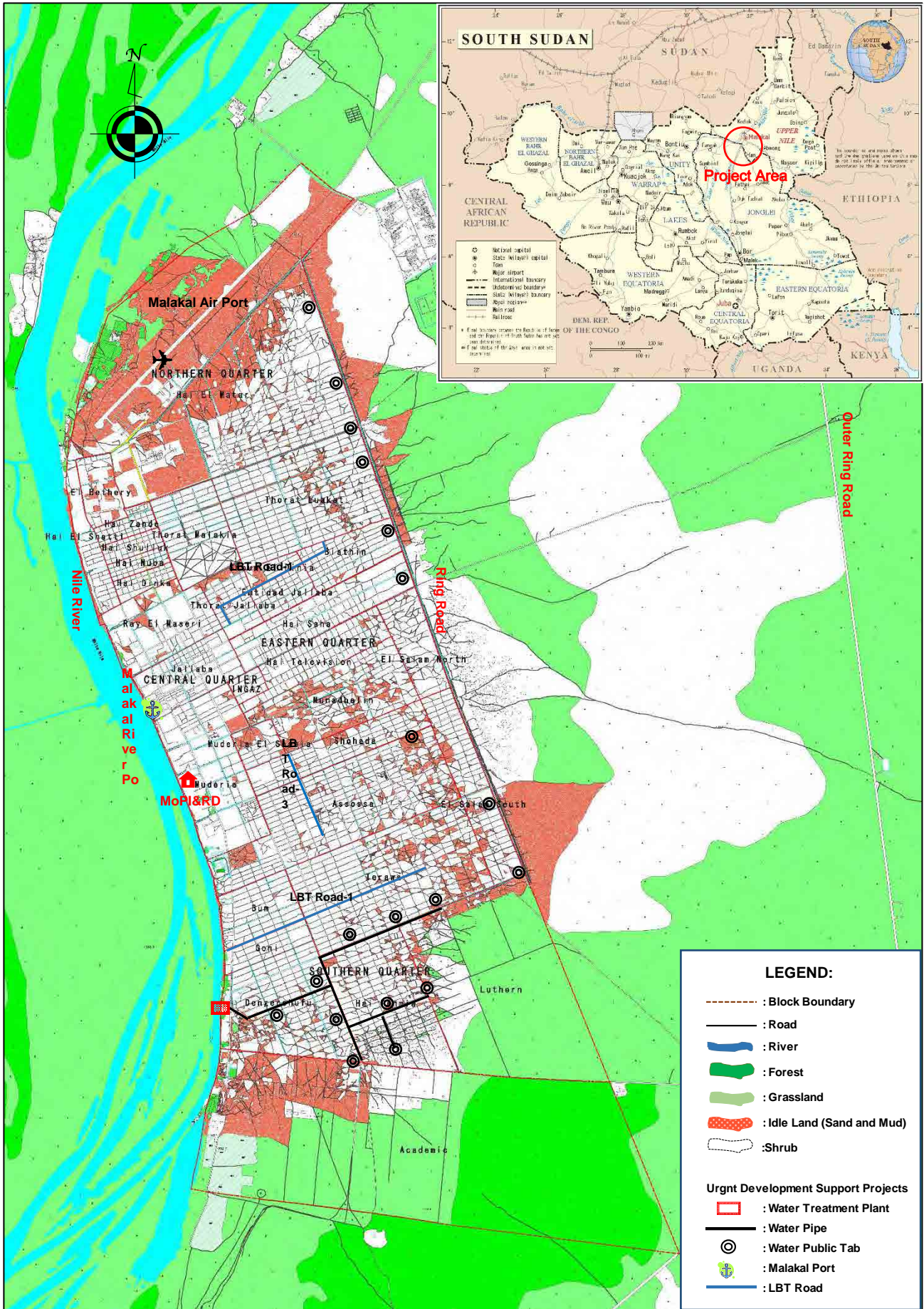
EXCHANGE RATE

August 2012

USD1 = 78.31 Japanese Yen

SSP1 = 26.544 Japanese Yen

USD1 = 2.95 South Sudan Pound



PROJECT LOCATION MAP

Photographs

Present Situation of Socio-Economic Infrastructure in Malakal Town 1



Water Treatment Plant of SSUWC
(Filter Tank)



Water pipes are deteriorated and damaged,
resulting in high ratio of non-revenue water



Malakal Port (Cargo Jetty)



Malakal Port (Passenger Jetty)



Community Road (Black and Clayey Soil
called Black Cotton Soil)



Community roads easily get muddy in rainy
season. LBT Construction Site (Upper Part)



Public Toilets at Malakal Market



Storm Water Drainage (Main Drain)

Present Situation of Socio-Economic Infrastructure in Malakal Town 2



Collection Point of Solid Waste
(Terawa Area)



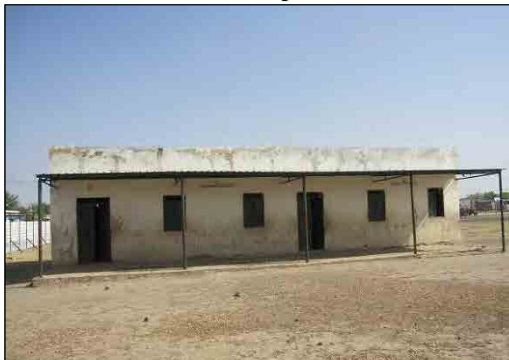
Collection Vehicle



Diesel Generator Engine of Malakal Power
Station in Operation



11kV Distribution Line



Primary School (Ordinary Type)



Junior High School (Inside)



Malakal Teaching Hospital (Inside)



Health Centre (Bum Area)

Meetings and Workshops



1st JCC Meeting in Malakal
(2012-03-13)



Malakal Workshop on Pragmatic Project
Affairs in Malakal (2012-07-23)



Seminar on Master Plan of Malakal Town
(in Juba 2013-08-26)



Seminar on Master Plan of Malakal Town
(Juba 2013-08-26) The Minister of MOLH&PP



Auto CAD Training (at MoPI&RD)



Arc GIS Training (Certificate Awarding
Ceremony at MoPI&RD)



IT Training (at MVTC)



Certificate Awarding Ceremony of IT and
English Document Trainings at MVTC

Urgent Development Project (Port)



Present Situation of Cargo Jetty Before Construction



Present Situation of Passenger Jetty Before Construction



Survey Work



Installation of Project Signboard



Loading Construction Materials at Juba River Port



Same as the Left



Ground Breaking Ceremony (2013-11-28)
CPs, VIP Guests and JICA Representatives were present.



Piling for Reinforcement of Existing Jetty

Urgent Development Project (Water Supply)



Construction Site of Water Treatment Plant Before Construction



Survey Work



Relocation of the Existing Facilities



Installation of Project Signboard



River Transportation of Construction Materials from Juba to Malakal



After Leveling of the Ground, Removal of the Facilities and Storage of the Equipemnt and Construction Materials

Urgent Development Support Project (Road)



Condition of Existing Community Roads in Malakal Town



Decreased Traffic Performance due to Mud



Construction Work by Labour Based Technology (LBT)



Laying Sandbags



Training for Roads Improvement Skills (Inspection)



Training for Roads Improvement Skills (Inspection)



Training for Roads Improvement Skills (Survey)



Lecture on Roads Improvement Skills (Survey, Inspections, etc) at JICA Malakal Compound

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List of Abbreviations

BHN	Basic Human Need
CDO	Community Development Officer
CIDA	Canadian International Development Agency
CPA	Comprehensive Peace Agreement
DEG	Diesel Engine Generator
DRB	Department of Roads and Bridges
EIA	Environmental Impact Assessment
EIRR	Economic Internal Rate of Return
ENVP	Economic Net Present Value
FIRR	Financial Internal Rate of Return
GIS	Geographic Information System
GOJ	Government of Japan
GRDP	Gross Regional Domestic Product
GSECD	General Sanitation and Environmental Corporation Department, Malakal Town
IDPs	Internally Displaced Persons
IRR	Internal Rate of Return
IT	Information Technology
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
JPT	JICA Project Team
LBT	Labour-Based Technology
LRMC	Long-Run Marginal Cost
MBT	Machine-Based Technology
MDG	Millennium Development Goal
MOE	Ministry of Environment, ROSS
MOHPP	Ministry of Housing and Physical Planning, ROSS
MVTC	Malakal Vocational Training Centre
NPV	Net Present Values
PHCC	Primary Health Care Centre
PLATUC	Public Land and Air Transport Trade Union Cooperation
PNA	Peacebuilding Needs and Impact Assessment
PPP	Public Private Partnership
ROSS	Republic of South Sudan
RoW	Right of Way
SMoE	State Ministry of Education, UNS
SMoLG&LE	State Ministry of Local Government and Law Enforcement
SMoH	State Ministry of Health, UNS
SMoPI&RD	State Ministry of Physical Infrastructure and Rural Development, UNS
SSDP	South Sudan Development Plan
SSEC	South Sudan Electricity Corporation
SSO	South Sudan Office
SSUWC	South Sudan Urban Water Corporation
SWOT	Strengths, Weaknesses, Opportunities and Threats
TA	Technical Assistance
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
UNS	Upper Nile State

Glossary of Terms

Boma:	the unit below Payam. Boma is also called Block and also loosely translated to ‘village’. In Malakal Town, the Boma chief is elected by its residents and approved by the corresponding Payam. The Boma chief is supported by Boma volunteers.
Dinka:	an ethnic group inhabiting the Bahr el Ghazal region of the Nile basin, Jonglei and parts of southern Kordufan and Upper Nile regions. Also called Jieng. The Dinka people are the largest group in South Sudan.
Greater Upper Nile Region:	the region consists of the states of Jonglei, Unity, and Upper Nile.
Malakal:	Malakal Town with its surrounding area including a new development area enclosed by an Outer Ring Road.
Malakal Town:	a city located in Upper Nile State bordering the Republic of Sudan and the Federal Democratic Republic of Ethiopia. Its area spans 3 km east to west by 8 km north to south, totalling 24 km ² .
Nuer:	the second largest ethnic group in South Sudan. They are mainly concentrated in South Sudan, with some representatives also found in south-western Ethiopia.
Outer Ring Road:	runs north–south 4 km east from the Ring Road that is the current perimeter of Malakal Town.
Payam:	the administrative unit below the county in South Sudan. In Malakal Town, six administration officers are assigned by the State Ministry of Local Government and Law Enforcement.
Ring Road:	arterial road running north–south surrounding the current eastern and southern perimeter of Malakal Town.
Shilluk:	a major ethnic group of people in Southern Sudan, living on both banks of the White Nile in the vicinity of Malakal Town. The Shilluk were historically united in a single state headed by a king. Shilluk Kingdom existed in Southern Sudan from 1490 to 1865.

<OUTLINE OF THE PROJECT>

1. INTRODUCTION

1.1 Project Background

In July 2011, the Republic of South Sudan (ROSS) achieved independence, concluding what had been Africa's longest running civil war.

Malakal Town, the target area of this Project, is located in Upper Nile State (UNS), strategically located in the international corridors bordering the Republic of Sudan to the north. The town is also well located to become an economic hub for the Greater Upper Nile Region with strong potential for economic development. Despite the signing of a Comprehensive Peace Agreement (CPA), the town has remained isolated from development support due to its geographical distance from Juba and the unstable political situation.

In this context, ROSS requested technical cooperation from the Government of Japan (GOJ) to undertake "the Project for Comprehensive Planning and Support for Urgent Development on Social Economic Infrastructure in Malakal Town in the Republic of South Sudan". In response to the request, the GOJ decided to implement the Project and the Japan International Cooperation Agency (JICA), the official agency providing GOJ bilateral aid, dispatched a Project Team. The Project commenced in February 2012.

The objective of this draft final report is to present the comprehensive plan for social economic infrastructure in Malakal Town and Urgent Development Projects conducted on the course of the Project.

1.2 Project Objectives

The Objectives of the Project are as follows:

Objectives of the Project
Project Purpose By improving social economic infrastructure in Malakal Town, local people will benefit from peace dividends, and the capacity of UNS for administrative services delivery will be enhanced.
Project Outputs
1. Development of a Comprehensive Plan for Social Economic Infrastructure Development for Malakal Town Targeting the Year 2022
2. Identification of priorities for social economic infrastructure development, and implementation of projects addressing identified urgent needs
3. Enhancement of UNS human resources to allow continuous implementation of social economic infrastructure development projects identified by the Comprehensive Plan

1.3 Project Area

The Project covers Malakal Town (3 km east to west, 8 km north to south), and its surrounding areas in Upper Nile State. Total size of the Project Area is 34 km².

1.4 Scope of the Project

(1) Formulation of the Comprehensive Plan for Malakal

- Study the present situation of Malakal Town including target sectors
- Formulate (i) a socio-economic framework for 2022, (ii) the vision for development of Malakal Town, and (iii) a comprehensive social economic infrastructure plan
- Support JICA's grant aid and technical assistance project

(2) Implementation of Urgent Development Projects

- Identify and Plan urgent development projects
- Support implementation of the urgent development projects

(3) Capacity Development

- Plan sectorial capacity development
- Plan and conduct training in Japan and third countries

1.5 Project Period

The original Project Period was from February 2012 to July 2014 as shown in **Figure 1-1**. However, the Project was terminated early in December 2013 due to an unexpected conflict that occurred in the country.

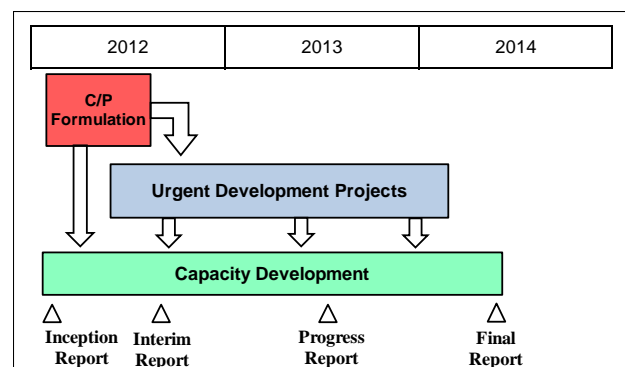


Figure 1-1 Schedule of the Project

1.6 Project Organization

Responsible Agency: Government of Upper Nile State

Implementing Agency: State Ministry of Physical

Infrastructure and Rural Development (SMoPI&RD)

Advisory Agency: Ministry of Housing and Physical Planning (MOHPP), ROSS

Project Team: 33 members

Joint Coordination Committee (JCC): UNS, ROSS, JICA South Sudan Office, JICA Project Team

1.7 Methodology of the Project

The Comprehensive Plan for Social Economic Infrastructure Development for Malakal Town Targeting the Year 2022 (herein after referred to as the Comprehensive Plan) is one of the Project Objectives and also the primary subject of this draft final report. The formulation process and the contents of the Comprehensive Plan are outlined in this section, which will serve as a guide for this report. See also **Figure 1-2**.

(1) Collection of Data and Information

The Project Team undertook a wide range of surveys of the targeted sectors in order to supplement insufficient data and information. Major surveys undertaken were a Malakal Town Profile Survey to illustrate the socio-economic situation of Malakal, and a Peacebuilding Needs and Impact Assessment (PNA) to analyse the post-conflict context. Findings of these surveys were incorporated in all procedures of aforementioned.

(2) "Vision Malakal for 2022"

"Vision Malakal for 2022" presents the approach to development for Malakal for the year 2022, namely "toward a peaceful, self-supporting, advanced and beloved city, co-existing with the Nile River". It is formulated with reference to the situation of the project target area, and in alignment with the national development plan *South Sudan Development Plan (SSDP) 2011-2013* and other relevant upper level development plans.

(3) Development Strategies

Development Strategies are identified as necessary for the actualization of "Vision Malakal for 2022":

- Malakal Infrastructure Development Strategy
- Region-wide Economic Development Strategy
- Social Development Strategy
- Peacebuilding/Governance Strengthening Strategy

(4) Frameworks

Three frameworks have been developed to provide the foundation for developing projects in each sector: (i) Socio-economic Framework, (ii) Spatial Development Framework, and (iii) Conflict Prevention Measures.

(5) Sectors under the Strategies

Each Development Strategy consists of several sectors: 1-Water Supply, 2-Water Transportation, 3-Road Transportation, 4-Energy, 5-Sewage and Sanitation, 6-Solid Waste Management, 7-Storm Water Drainage, 8-Education, 9-Health, 10-Capacity Development, 11-Economic Development, and 12-Social Welfare.

The above sectors are presented in this report in terms of (i) Present Situation, (ii) Issues and Needs, and (iii) Proposed Project to address the identified issues and needs. While Sectors 1 to 10 are sectors pre-agreed to by ROSS and JICA, Sectors 11 and 12 were added later during the course of the Project.

(6) The Comprehensive Plan

The Comprehensive Plan consists of Programmes corresponding to the Development Strategies. The Programmes are made up of the proposed projects combined in a way that maximizes development.

(7) Assessments

Assessments were conducted from two aspects in order to confirm the feasibility of the proposed project: (i) economic and financial analysis, and (ii) environmental and social considerations.

(8) Scheduling

After their formulation, the Programmes were prioritized according to the criteria prepared by the Project Team, and scheduling and budgeting were set.

(9) Urgent Development Projects

Among the proposed projects, the following three projects were selected and implemented to meet the urgent needs of the target area and act as pilots for capacity development activities in relation to Project Output 3.

- (i) Water supply improvement (Water supply sector)
- (ii) Road rehabilitation (Road transportation sector)
- (iii) Port rehabilitation (Water transportation sector)

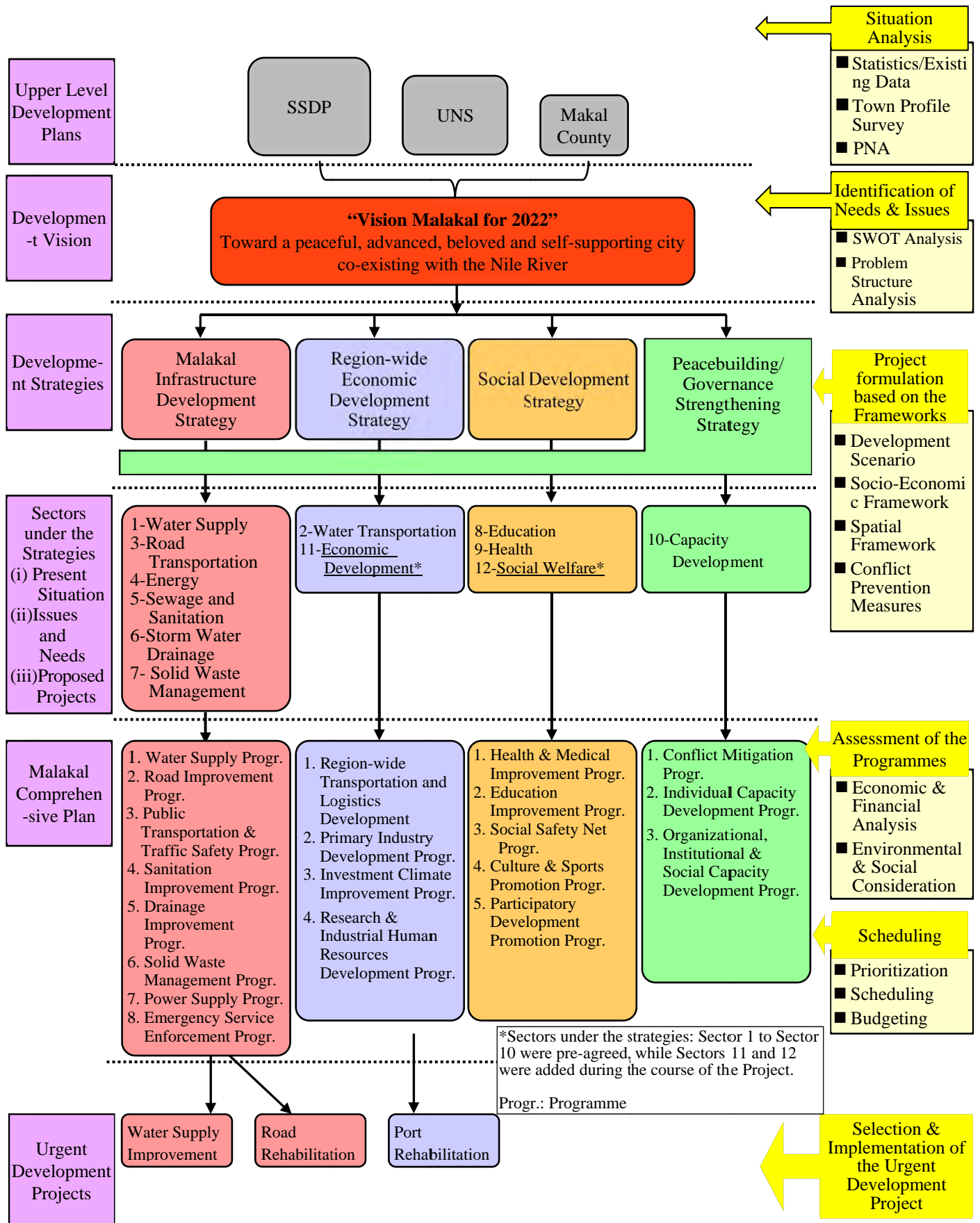


Figure 1-2 Flow of Comprehensive Plan Formulation

<PART I>
PRESENT SITUATION OF MALAKAL

Part I describes the present situation of Malakal including findings from the Malakal Town Profile Survey and PNA. All collected data and information were referred to in formulating “Vision Malakal for 2022” and Malakal Development Strategies.

2. GENERAL INFORMATION ON MALAKAL

2.1 Location

Malakal Town is located by the White Nile at a cross point of the north-south and east-west international transport routes. Malakal Town is expected to function as a hub for economic development in northern South Sudan, capitalizing on its strategic location.

2.2 Natural Condition

Malakal experiences a savannah climate with rainy seasons from June to September. The mean annual maximum temperature is 36.0 degrees Celsius, while the mean annual minimum temperature is 21.4 degrees Celsius. The topography is flat with a difference in altitude of only 3 m.

2.3 Population

Malakal has an estimated population of about 153,000 (2012), which is the second largest in South Sudan following Juba. According to the Land Use Survey carried out by the Project Team, the land area of Malakal is 34 km² (3,365 ha) with 22 Bomas, which are the smallest administrative divisions. The average population density is 63 persons per hectare, with a variation ranging from 20 persons per hectare in the southern and eastern areas, which have been rapidly urbanizing in recent years, up to 220 persons per hectare in the old urban areas.

2.4 Administration

The government system of South Sudan comprises of the following levels: national, state, and local. Local government tiers¹ consist of County, Payam and Boma. Malakal City Council was established on 5 January 2012 with jurisdiction covering three Payams (out of five Payams in Malak County), which were later divided into

¹ According to the Transitional Constitution, 2011, local government tiers shall consist of County, Payam and Boma in the rural areas, and of city, municipal and town councils in the urban areas.

four Payams. Each Payam has a Payam Office with staff officially assigned by the State Ministry of Local Government and Law Enforcement (SMoL&LE). Conversely, the Boma chief is elected by residents and supported by volunteers.

3. FINDINGS FROM MALAKAL TOWN PROFILE

The Malakal Town Profile Survey was conducted to illustrate the socio-economic situation of Malakal through five components: (i) Household Survey, (ii) Market Survey, (iii) Land Use Study, (iv) general information collection, and (iv) 1:2,500 Topographic Study.

3.1 Demography and Ethnicity

The average household size is 7.7 persons. Those claiming to be original Malakal residents are 60%, with the remaining 40% comprising returnees, Internally Displaced Persons (IDPs), ex-refugees, and refugees (Figure 3-1). Those living in Malakal for less than five years account for 44% of the total (Figure 3-2), which closely corresponds to the portion of non-original residents (see Figure 3-1). These figures reveal that nearly half of the population is new to Malakal, which implies strong needs for support for establishing livelihoods.

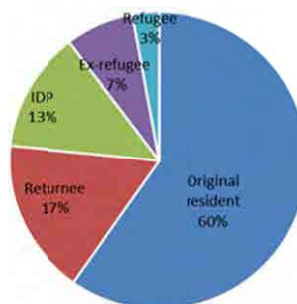


Figure 3-1 Status of Residents*

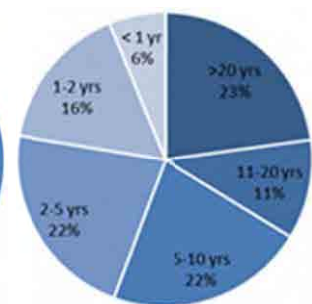


Figure 3-2 Duration of Time Living in Malakal*

A multi-ethnic society is another feature of Malakal: Shilluk 51%, Nuer 22%, Dinka 15% and others 12% (Figure 3-2).

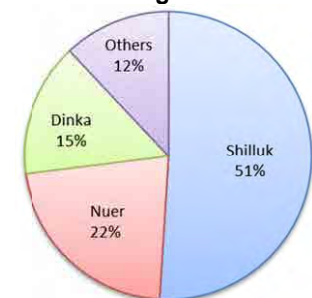


Figure 3-3 Ethnic Distribution
 * Source: JICA Project Team

3.2 Economy

The economy of Malakal is heavily dependent on public expenditure. There are no major economic activities other than retail. While there is the petroleum industry in Upper Nile State, related industries have not developed in Malakal Town. Commodity prices in Malakal are significantly higher than those in Juba due to high transportation costs. Many commodities are imported from other countries and regions, which is said to account for about 50% of commodity prices. High prices are a large burden for people and public investment. This situation indicates that development of a region-wide transportation network, through improvement of water transportation infrastructure and establishment of land transportation links to Ethiopia, is greatly needed to reduce transportation costs.

3.3 Livelihoods

Means of livelihood vary from wages and salaries to agricultural related activities. Wages and salaries are the primary means, followed by “owning a business”, and “crop farming” (Figure 3-4).

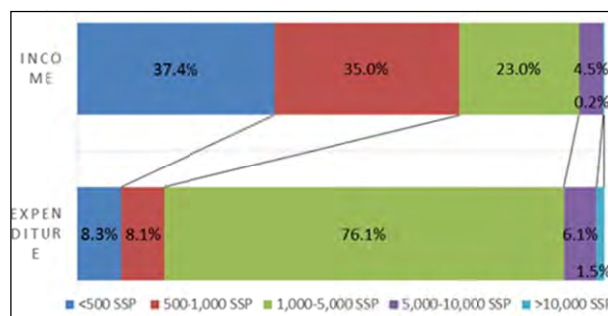


Source: JICA Project Team

Figure 3-4 Means of Livelihood

Households with a monthly income of less than 500 South Sudan Pound (SSP) are the most common accounting for 37%, followed by those with an income level of 500 to 1,000 SSP, which account for 35%. 500 SSP is equivalent to US \$22 per person per month, or 74 cents per person per day (based on 2.94 SSP/US \$1, 7.7 persons/household).

Expenditure levels are, however, higher than income levels. A monthly expenditure of 1,000-5,000 SSP per household was the most common, accounting for 76%. These data suggest that actual income is likely to be higher than what households responded, and that respondents may be underreporting their actual income.



Source: JICA Project Team

Figure 3-5 Average Monthly Income

Food, education and health are the items on which people spend the most. More than 50% of people spend more than 50% of their total expenditure on food (Engel's coefficient).

People are leading hard lives: the poverty ratio in Malakal is estimated more than 40% according to criteria of the Millennium Development Goals. As Table 3-1 shows households fall in strata of living less than US\$0.73/Person/Day account for 37.4% of the responded, about 40% of the responded.

Table 3-1 Household Income and Equivalent Income/Person/Day

(As of January 2013)

Average Income		No. of Samples	%
SSP/HH/Month	US\$/Person/Day		
<SSP 500	< US\$ 0.73	327	37.4%
SSP 500-1000	US\$ 0.73-1.47	306	35.0%
SSP 1000-5000	US\$ 1.47-7.34	201	23.0%
SSP 5000-10000	US\$ 7.34-14.67	39	4.5%
>SSP 10000	> US\$ 14.67	2	0.2%
Total		875	100.0%

Note: Monthly household income (unit SSP) is converted to individual household member/day (unit US\$)

Source: Town Profile Survey undertaken by JICA Project Team, 2013

Two thirds of households are dissatisfied with the present economic situation. Their main reasons are: not earning an adequate income to meet basic needs, high inflation rate, no job opportunities, and only just managing to cover the basic needs but nothing else.

3.4 Language and Education

Distribution of native language corresponds with the distribution of ethnicity. Shilluk is the highest, accounting for more than half. Arabic (the official language of Sudan) is spoken and written better than English (the official language of South Sudan). Such differences may relate to the location of Malakal, which borders Sudan.

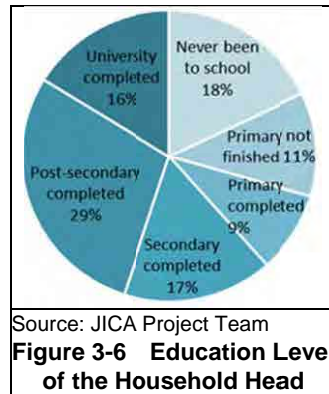


Figure 3-6 Education Level of the Household Head

Table 3-2 English and Arabic Ability

Language	Speak: Good	Write: Good
English	67.7 %	59.1 %
Arabic	91.2%	72.5%

Source: JICA Project Team

The education level of Malakal residents is relatively high²: while those who have never been to school account for 18% in total, more than two thirds completed post-secondary school and/or university. Some returnees acquired skills in their former place of residence. These people could be important resources for the economic development of Malakal and UNS. Households with youth who wish to work but are unable to find jobs account for two thirds of all respondents, which indicates the need to provide job opportunities by promoting economic development policies, for example.

3.5 Properties

Households who own their land, and who own their house account for two thirds respectively, which indicate that majority of the residents build the house on their land. The most common material for building houses is mud. The most significant difficulty in acquiring a house is the high price of housing construction materials. Two thirds of respondents have a phone, and one third has a television and/or satellite dish.

3.6 Land Use

Out of the total area of 34 km², approximately 41% of the area is used for private residential areas while 25.2% is either open space or undeveloped.

² For example, the mean for years of schooling of adults is 3.1 years in Sudan. Human Development Reports 2014, UNDP.



Source: Land Use Study by JICA Project Team

Figure 3-7 Existing Land Use

Some issues were recognised during the Land Use Study: (i) insufficient land provision for IDPs, (ii) minimal management of land use and land market (iii) inadequate control of construction activities such as informal settlement, and (iv) insufficient budget allocation to infrastructure.

Table 3-3 Major Land Use Pattern

Total Land	34 km ²
Private Residential	41%
Public Services	2%
Commerce	1%
Educational	2%
Industrial & Storage	2%
Transport (Airport & Jetty)	10%
Agriculture	2%
Open Space/ Undeveloped	25%
Road & Tracks	11%

Source: JICA Project Team

3.7 Infrastructure

Malakal had a good level of Infrastructure in the past. Infrastructure facilities, however, have deteriorated due to a lack of proper maintenance and damage caused during the civil war. Many facilities are now outdated and dilapidated.

Water supply is recognised as the most critical issue. According to the South Sudan Urban Water Corporation (SSUWC), the volume of water supplied is 1,500 m³ per

day, which is only 10% of design capacity, forcing many residents to use river water for tap water.

Water transportation has an important function in the landlocked areas, as the White Nile is a critical logistic and commercial artery for those areas. Although the Malakal Port was rehabilitated in 2003, its facilities are in poor condition due to a lack of proper maintenance. Because of limited space at the port area, appropriate jetty does not exist which forces the boat embark on the natural bank. With this situation, inadequate management of the port makes congestion of the port area worse.

The road network in Malakal is formed by major roads running north to south, sub-major roads running in an east-west direction, and community roads in a grid pattern. Since most of these roads are unpaved, they become muddy during rainy seasons, hampering smooth traffic movements.

Other infrastructure facilities are also in poor condition. See Part III for the detailed situation of the targeted sectors.

Table 3-4 Availability of Services

Road Pavement Rate(2011)	Water Supply Service Coverage(2011)	Electricity provision Rate(2012)	Net Enrolment at Primary School(2010)
0%	15%	28%	70%

Source: JICA Project Team



Photo:
JICA Project Team
Road Inundated in Rainy Season

3.8 Public Services

Among public service facilities in Boma, primary schools are the most commonly seen followed by religious buildings and medical facilities. Many people are not satisfied with the level of infrastructure and social services. The biggest difficulty people face is water, which is, therefore, the highest need as shown in **Table 3-4**.

Table 3-5 Difficulties People Encountered and Development Needs

Difficulty Encountered	(Portion)	Felt Needs	(Portion)
No water	61.4%	Water	65.3%
No electricity	20.7%	Electricity	10.2%
Flooding	9.9%	Medical facility	9.8%
No medical facilities	2.7%	Paved road	7.3%
No job/source of income	2.5%	School	5.4%
No primary school	1.1%	Police post	1.6%
No early childhood centre	0.7%	Shop	0.1%
No shelter	0.6%	Religious facilities	0.3%
No secondary school	0.2%	Others	0%
Violence in the neighbourhood/ethnic clashes	0.1%	Total	100%
Total	100%		

Source: JICA Project Team

4. FINDINGS FROM PEACE NEEDS AND IMPACT ASSESSMENT (PNA)

The Peace Needs and Impact Assessment (PNA) is an analytical tool developed by JICA to be applied in post-conflict contexts. The objectives of the PNA are three: (i) to analyse the situation of the target area from security, social, political, economic, and administrative viewpoints, (ii) to identify factors that may affect the project and vice versa, and (iii) to design JICA's intervention in a way that maximizes good and/or minimizes harm in a post-conflict situation. This section presents findings from the PNA together with those of the Household Survey,

4.1 Findings from the PNA

The PNA confirmed, as described below, that the proportion of returnees is quite high, which implies the possibility of land issues and immaturity of communities. Implementation of appropriate land management policy is needed. In the event of implementing community-oriented projects, the government should provide close support to organizing community members and effectively engage with community leaders.

4.2 Settlement

Those households living in Malakal for a period of less than five years account for 44% (see **Figure 3-2**). The places they lived previously included Upper Nile State, Khartoum, other states in South Sudan, Ethiopia, Kenya, and Sudan outside of Khartoum, and more than half lived there longer than 10 years. Almost three quarters of them have decided to stay in Malakal (**Figure 4-1**).

Among reasons for having decided to live in the present community, support from the government was the most common accounting for about 50%, followed by support from relatives at 30% (Figure 4-2).

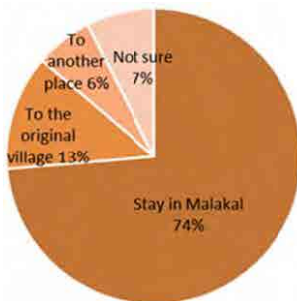


Figure 4-1 Intention to Stay or Move*

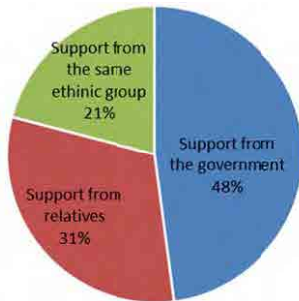


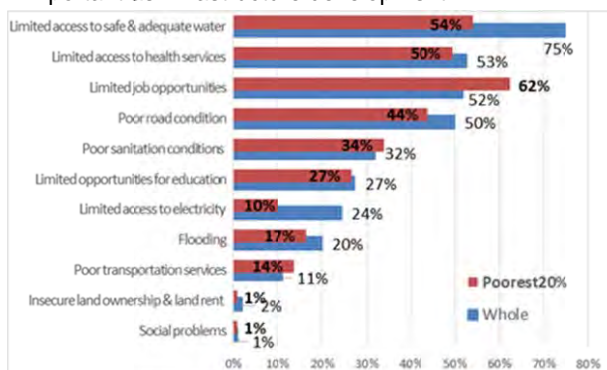
Figure 4-2 Reasons for Having Decided to Live in the Present Community*

*Source: JICA Project Team

4.3 Vulnerable People

Socially vulnerable people live in Malakal, including households headed by widows, females and children, the elderly, street children and the disabled. Female- and child-headed households account for 21% of the total respondents. This high percentage is commonly seen in post-conflict situations, and livelihoods of these households tend to be among the lowest due to the absence of male breadwinners. The poorest 20% of the population listed “limited job opportunities” as their biggest problem, which was also the third biggest problem for the whole group of respondents (Figure 4-3). As presented in Figure 3-4, wages and salaries are not major means of livelihood for the poorer respondents, with agricultural related activities remaining their dominant means.

This implies that the living environment of Malakal is extremely hard, especially for the socially vulnerable. Support for these vulnerable groups is equally as important as infrastructure development.



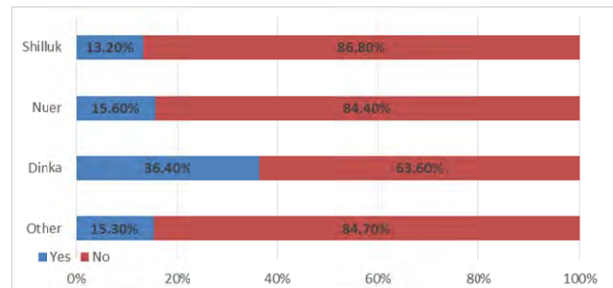
Source: JICA Project Team

Figure 4-3 Three Biggest Problems

4.4 Multi-Ethnicity

Malakal is a multi-ethnic society (see Figure 3-3). Nearly three quarters of the respondents live with different ethnic groups in their community. More than 90% of respondents do not have a conflict with other ethnic groups.

However, there are differences among the ethnic groups in terms of social problems.



Source: JICA Project Team

Figure 4-4 Social Problems Encountered by Ethnic Group

The number of respondents who have encountered social problems is high for the Dinka, which is a smaller ethnic group than the Shilluk and Nuer (see Figure 3-3). This implies that the minority groups may be more sensitive to social issues than majority groups. Due consideration is still required to provide equal opportunities and benefits to different ethnic groups during the planning and implementing of projects to avoid any possible ethnic conflicts.

4.5 Community

85% of respondents live in the community which has community leaders (Figure 4-5). Nearly 80% of leaders were elected by community members (Figure 4-6), and a combined 60% of community members see their leaders as effective (Figure 4-7). Out of the 15% of respondents who had experienced social problems, land conflict was the major cause (Figure 4-8). The most common solution for land conflict is mediation and/or settlement by authorities (Figure 4-9).

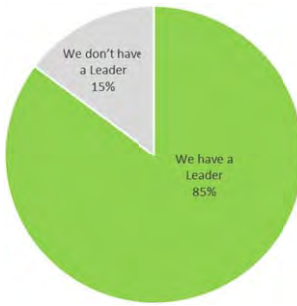


Figure 4-5 Existence of Leader in the Community*

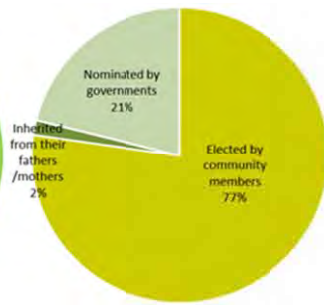


Figure 4-6 Method Leaders Took the Position*

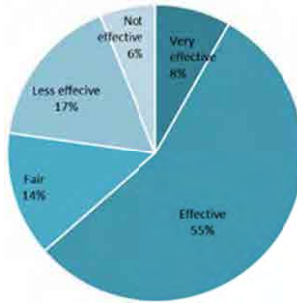


Figure 4-7 Effectiveness of Leaders*

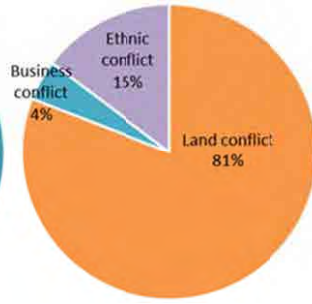


Figure 4-8 Social Problems Experienced*

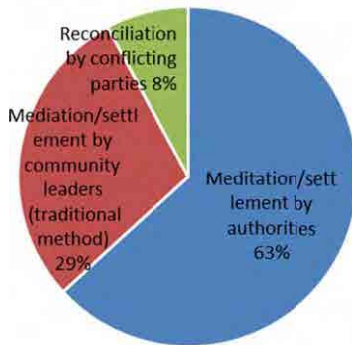


Figure 4-9 Method of Solving Land Conflict*

*Source: JICA Project Team

<PART II>
CONCEPTUAL FRAME OF THE
COMPREHENSIVE PLAN

5. “VISION MALAKAL FOR 2022” AND DEVELOPMENT STRATEGIES

In this chapter, the development vision of Malakal targeting the year 2022 and four development strategies are presented with reference to the national development plan *South Sudan Development Plan (SSDP) 2011-2013* and other relevant development plans.



Source: JICA Project Team

Figure 5-1 Hierarchy of Development Plans

5.1 South Sudan Development Plan (SSDP) 2011-2013

In order to develop a development vision for Malakal, firstly the *South Sudan Development Plan (SSDP) 2011-13* was reviewed. The SSDP defines the overall objective of development as shown below.

Overall Objective of SSDP 2011-2013

To ensure that by 2014 South Sudan is a united and peaceful new nation, building strong foundations for good governance, economic prosperity and enhanced quality of life for all.

The SSDP further states four key national development priorities, which were taken into consideration in developing the Malakal development vision.

(1) Governance

This is to build a democratic, transparent, and accountable Government, managed by a professional and committed public service, with an effective balance of power among the executive, legislative and judicial branches of government (SSDP-1).

(2) Economic Development

This is to diversify private sector-led economic growth and sustainable development that improves livelihoods and reduces poverty (SSDP-2).

(3) Social and Human Development:

This is to promote the well-being and dignity of all the people of South Sudan by progressively accelerating universal access to basic social services (SSDP-3).

(4) Conflict Prevention and Security:

This is to defend the sovereignty and territorial integrity of South Sudan, to prevent a resurgence of conflict and to uphold the constitution by providing equitable access to justice and maintaining law and order through institutions, which are transparent, accountable and respect human rights and fundamental freedoms (SSDP-4).

5.2 Upper Nile State Strategic Plan 2012/13-2014/15

In the *Upper Nile State Strategic Plan 2012/13-2014/15* prepared by UNS, the following state vision is articulated.

UNS State Vision

To be a Beacon of Peace, Democracy, Transparency, Accountability, Equity, and Prosperity in South Sudan

Four pillars are established to reach the state vision: governance, economic development, social and human development, and conflict prevention and security. These are in close parallel with those of the SSDP.

5.3 Makal County Strategic Plan 2012-2014

Makal County Strategic Plan was formulated based on the results of consultation meetings at several layers of local administration with support from UNDP and Canadian International Development Agency (CIDA). The Plan stated the County vision, as follows, along with development goals and objectives.

Vision of Makal County

A Secure and Developed County by 2012-2014

5.4 Process to formulate “Vision Malakal for 2022”

(1) Problem Structure Analysis

The JICA Project team and SMoPI&RD conducted the problem structure analysis to identify problems, their mutual relations and major issues.

The following issues were covered: poor living

conditions, inadequate provision of public services, poor condition of infrastructure, limited government capacity, rapid population increase, an influx of returnees, disorganized urbanization, low incomes, price rises, the long-lasting war, a weak legal base and enforcement mechanism, traditional values, negative behaviours, and weak security.

Vision Malakal for 2022
Toward a peaceful, advanced, beloved and self-supporting city co-existing with the Nile River

(2) Workshops for formulating Vision Malakal

A series of workshops were held with SMOPI&RD to compile ideas on how Malakal would like to be by the year 2022. Various ideas were expressed, which are summarised as follows:

- To have a peaceful beloved city
- To see Malakal Town as the most developed city in South Sudan

The following issues were recognised as needing to be addressed: security, public services, capacity of staff, management, financial resources, strategy and planning, operation and maintenance, and community participation.

(3) SWOT Analysis

With reference to the SWOT analysis presented in the *Makal County Strategic Plan* and the results of the above workshops, the Project Team conducted a SWOT analysis on Malakal.

Table 5-1 Malakal SWOT Analysis

<p>Strengths</p> <ul style="list-style-type: none"> • Densely inhabited population • Revenues • Fertile land • State capital • Upper Nile University 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Sluggish industrial activities • Insecurity • Unpaved roads • Poor infrastructure • Shortage of health personnel
<p>Opportunities</p> <ul style="list-style-type: none"> • Nile River • Geographical location (access to the East African countries) • Existence of organizations in the county • Existence of oilfield and mineral resources in the nearby area • Existence of solar energy 	<p>Threats</p> <ul style="list-style-type: none"> • Floods • Unreliable logistics • Unhealthy environment

Source: JICA Project Team

(4) “Vision Malakal for 2022”

Based on the SSDP, the *UNS Strategic Plan*, the SWOT analysis, and views of officials from the UNS government and Malakal municipality, "Vision Malakal

for 2022” was formulated with facilitation from the JICA Project Team.

The vision for Malakal development targeting the year 2022 is defined as follows.

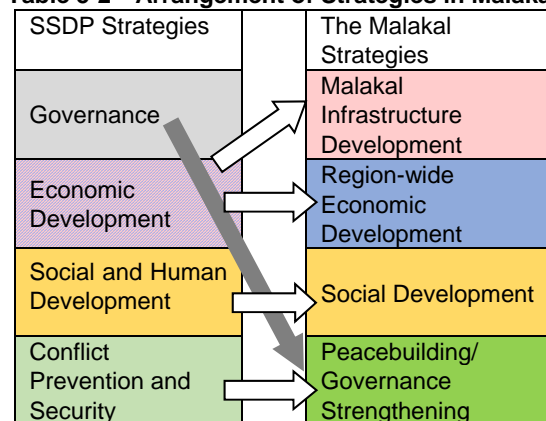
5.5 Malakal Development Strategies

"Vision Malakal for 2022" has development strategies to actualise the vision, which are referred to as Malakal Development Strategies. The following four strategies were identified as the Malakal Development Strategies with reference to those of the SSDP.

- (i) Malakal Infrastructure Development
- (ii) Region-wide Economic Development
- (iii) Social Development
- (iv) Peacebuilding/Governance Strengthening

However, the Malakal Development Strategies do not directly align with those of the SSDP. While the SSDP’s “Governance” and “Conflict Prevention and Security” are merged in “Peacebuilding/Governance Strengthening” in the Malakal Strategies, the SSDP’s “Economic Development” is broken down into “Malakal Infrastructure Development” and “Region-wide Economic Development” in the Malakal Strategies. This arrangement was created to better respond to the context of Malakal in consideration of its location and its historical and geographical characteristics.

Table 5-2 Arrangement of Strategies in Malakal



Source: JICA Project Team

(1) Malakal Infrastructure Development Strategy

The major objective of the Project is the improvement of infrastructure for the betterment of living conditions in Malakal. The following are strategies for Malakal Infrastructure Development formulated based on the current situation of infrastructure and availability of public services, and needs of the residents. Malakal

Infrastructure Development Strategies cover several sectors. It is expected that infrastructure development is carried out by the government through designated ministries.

- a) Basic human needs (BHN) of the residents will be fulfilled from the need with the highest priority based on a needs assessment.
- b) Housing development for returnees will be accelerated through consolidation of land ownership and land use measures in consideration of the large number of returnees in Malakal.
- c) Urban infrastructure to support productive activities will be developed at an appropriate time in accordance with the economic development strategy described below.

(2) Region-wide Economic Development Strategy

The Region-wide Economic Development Strategy was drawn up in consideration of the strategic location of Malakal, which will serve as a hub for UNS.

- a) The economic development of Malakal needs to be planned and implemented in consideration of its strategic location in a region-wide context. A regional economic community could be organised, in which Malakal serves as the hub, with the rest of UNS, or even in the larger context of the Greater Upper Nile region (Jonglei State, Unity State and UNS) or with neighbouring countries such as Ethiopia. Malakal will function as a base for supplying goods and services and processing commodities for the surrounding areas. The surrounding areas will act as a production area of raw materials from primal industries such as agriculture, fisheries and livestock.
- b) A region-wide transportation network needs to be established for the above described mutually supportive mechanism. The initial emphasis will be on the development of a region-wide water transportation system to reduce transportation costs.
- c) The economic structure of Malakal needs to be transformed from the current structure, which is heavily dependent on public expenditure, to a more autonomous one based on the continuously expanding equilibrium of supply and demand. This transformation needs to be pursued in a step-by-step manner: the government will play a major role at the initial stage while the private sector will play a minor role, but will gradually take on a significant role thus

reducing dependency on public expenditure.

- d) Petroleum related industries will be promoted in Malakal to take advantage of oil production in UNS.

(3) Social Development Strategy

Social development is expected to support the physical, social, cultural and spiritual development of the residents. The following are the social development strategies:

- a) The quality and management of health and education services will be improved so that residents can have better access to these services and receive higher quality services.
- b) Malakal Town will be the regional centre of high-quality medical and educational services in Greater Upper Nile Region.
- c) Social development of Malakal will incorporate a model of social safety nets, community participation and social cohesion through cultural and sporting activities.

(4) Peacebuilding/governance strengthening

Without proper governance, peace cannot last, and development activities cannot be implemented. Thus peacebuilding and governance are inextricably associated with each other and are cross-cutting themes essential in effectively implementing the three strategies and in improving the quality of life of residents. This strategy requires capacity development of the concerned parties as follows:

- a) Peacebuilding and governance should be recognized as cross-cutting subjects related to all aspects of development.
- b) Due attention should be paid to conflict mitigation and prevention in project planning and implementation, and to the promotion of ethnic harmonization through collaborative works aiming at a common target.
- c) Capacity development should be pursued at three levels: individual, organizational, and whole of society. This "individual" refers to government officials, while organizations need to strengthen project management capacity. Legal systems and social mechanisms that enable communities to participate in issues related the civilian life is necessary for the development of Malakal.
- d) Human resource development and education

expansion should be promoted to improve skill levels of youth in order to accelerate the economic development of Malakal and improvement of resident livelihoods.

rates of 40%, 20% and 0% were estimated respectively for the high, medium and low cases. The medium growth case was adopted.

5.6 Framework for Development Strategies

This section presents frameworks that were considered when developing the Comprehensive Plan: (i) Development Scenario, (ii) Socio-economic Framework, (iii) Spatial Framework and (iv) Conflict Prevention Measures.

(1) Development Scenario

Prior to preparing frameworks, particularly the socio-economic framework and spatial framework, two development scenarios were formulated with consideration to the following:

- The Comprehensive Plan consists of rehabilitation/reconstruction projects.
- The planning horizon is 10 years.
- The Comprehensive Plan should be formulated and implemented immediately.

The two development scenarios are:

A Recovery/reconstruction oriented type

B Recovery/reconstruction and development type

With consideration to the time required for each scenario, Scenario B "Restoration/Reconstruction and Development Type" was adopted.

(2) Socio-economic Framework

A socio-economic framework was prepared for the population and gross regional domestic product (GRDP).

The population of Malakal was projected for the year 2022 and preceding years, through which demand for various urban and social services could be estimated and reflected in designing facilities. The factors considered in projecting the 2022 population were natural increase, trend of returnees, and social increase caused by factors other than returnees. The future population of Malakal Town was projected as a range from high growth and low growth. The medium case is considered as the most likely. GRDP was projected to set a target for production increases. Three cases of low, medium and high growth were assumed with the unemployment rate as the main indicator. Three levels of economic growth that would cause unemployment

Table 5-3 Socio-economic Framework

Item	Unit	2012	2022*
Population	thousand	153	240
Population average increase (2012-2022)	%/year	4.6	
GRDP	Mil. SSP	473	1,131
GRDP average increase (2012-2022)	%/year	9.1	
GRDP per capita**	SSP	3,094	4,706
	US\$	1,049	1,595
GRDP per capita average increase (2012-2022)	%/year	2.1	
Unemployment	%	40	20

*Date of 2022 based on the medium growth scenario **1 US\$=2.95 SSP

Note: GDP per capita of South Sudan was US \$1,546 in 2011.

Source: JICA Project Team

(3) Spatial Framework

Firstly, principles for the framework were laid down in an appropriate manner to respond development of Malakal (Table 5-4). These principles were applied to the development plans of urban infrastructure item (see Chapter 6 for details)

Table 5-4 Principles for the Urban Structure Plan

- a. Development of urban area with industrial accumulation around the Malakal Port
- b. Alignment of urban roads in a grid pattern
- c. Location of the major urban functions along the Nile River
- d. Formation of a new industrial area in the area close to Malakal Airport, Port (Ogot), the Outer Ring Road and Ring Road
- e. Formation of a new urban area in the east of the Ring Road and southern area
- f. Development of the Outer Ring Road, Ring Road and the new residential area between them as important components of Malakal Town
- g. Securing of park areas in the river bank and other areas
- h. Establishment of relations with the opposite side of Nile River

Table 5-5 Principles for Land Use Zoning

- a. Emphasis on refinement of land uses to ensure effective urban functions and enhance the urban environment
- b. Allowing for mixed land uses for rational land use conversion in the process of evolution of Malakal Town
- c. Emphasis on allocating urban functions matched to the characteristics of the area and in consideration of affordability of land prices
- d. Consideration of the existing land use and urbanization
- e. Conversion of land use in line with affordability of land prices
- f. "Upper Nile State Physical Planning and Development Regulation" as the main reference source for land use zoning

The spatial development framework was prepared in the form of urban structure plan (Figure 5-2) and land use plan (Figure 5-3).

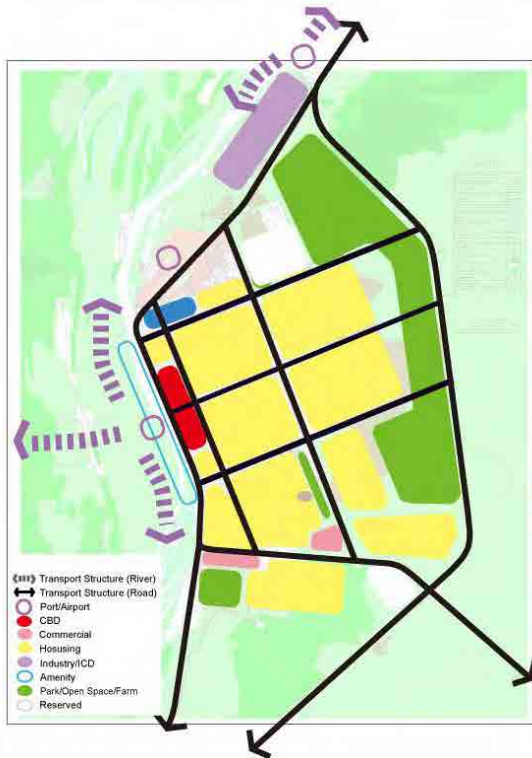


Figure 5-2 Urban Structure of Malakal Town in 2022*

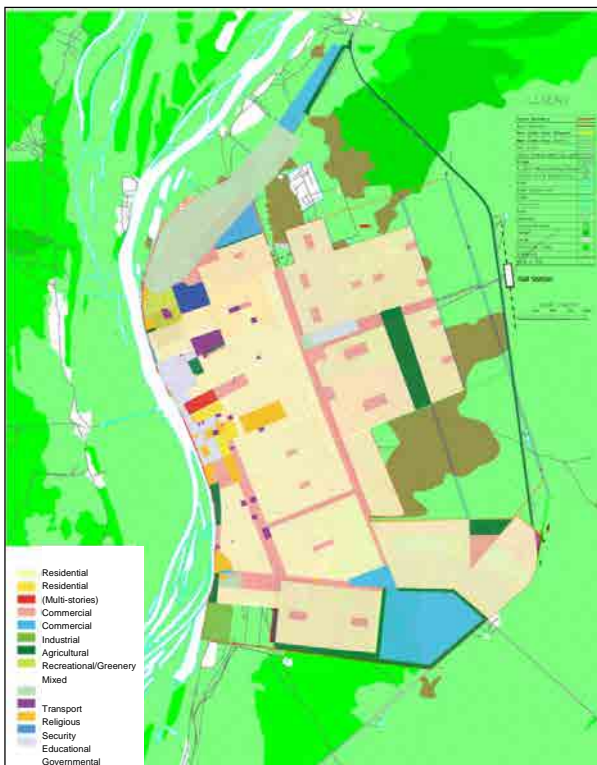


Figure 5-3 Land Use Zoning of Malakal Town in 2022*

* Source: JICA Project Team

(4) Conflict Prevention Measures

This section presents issues that should be considered

in designing and implementing development projects in Malakal, particularly in terms of the development strategies.

(i) Malakal Infrastructure Development

Infrastructure Urban infrastructure development should place high priority on responding to basic human needs (BHN). Unfulfilled BHN, such as water, will sow seeds of discontent towards the government, which may create social instability. Attention should be paid to Bomas with a high ratio of returnees and immigrants.

(ii) Region-wide Economic Development Plan

Enhancement of Livelihoods Consideration should be paid when employing people to youth, socially vulnerable people and returnees. The need for job opportunities is quite high among these groups.

(iii) Social Development

Social Cohesion Different ethnic groups coexist in Malakal. It will be necessary to make efforts to strengthen communities and promote coexistence among ethnic groups.

(iv) Peacebuilding/governance strengthening

Ownership and Utilization of Land Since land issues are a major cause of disputes, the following measures are recommended:

- Introduction of statutory law for land management
- Streamlining of land ownership and management of public land
- Formalization of procedures for land distribution
- Differentiation of urban land planning and land expropriation

(5) Long-term Perspectives for Urban Development Planning - SEARNS

The JICA Project Team proposes a concept called "SEARNS" to integrate advanced views of urban development into the vision.

- | |
|---|
| <p>S: Symbiotic System (coexistence of culture and people with nature)</p> <p>E: Ecological System (preservation of ecology)</p> <p>A: Amenity Oriented (integrating amenity into urban planning)</p> <p>R: Recycling System (recycling of resources)</p> <p>N: Network System (networking with other areas/people in various ways)</p> <p>S: Self-supportive System (strong and stable economic, social and city service base)</p> |
|---|

<PART III>
SECTORS UNDER THE STRATEGIES

In this PART (Chapter 6), three components are presented for the target sectors: (i) present condition and situation, (ii) needs and issues, and (iii) plans and (iv) proposed project to address the identified needs and issues of the targeted sector. See below list for the target sectors.

6.1	Water Supply
6.2	Water Transport
6.3	Road Transportation
6.4	Energy
6.5	Sewage and Sanitation
6.6	Storm Water Drainage
6.7	Solid Waste Management
6.8	Education
6.9	Health
6.10	Capacity Development
6.11	Economic Development
6.12	Social Welfare

6. SECTOR ANALYSIS AND PROPOSED PROJECTS

6.1 Water Supply

(1) Present Situation

The SSUWC was established in 2007 with responsibility for the provision of water services in urban areas, to improve their sustainability and to expand the service coverage. The headquarters of the SSUWC is located in Juba. Water supply in Malakal Town has been served by SSUWC-Malakal, a branch office of the SSUWC, since 2007.

Water sources are categorized as per the following:

- 1) Supplied by the SSUWC through water pipes with a flat rate, depending on the diameter of water pipe: SSP26/month for 25mm or SSP15/month for 19mm.
- 2) Supplied by an NGO at its treatment plant
- 3) Sold by vendors in either purified or non-purified form 15 SSP for a drum can (200 litres) 75 SSP /m³
- 4) Taken directly from Nile River without treatment.

The water supply service of SSUWC-Malakal, UNS, is summarized in **Table 6-1**.

Table 6-2 shows an outline of the existing water supply facilities managed by SSUWC-Malakal. In 2013, only 1,500 m³/day was produced because of fuel shortages. About 52 km of the existing pipes were laid in 1937 and are now in an advanced stage of dilapidation.

Table 6-1 Summary of Water Supply Service of SSUWC-Malakal

(As of August 2013)

No.	Item	Unit	Data
1	Population (2012)		153,000
2	Service Population (2013)		20,505
3	Water Service Ratio	%	13.4
4	Number of Service Connections		2,663
5	Number of Installed Water Meters	meters	0
6	Water Production	m ³ /d	1,500
7	Revenue Water	m ³ /d	300
8	Revenue Water Ratio	%	20
9	Non-Revenue Water Ratio	%	80

Source: JICA Project Team and SSUWC-Malakal

Table 6-2 Water Supply Facility of SSUWC-Malakal

(As of August 2013)

Item	Specification
Design Capacity	14,800 m ³ /day (24 hrs.) • Chemical clarification & filtration: 10,800 m ³ /day • Ultra-filtration: 4,000 m ³ /day
Water Production	About 1,500 m ³ /day(3 hrs. operation) (About 10% of design capacity)
Purified Water Reservoir	2 reservoirs (Of two, one tank capacity is 256 m ³)
Transmission System	4 system lines
Main Pipelines (Diameter: at least 100 mm)	Deteriorated pipes: 52 km Replaced pipes (2009): 92 km
Elevated Tank	About 25 m ³ x 3 tanks
Water Points (Public Taps)	6 points x 11 faucets (only along Ring Road)

Source: SSUWC-Malakal

The location of existing pipes is shown in **Figure 6-1**. There is a shortage of capacity in the purified water reservoir and transmission pump. Sand filtration is also failing.

Consumers were not satisfied with the water supply service due to the failure to provide a stable service. Consumers subsequently vandalized pipes, resulting in suspension of operations for part of the water supply facilities. Moreover, the pipelines were damaged by road construction further aggravating the water outage.

SSUWC-Malakal acknowledges responsibility for the damage to pipes caused by road construction. SSUWC-Malakal could not provide the road contractor with the necessary information such as drawings and an inventory of existing pipelines. Hence, SSUWC-Malakal could not ask the road contractor for compensation for the damaged pipes. However, SSUWC-Malakal is unable to bear the repair costs (about US \$400,000) of the damaged pipes because of budget constraints.

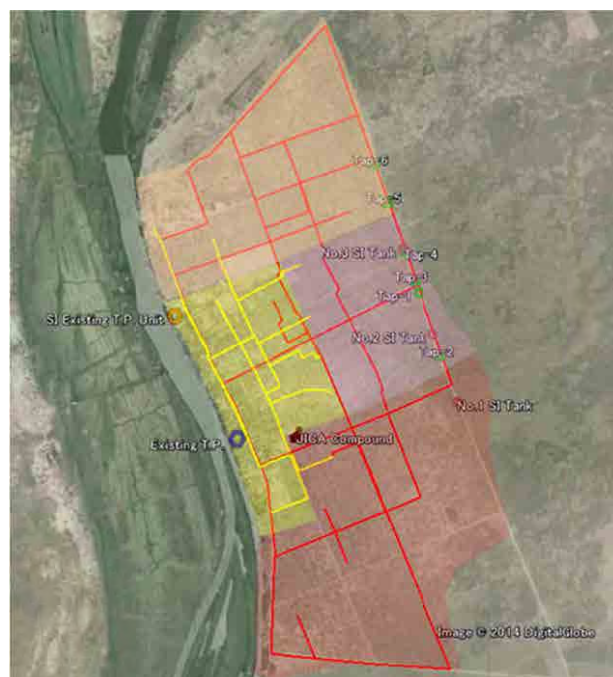


Figure 6-1 Current Condition of SSUWC Water Supply Services

(2) Water Supply Sector Issues

The share of water users of the public water supply system is currently about 17% of the total population in Malakal Town. In order to improve water supply services in Malakal Town, the following issues should be responded firstly:

- Supply safe and stable water services
- Supply water to areas without water service
- Eliminate low water pressure areas
- Raise water revenue ratio
- Realization of a ring-fenced finance system

The actual performance of the existing purification treatment has been lacking. Therefore, supply of water to whole area and performance recovery of the existing water supply facilities are urgent issues.

(3) Water Supply Plan

SSUWC-Malakal focuses on the following goals for the future water coverage rate:

- The first goal is to raise the water service coverage ratio from 17% to 100% by the year 2022 throughout Malakal Town.

Development plans for water supply facilities have been identified as follows:

- The existing treatment plant will be prioritized for restoration to increase design capacity to 15,000m³/day.
- Deteriorated distribution pipelines that were laid in the 1930s are to be replaced.
- Pipelines may be extended in the new urban areas.

Water supply can be categorized into three service types: house connections, public taps and water trucks. These mechanisms should be selected in consideration of the followings: existing condition of water supply services, willingness to pay, capacity to pay, current expenditure for water, cost effectiveness, and operating and maintenance (O&M) costs. O&M costs for water supply services must be covered by the collected water tariff such as through a ring-fenced finance system (self-finance system).

The estimated water demand and target water service by year are shown in **Table 6-3**.

Table 6-3 Estimated Water Demand and Service Target

	2012	2014	2018	2020	2022	
Water Coverage of Domestic Water by Water Source (%)	13	13	13	5	5	House Connection
	87	87	87	95	95	Others
Daily Water Consumption Rate (l/pers./day)	50	50	50	70	70	House Connection
	20	20	20	30	30	Others
Water Consumption Factor other than home-use	9% of Total Water Demand for Residential Consumption					
Non-Revenue Water for House Connection (%)	80	80	80	15	15	
Non-Revenue Water for Others (%)	0	0	0	15	15	
Daily Max. Water Demand	120% of Water Demand					

Source: JICA Project Team

(4) Proposed Water Supply Projects

- WS-1 Small-scale Water Supply Development Project
- WS-2 Rehabilitation Project of the Treatment Plant and Distribution Pipe Network
- WS-3 Technical Cooperation Project on Improvement of Water Supply Service
- WS-4 Expansion of the Treatment Plant and Distribution Pipe Network Project

See **Table 10-1** for the outline of the proposed projects.

6.2 Water Transport

(1) Present Situation

Management system of Malakal Port is three lines: by ROSS, by UNS, and by the military. Although Malakal Port facilities were transferred from ROSS to UNS at the conclusion of the CPA in 2005, some facilities are still managed by ROSS. In terms of port operations, ROSS manages barges, UNS manages small boats, and the military manages port security and access control of ships.

Malakal Port is located in Central Payam (Quarter), Malakal Town. The location is shown in the Project Location Map, and the layout is shown in **Figure 6-2**.

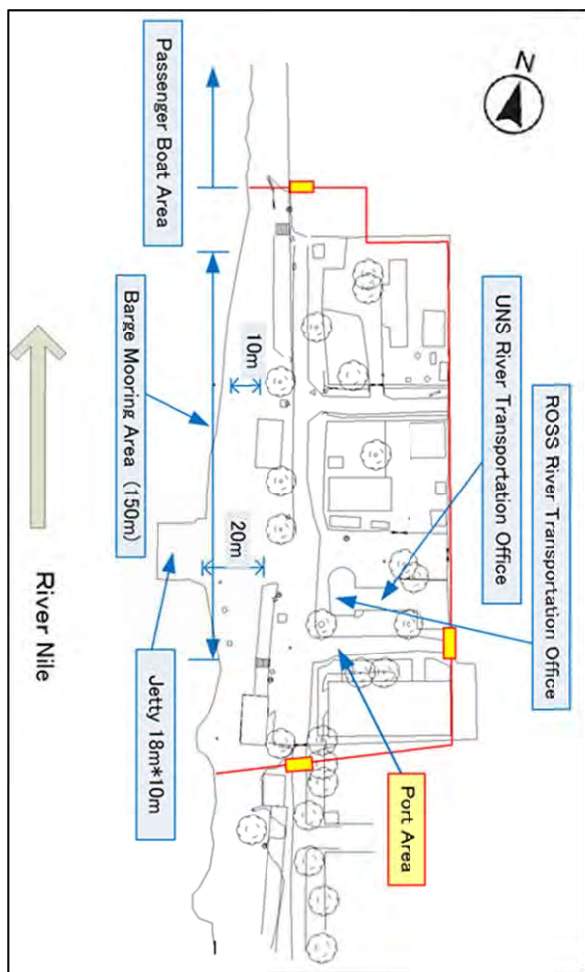


Figure 6-2 Layout of Malakal Port

The port area is very narrow. The length of the berthing space for barges is about 150 m. The width of the apron is around 10-20 m, and there is no space behind for freight handling. There is no space for cargo trucks to manoeuvre, and they have to perform 3 point turns.

The slope protection uses stone pitching, but it has collapsed, and stones are scattered due to degradation

from age.

There is a steel 18 m x 10 m jetty that was constructed in 2003, but it has not been maintained and uncontrolled berthing has rendered it unusable. In addition, there is only one mooring space, and there is no water supply system for ships. The warehouse of the United Nations Mission in South Sudan (UNMISS), a hall, a guesthouse, and ROSS and UNS's offices are located in the port area.

Table 6-4 Outline of Malakal Port Facilities

Item	Details	Specification
Length		150 m
Width		10-20 m (apron)
Water Depth		4-6 m
Facilities	Jetty	10 m x 18 m
	Warehouse	3 units (1 unit managed by UNMISS)
	Guest House	1 unit
	Office	2 units
	Hall	1 unit
	Loading Equipment	none
Cargo Handling	Incoming	daily commodities, fuel
	Outgoing	almost none
Road	Access Road	Broken paved road of 10 m width and 100 m length from the main street
	Port Road	Very narrow; cars cannot pass

Source: Field Survey of JICA Project Team

Categories of Ships The categories of ships incoming in Malakal Town are as follows: 1) Barge, 2) Speed Boat, 3) Passenger Boat, 4) Fishing Boat, and 5) Ferry Boat. According to the results of the boat passengers' O/D (origin/destination) survey conducted by the JICA Project Team, most passengers use boats for the purpose of commuting to work or school and for personal and company business.

Table 6-5 Average Number of Fleets of Barges per Month Calling at Malakal Port (between January and June 2012)

No. of Fleets	No. of Barges	Weight of Cargo (ton)	Average Stay (day)
4	12	1468	5.5

Source: JICA Project Team

(2) River Transport Sector Issues

The river port in Malakal Town not only plays an important role for local transportation within Malakal Town vicinities but is also part of a broad hinterland as a dominant river port for UNS and the northern part of South Sudan. Identified issues are as follows:

- Port Improvement for Cargo Transport

Rehabilitation of the present port is an urgent issue not only to stabilize commodity price, but also to transport goods including construction equipment necessary for recovery and reconstruction. Construction of the new port will be a possible solution considering future industrial development and containerization.

- Port Improvement for Passenger Transport

It is necessary to construct passenger platforms at the current passenger boarding area adjacent to the market and town centre to create a safe and public transport network. Construction of the ferry facility to accommodate larger ferry boats and procurement of such boats to transport a growing number of passengers and their commodities will become issues for consideration in the near future.

- Fish Port Improvement

It will be more effective to consider fish port improvement and fishery development in an integrated manner.

- Capacity Development of Port Management

The following issues shall be responded to operate the new port as an international port: port operation and management know-how, safety measures for navigation including procurement of port radios and human resource development of pilots, a database of statistical port data, enhancement of the organization and CIQ (Customs, Immigration and Quarantine).

(3) River Transport Plan

To deal with the pressing issue of coping with increasing cargo and passenger transport demand, port restoration may be an imminent measure. Public transport and access roads to the port are also to be improved along with restoration or reconstruction of the present Malakal Port. Port facilities on the opposite bank (western bank) and ferry boats are also to be improved.

In the medium and long term, however, port development is to be undertaken based on economic development and the future urban structure. In this regard, the present Malakal Port has a limited scope for expansion. Therefore, another site suitable for the new port is to be sought.

Development of navigable routes to ensure safe navigation are to be formulated without delay. Capacity development of port related personnel is also to be promptly undertaken, with the expectation of creating synergies with existing technical cooperation projects.



Figure 6-3 Candidate Site of New Malakal Port

(4) Proposed Port Projects

- PT-1 Reconstruction of Jetty at Malakal Port Project
- PT-2 Procurement of Crane Project
- PT-3 Construction of New Port Project (Phase 1)
- PT-4 Construction of New Port Project (Phase 2)
- PT-5 Construction of Passenger Jetty Project
- PT-6 Development of West Side (Left Bank) of River Nile Project
- PT-7 Improvement of Malakal Port Project
- PT-8 Procurement of Ferry Project
- PT-9 Improvement of River Bank Protection Project
- PT-10 Improvement of New Port Road Project
- PT-11 Port Management Capacity Development Project

See **Table 10-1** for the outline of the proposed projects.

6.3 Road Transportation

(1) Present Situation

Table 6-6 shows agencies involved in the Road Transport Sector in UNS. Before ROSS achieved independence, the SMOPI&RD was responsible for rehabilitation and reconstruction of economic and social infrastructure in UNS, which had been battered by a long civil conflict.

Table 6-6 Organizations and Major Activities involved in the Road Transport Sector, UNS

Organization/Major Activities	
1	Department of Roads and Bridges, Directorate of Roads and Transport, SMOPI&RD <ul style="list-style-type: none"> • Establishment and management of master plan • Planning of transport system • Planning of road network in UNS (connection of Malakal with county capitals) • Construction and maintenance of roads, bridges and public buildings • Improvement of walkways and lanes for non-motorized transport (NMT)
2	Department of Road Transport Safety, Directorate of Roads and Transport, SMOPI&RD <ul style="list-style-type: none"> • Management of registration for government vehicles • Enforcement of road transport safety regulations³
3	Directorate of Physical and Urban Planning, SMOPI&RD <ul style="list-style-type: none"> • Management and administration of urban planning and zoning
4	Traffic Police <ul style="list-style-type: none"> • Vehicle registration and vehicle inspection (except government vehicles) • Issuance of driving licenses • Traffic control • Investigation of traffic accidents
5	Feeder Road Technical Committee, ROSS <ul style="list-style-type: none"> • Fund finding support • Funding

Source: SMOPI&RD, UNS

Figure 6-4 shows the existing road network system in Malakal Town. The road network in Malakal Town forms a grid consisting of major roads and minor (sub-major) roads. The local and community road network also forms a grid inside the major road network. The surface of most roads in the town is unpaved, and many of the roads become impassable during the rainy season.

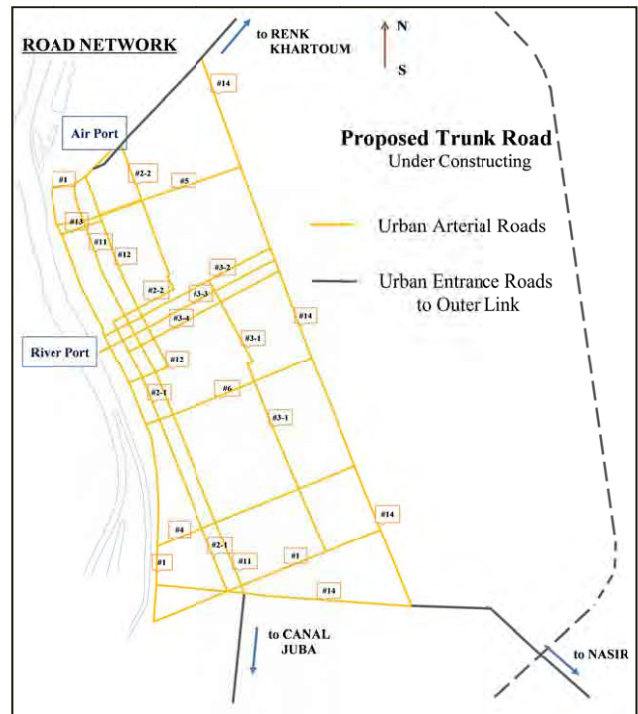


Figure 6-4 Road Network in Malakal Town

Public Transportation. Auto rickshaws (tri-wheelers), small cars, sedans and minivans are used as public transport vehicles in Malakal. Sedans, minivans, minibuses and large buses are used for the connection between Malakal Town and other towns. These vehicles are operated as private taxis or public buses in Malakal Town. Bus routes are selected by the Public Land and Air Transport Trade Union Cooperation (PLATUC).



Photos of Public Transport Vehicles Used in Malakal Town

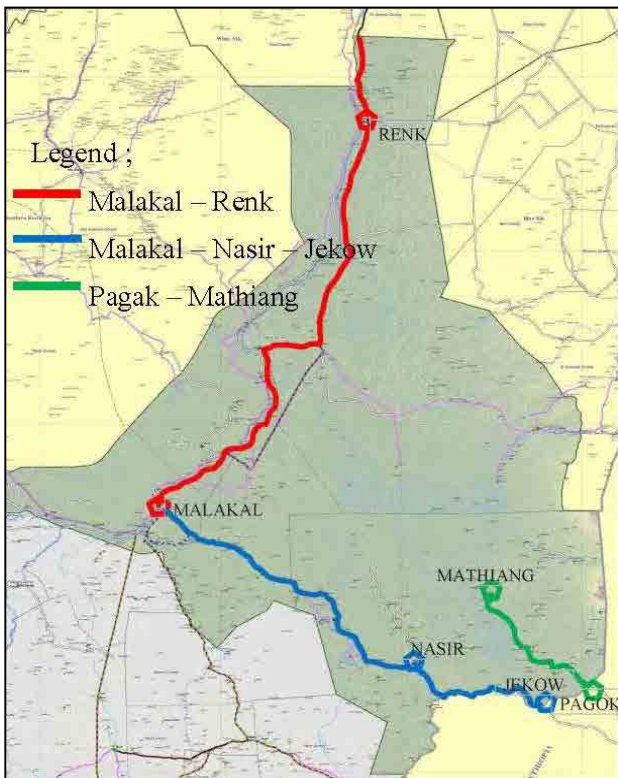
Proposed and ongoing roads projects in UNS are summarized in Table 6-7. The location of the three principal projects is indicated in Figure 6-5.

³ The present work of this department is only the management of government vehicles.

Table 6-7 Road Sector Projects

	Project	Finance	Contractor	Progress Situation
1	Malakal – Renk Road	GONU		
2	Malakal – Nasir – Jekow Road	Trust Fund	Eyat	Under Execution
3	Pagak – Mathiang Road	UNOPS, Central Govt		
4	Malakal North – Khartoum Road	Unity Support Fund		
5	Malakal Town Internal Roads - 1	UNS	Sino Hydro	Under Execution
6	Malakal Town Internal Roads - 2	UNS	Kano	Under Execution
7	Paloic – Maban – Renk Road			

Source: Ministry of Finance and Economic Planning



Source: United Nations Joint Logistics Centre

Figure 6-5 Principle Roads Projects in UNS

(2) Issues for Road Transport Sector

The major identified issues for the road and transport sector are as follows:

- Improvement of road network within Malakal
Road network requires improvement both within Malakal Town and between the town and the new urban area for east-west direction.
- Construction of an all-weather road network with drainage

Since most of the roads in Malakal Town become impassable during the rainy season, roads are to be paved, and the network is to be well connected with a drainage system.

- Securing ample road space for safety and public transport

The road is to provide lanes for cars and non-motorized traffic to improve safety, and ample space for public transport.

- Creation of a systematic public transport network
At present, the private sector provides bus services without intervention from the public sector. However, the formation of an efficient bus route network and improvement of access to public transport is to be undertaken through intervention by the public sector.

- Traffic control

A traffic control system is to be established to cater for the increase in traffic volume and to reduce traffic accidents and congestion.

(3) Road Transport Plan

Ensuring stable road transport all year round is a prerequisite condition for the recovery and reconstruction of economic activities and the improvement of the living environment in Malakal Town. The bottleneck of storm water drainage is to be promptly solved along with road improvement. To this end, the drainage system is to be designed at an early stage with trunk road improvements.

In the area east of the Ring Road, main roads and storm water drainage are to be developed in the new town area as well. Networks with other transport modes are also to be enhanced to encourage reconstruction of economic activities and growth.

Access roads to the airport and port, and roads to be used for public transport to and from the central area of Malakal Town will be prioritized for social and economic activities.

The collection of special purpose revenue (taxes and commission on fuel, cars and transport-related economic activities) for the roads sector is recommended so that SMOPI&RD can manage operations with independent funding sources. Labour-based technology (LBT) and beneficiary-pay principles shall be introduced to road construction work to supplement the budget.

Table 6-8 shows the proposed highways and roads network system, and standard interval of each road, that was made based on existing road types and RoWs (Right of Ways) shown in the *Upper Nile State Physical Planning and Development Regulations, 2012 (Draft)*,

and residential plot allocations in Malakal Town.

Table 6-8 Proposed Standards of Highways and Roads

No	Type	RoW		Std. Interval	Class	Construction Method	Hierarchical Road Classification
		m	feet				
1	Primary Highway	90	300	8,000	1a	MBT	Regional Highway
2	Secondary Highway	60	200	4,000	1b	MBT	Trunk Road
3	Urban Road Type I	48(50)	160	2,000	2a	MBT	Arterial Road
4	Urban Road Type II	36(40)	120	1,000	2b	MBT	Collector Road
5	Urban Road Type III	30	100	500	2c	MBT	Distributor Road
6	Local Road Type I	24(25)	80	250	3a	LBT	Local Road
7	Local Road Type II	18(20)	60	60/120	3b	LBT	Community Road

Note: Figures of RoW in parentheses are currently applied by SMOPI&RD.

Source: JICA Project Team

The proposed road network as shown in **Figure 6-6** forms a grid pattern and coordinated east-west trunk roads in the existing Malakal Town and the new urban area.

As for the public transport plan, provision of a bus bay and bus terminal are proposed to achieve the following targets:

- To secure space for public transport services in road areas
- To optimally locate the public transport terminal

The proposed bus network in Malakal Town comprises a central terminal and a small terminal. It is proposed that large bus terminals, minibus terminals and taxi spaces are located in the central area of Malakal Town and along the Ring Road. In the areas where transport demand is too low to make profits, governmental subsidies may be needed.



Source: JICA Project Team

Figure 6-6 Proposed Road Network in Malakal Town

(4) Road and Transportation Projects

- RT-1 Community Road Construction Project (LBT)
- RT-2 Malakal Town Secondary Arterial Road Improvement Project
- RT-3 Malakal Town Arterial Road Improvement Project
- RT-4 Road Maintenance and Management Project
- RT-5 Public Transport Management Project
- RT-6 Malakal Town Bus Terminal and Bus Stop Facilities Construction Project
- RT-7 Traffic Management Project
- RT-8 Intersection and Traffic Facility Improvement Project
- RT-9 Malakal Town Traffic Safety Management Project

See **Table 10-1** for the outline of the proposed projects.

6.4 Energy

(1) Present Situation

Electric facilities in Malakal Town are operated by South Sudan National Electricity Corporation (SSNEC) under the SMOPI&RD, UNS, and the relevant authority of ROSS (the Ministry of Electricity). The Ministry of Electricity of ROSS is planning to improve Malakal's electricity issues. As a temporary solution, the Ministry has purchased three generators and started installation work.

Table 6-9 shows the outline of the existing SSNEC power generation system in Malakal. The main facilities are as follows:

- (i) Two units of the 1,000 kW Diesel Engine Generator (DEG) and two units of the 800 kW DEG are not operational.
- (ii) Four units of the 800 kW DEG are in operation, but only at night due to limited fuel oil supply.

Table 6-9 Status of Present Generating Plants at Malakal Power Station

(As of April 2012)

No.	Year Manufactured	Rated Output (kW)	Available Capacity (kW)	Current Status
1	China/2000	1,000	0	Not Operational
2	China/2000	1,000	0	Not Operational
3	CPL/2006	800	800	Operational
4	CPL/2006	800	800	Operational
5	CPL/2006	800	0	Not Operational
6	CPL/2006	800	0	Not Operational
7	CPL/2006	800	800	Operational
8	CPL/2006	800	800	Operational
9	CPL	(1,500)	0	Under Installation
10	CPL	(1,500)	0	Under Installation
11	CPL	(2,000)	0	Under Installation
Total			3,200	

Note: CPL: Caterpillar Corporation, USA

Source: UNS and JICA Project Team

The high voltage distribution system is an 11 kV network in Malakal Town with the following facilities:

- (i) Northern area: The length of the 11 kV network is approximately 7 km with ten units of distribution transformers. The current peak load from Malakal Power Station is 1,000 kVA.
- (ii) Southern area: The length of the 11 kV network is approximately 8 km with 21 distribution transformers. The current peak load from Malakal Power Station is 2,000 kVA.
- (iii) The total capacity of transformer facilities in Malakal Town is 6,500 kVA.

Figure 6-7 shows the power facilities in Malakal Town.

There is one power plant and two major lines extending from north to south and in the northern area.

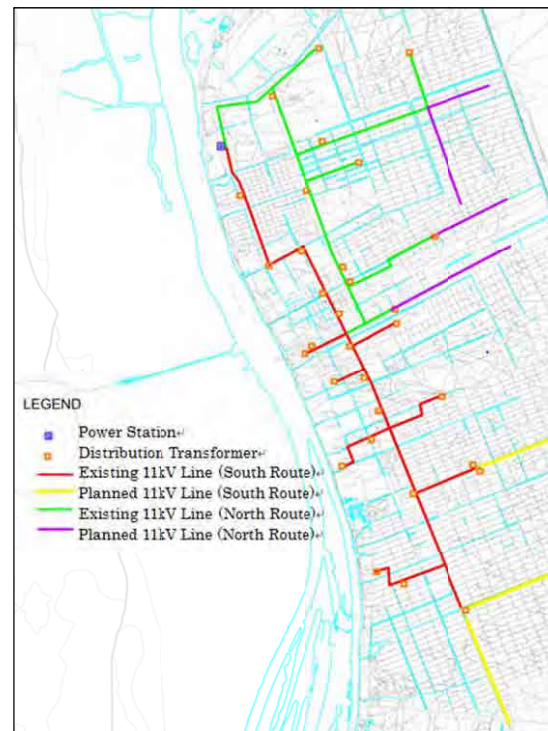


Figure 6-7 Power Facilities in Malakal Town

The household survey conducted as part of the Town Profile Survey provided information regarding the energy situation. Less than one third of all interviewed households was using electricity (156 compared to 492). Those depending on the power company accounted for 15.7%. Those depending on their own power generator totalled about 11.6% (**Table 6-10**).

Table 6-10 Provider of Electric Power Service

(As of January 2013)

Use of Electricity/ Provider of Electric Power Service	Number	%
Yes	156	31.7
Administrative power generation services	77	15.7
Self-power generation	57	11.6
Community-based power generation services	13	2.6
Private company services	4	0.8
Others	5	1.0
Sub-total	156	31.7
No Use	336	68.3
Total	492	100.0

Source: Town Profile Survey by JICA Project Team

(2) Energy Sector Issues

According to the household survey, electricity is provided by self-powered generation and community-based power services in addition to services provided by the South Sudan Electricity Corporation (SSEC).

Through analysis of the present condition of the power supply, the following issues were identified.

Urgent Issues

- Enhancement of operation and maintenance work of the existing DEGs
- Enhancement of management of the power station management

General Issues

- Reinforcement of power generator capacity especially for medium or low speed type DEGs
- Expansion of the distribution network of both 11 kV and low voltage (LV) systems to eastern and southern Malakal Town and areas to the east of the Ring Road
- Utilization of solar power generation
- Improvement of tariff collection system
- Improvement of operations and maintenance of power plants and networks

(3) Energy Supply Plan

The following plans have been set for the power supply sector.

- Restoration of capacity of SSEC generation facilities and service network by 2017
- Expansion of the rate of power supply covering households to 35% of Malakal Town, including the new urban areas.

The power supply is to be operated on a for-profit basis in order to lighten the burden on the administrative body. Management capacity is to be improved for the same purpose. Currently, diesel oil is only resource for the generation of electric power, which has the disadvantage for the stable supply in terms of transportation and cost. A pilot project utilizing substitutive energy resources is to be introduced to strengthen the self-supportive system. Production of firewood and charcoal is a major industry as residents use firewood and charcoal for cooking and ironing. The development of substitutive energy for households is to be devolved to market mechanisms.

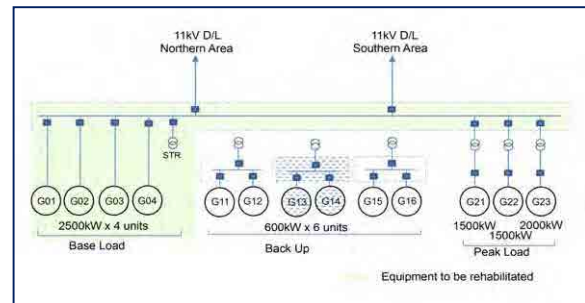


Figure 6-8 Key Single Line Diagram of Planned Malakal DEG Power Station

(4) Proposed Energy Projects

- EN-1 Power Plant Rehabilitation Project
- EN-2 Expansion of 11 kV Distribution Network Project
- EN-3 Solar Power Pilot Project

See **Table 10-1** for the outline of the proposed projects.

6.5 Sewage and Sanitation

(1) Present Situation

The Directorate of Water Sanitation and Rural Development (DWSRD) in SMOPI&RD is in charge of providing sanitation services to residents in UNS.

The roles of DWSRD are as follows:

- (i) Management of all aspects of water supply and sanitation matters
- (ii) Assistance in policy development and leading the implementation of water projects in the state
- (iii) Assessment and updates of water sector infrastructure development needs
- (iv) Assistance in support activities in coordination with other county support teams

The budget of the UNS government (based on the 2011/12 budget) for the water and sanitation sector is shown in **Table 6-11**.

Table 6-11 Budget for Water and Sanitation in UNS (2011/12)

	Budget (SSP)	
	DWSRD, SMOPI&RD	SMOPI&RD (All Directorates)
No. of Staff	159	655
Staff Salaries	598,115	3,394,657
Operations	67,266	470,864
Capital	0	20,730,630
Total	665,381	24,596,151
Remarks	2.7% of SMOPI&RD budget	

Source: SMOPI&RD, UNS

A larger budget is allocated in UNS to the road sector this fiscal year and only US \$0.23 million (equivalent to approximately 3% of all state budgets) is allocated to the water and sanitation sector. The table above demonstrates that UNS cannot cope with serious sanitation issues in the Project Area relying on its budget alone.

The JICA Project Team visited public toilets and sanitation facilities of households, schools and hospitals to verify the current sanitary conditions in Malakal Town. Based on the survey results, the current sanitary conditions in Malakal Town are summarized below:

Sanitation Facilities of Households

Sanitary conditions of general household are as follows:

- More than 30% of households do not have appropriate toilets, and currently defecate openly.
- There are few pour flush toilets, and pit latrines not

using water are widely used.

- Households with their own toilets use water bought from donkey carts to flush the toilet.
- Sludge pits have a very simple structure made from earth bricks. Sludge is withdrawn by vacuum truck once every few months. The charge is approximately 500 SSP each time.

Sanitation Facilities in Schools

The condition of school toilets is discussed below:

- Most primary and secondary schools have toilets funded by development partners. However, some schools do not have any toilets.
- Toilets were donated by The United Nations Children's Fund (UNICEF) in 40 schools.
- The number of toilets installed is insufficient and does not meet student demand.
- Pour flush toilets are few and pit latrines not using water are widely used.
- Water is brought by donkey carts at a cost of SSP 2 per 20 litres. UNICEF or ARC (an NGO) donate disinfectants for washing hands and drinking.

Public Toilets. Public toilets in Malakal Town are currently operated and maintained by Makal County Office. Public toilets were donated by CARE (an NGO). Two toilets were installed at each site at Malakal Market, Terawa Market, Dengershufu Market and Malakia Market in 2009. Public toilets operating at present are one toilet in Malakal Market, one toilet in Terawa Market and one toilet in Dengershufu. Market. Public toilets in Malakia Market were removed for road construction. One public toilet has four seats. All toilets use pit latrines that do not use water. Sludge pits have a simple structure of fabricated bricks with the dimensions of $\phi 2.4 \text{ m} \times 5 \text{ m}$ height. Construction costs for public toilets at one site are approximately US \$15,000 (using the 2009 price index).

According to the State Ministry of Health (SMoH), UNS, and a related person in CARE, a user fee of SSP 1 or SSP 2 for one use was considered inexpensive, and at a level that most people in town would be willing to pay. The financial balance for both the planned and current condition of public toilets is shown in **Table 6-12**.

Table 6-12 Financial Balance of Public Toilets/Month
(As of October 2013)

	Planned Condition by CARE Office (SSP)	Current Condition by Makal County Office* (SSP)
Income		
Use of a public toilet/month	3,000	6,000 or more
Expense		
Salary for Labour/Month	600	600
Costs for Withdrawing Sludge/Month	500	350
Sub Total	1,100	950
Balance	1,900	5,050 or more

Note: *Information is based on the verbal answers of the person in charge of the county office.

Source: JICA Project Team

Sanitation Facilities at Major Institutions. Major institutions such as universities or hospitals have their own water purification plants and many toilets have showers. Pour flush toilets have been adopted, but approximately half of toilets cannot be used due to a lack of maintenance. Institutions do not have any wastewater treatment facilities to collect and treat wastewater generated from the facilities. Instead, wastewater stored in pits is regularly withdrawn by a worker hired by the institution and transported to and discharged into a dumpsite outside of the town.

Vacuum Truck. Major institutions such as universities or hospitals and large private hotels in town own vacuum trucks for their own use and sludge generated is withdrawn and discharged into dumpsites designated by Malakal Town.

Sludge generated from household or public toilets is consigned to individual companies registered in Malakal Town for withdrawal and disposal at a cost of SSP 250 per 4 m³ of sludge. Four individual companies are registered in Malakal Town at present.

(2) Sewage and Sanitation Sector Issues

The following are major issues identified for the sewer sector in Malakal Town:

- Reduction of open defecation to minimize water-borne epidemics
- Appropriate treatment of sludge and excrements in toilets
- Proper operation and management of public toilets

(3) Sewage and Sanitation Plan

Engineering plans for construction of sanitation facilities by 2022 have been established as follows:

- Widespread use of pure flush toilets
- Pure flush toilets and ventilated improved pit (VIP) latrines are to total 90% or more coverage among the population.

- Toilets at schools are to meet demand. Public toilets are to be widespread.

Toilets that meet the demand of all students are to be installed in schools. Public toilets including those in institutions are to be installed so as to cover 36% or more of the population in Malakal Town

- Promotion of on-site sanitation facilities
- Facilities such as septic tanks are to be adopted for wastewater treatment.

- Sludge treatment plant construction
- One sludge treatment plant, which can treat human waste of approximately 250,000 people, is to be constructed near Malakal Town.

The following measures should be taken for the prevention of infectious diseases and the improvement of sanitary conditions.

- Promotion of capacity development of staff related to the treatment of sewage

A study Programme focusing on the operation and management of public sanitation and hygiene will be conducted together with the construction of sanitation facilities.

(4) Proposed Sewage and Sanitation Projects

- SS-1 Community Sanitary System and Public Toilet Installation Project
- SS-2 Construction of Sludge Treatment Facilities Project
- SS-3 Technical Project for Toilet Operation and Maintenance
- SS-4 Project for Improving the Sanitary Environment in Malakal Town
- SS-5 Public Toilet Operation and Maintenance Project

See **Table 10-1** for the outline of the proposed projects.

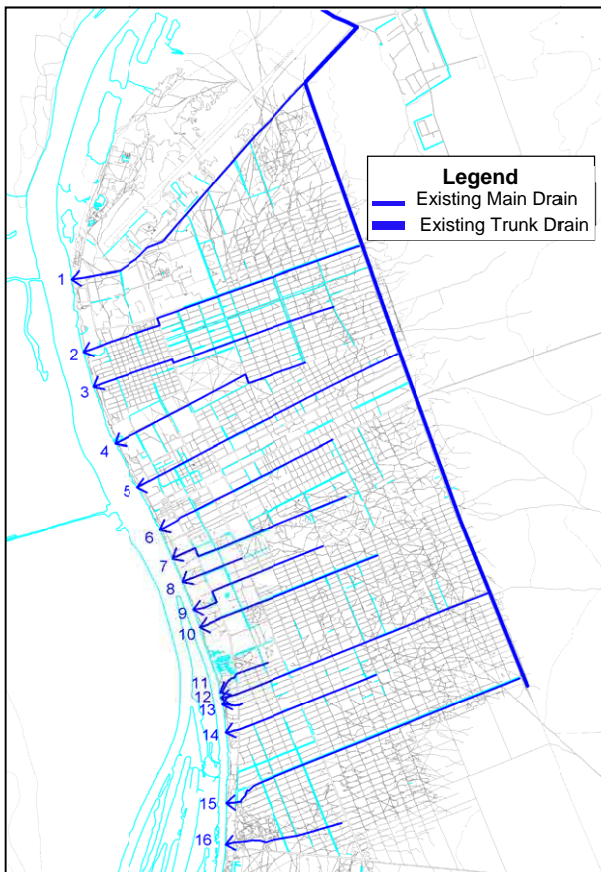
6.6 Storm Water Drainage

(1) Present Situation

Most of the storm water facilities in Malakal Town are located along the roadside and are administered by the SMOPI&RD. Cleaning of drainage facilities is sometimes undertaken by Malakal Council as part of town cleaning.

The Department of Roads and Bridges (DRB), under the Directorate of Roads and Transport, SMOPI&RD, is responsible for planning, construction and maintenance of storm water facilities in accordance with the *Structure and Job Descriptions 2012, SMOPI&RD*.

Figure 6-9 shows the existing trunk and main drains in Malakal Town. The trunk drain runs in a north-south direction, and the main drains are located from east to west in the direction of the Nile River. The number of main drains is 16; some of them are located along roads, and a few of them are away from roads.



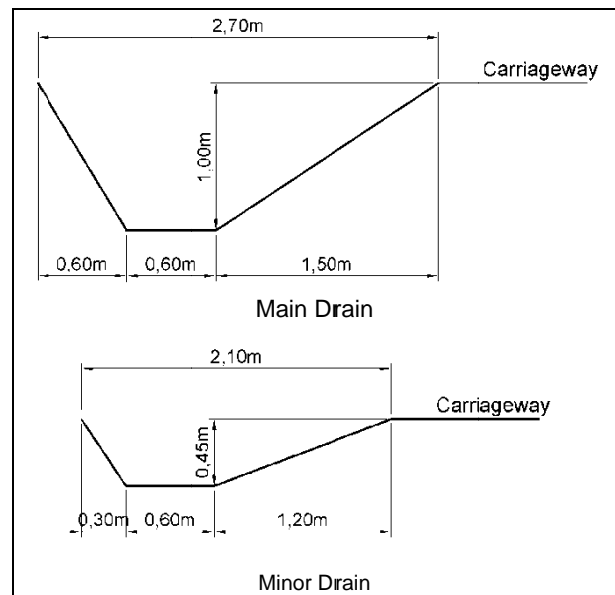
Source: JICA Project Team

Figure 6-9 Present Drainage Network

The minor drains are side ditches installed on both sides of all roads, except where main drains exist.

All of them were constructed solely by digging. According to the RBD of SMOPI&RD, there are two

types of drain as shown in **Figure 6-10**.



Source: Result of interview with SMOPI&RD by JICA Project Team

Figure 6-10 Standard Cross Section of Drains

These cross sections are a typical design, which SMOPI&RD intends to standardize. However, this does not necessarily mean that all existing drains conform to the shapes and sizes indicated in the cross section.



Photo A Main Drain in Malakal Town

(2) Storm Water Drainage Sector Issues

The following are identified issues that require immediate attention to address serious storm water stagnation in Malakal Town:

- Construction of a drainage system based on the accurate topographic inclination
- Construction of a drainage system coupled with road network improvement

The following issues are raised in regard to capacity building:

- Drainage facilities data is to be prepared by SMOPI&RD
- A budget for drainage works is to be secured.
- Technical staff in charge of the drainage system are to undertake professional development
- Equipment including a loader and excavator is to be secured.

(3) Storm Water Drainage Plan

The target set is to complete the network of main drains in urban areas and connection with the Nile River by 2022. The length of trunk drains by 2022 will be 19.7 km, including 8.8 km of existing trunk drains.

Plans for the storm water drainage sector have been conceived as follows:

- Relief of bottlenecks

The relief of bottlenecks of the drainage network is necessary, as main drains frequently experience stagnation, especially in Central Malakal.

- Intensive improvement in Central Payam

Failure to maintain the road network in a passable state throughout the entire year due to drainage stagnation leads directly to a paralysis of state capital functions. Intensive improvements are therefore required in Central Payam.

- Effective drainage network formation

The main drains in the existing Malakal Town are currently discharged into the Nile River, but it was recommended that discharge from the east half of the area be directed toward the Trunk Drain along the Ring Road. The main drains in the new development area are to be installed in an east-west direction and collected water is to be discharged into the trunk drains along the Ring Road and Outer Ring Road.

- Organizational reformation

Expert/s on storm water drainage systems should be employed, and heavy equipment is to be arranged in SMOPI&RD so that emergency measures can be undertaken. For drainage at the community level, a self-supportive system is to be formulated in the medium term.

(4) Proposed Storm Water Drainage Projects

- WD-1 Reconstruction of Main Drains in Central Malakal Project
- WD-2 Reconstruction of Main Drains Project
- WD-3 Extension of Trunk Drain 1 Project

WD-4 Construction of Trunk Drain 2 Project

WD-5 Construction of Main Drains in New Urban Area Project

WD-6 Capacity Development Project for Operation and Maintenance of Drains

See **Table 10-1** for the outline of the proposed projects.

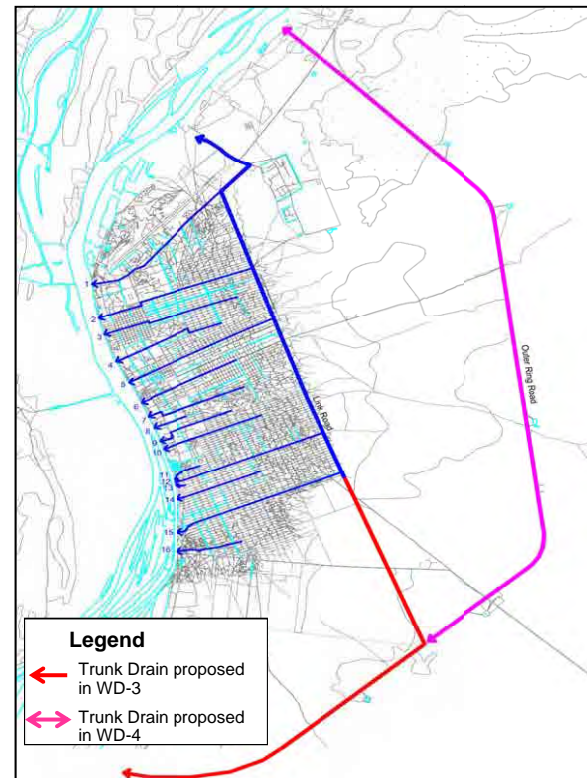


Figure 6-11 Construction of Trunk Drains 2 (WD-4)

6.7 Solid Waste Management

(1) Present Situation

The State Ministry of Health (SMoH), UNS, used to be the main agency handling solid waste management. The General Sanitation for Environmental Corporation Department (GSECD), which has responsibilities for solid waste collection, came under the SMoH. After Decree No.1/2012 (related to changes of governmental policy on administrative systems) was implemented, the GSECD was transferred to Malakal Council. The SMoH still has a department for garbage and sewerage that handles public health. The SMoPI&RD also has a role in the development of solid waste treatment and disposal facilities. Several agencies have various responsibilities and are involved with solid waste management.

As of June 2012, the *Environmental Protection Bill* was under preparation by the central government. The Director of GSECD said they were performing their duty under the *Sanitation and Environmental Law* of 2002, which was a law introduced before independence.

In Malakal Town, ordinances and regulations relating to solid waste management have not been implemented. No plans, such as a master plan on solid waste management, have been prepared.

These circumstances have resulted in a situation in which it was very difficult for GSECD to prepare plans because there was no definite demarcation as to which agency should primarily handle solid waste management.

As for domestic solid waste, most residents treat and dispose of their garbage by themselves. The most common way of dealing with combustible garbage is burning it in backyards. Public institutions such as universities treat solid waste in the same manner. Non-combustible garbage such as aluminium cans, pet bottles and ceramics are sometimes collected by collection vehicles or may be thrown away elsewhere.

Existing collection points with facilities are being set up near markets. Volumes of waste generated from markets may be gathered and collected at collection points. Sweepers (who are hired by the GSECD) carry out sanitation activities in town. The sweepers sweep roads and pick up waste from side ditches, and store waste temporarily on the roadside. Waste collection and disposal workers go around the town to collect waste from collection points and roadsides where waste is kept

temporarily to take to landfill sites. Activities of the GSECD are shown in **Table 6-13**.

Table 6-13 Environmental Corporation Department General Sanitation Activities

(As of June 2012)

Items	Description
Name of Department	General Sanitation for Environmental Corporation Department (under Malakal City Council)
Main Duties	Drainage, general sanitation, solid waste management
Main Operations	1. Sweep town Working time: 8:30 AM ~13:00 PM Monday-Friday No. of sweepers: 100 persons* Salary: SSP 80/month 2. Garbage collection Working time: 8:30 AM ~17:00 PM Monday-Sunday No. of waste collection/disposal workers: 30 persons* Salary: SSP 670 /month/person
Collection Vehicles	Collection vehicles: 2 vehicles (volume: 12 m ³) (Vehicles are rental cars. It costs SSP 12,000 /car/month with 1 manager and 1 driver.)
Collection Place	Frequency to landfill site: 3 times/day/one car Collection points:12 places (3 places/Payam)
Landfill Facilities	Two kinds of landfill (one for garbage, the other for human waste) Location: Out of town, approximately 4 km from Malakal Town. Disposal area (length×width×depth): Approximately 10 m × 5 m × 10 m Period of use for one disposal area: 2 weeks~1 month

*Dependent on budget availability.

Source: Interview Survey of General Sanitation for Environmental Cooperation Department under Malakal Town Council undertaken by JICA Project Team

Dustbins are not installed in Malakal Town. People throw their trash away anywhere. Hence, volumes of solid waste are scattered about, particularly at roadsides and ditches. Presently, about 100 sweepers (who are mostly female) sweep roadsides and ditches from Mondays to Fridays. The waste gathered by sweepers is left temporarily on roadsides, and waste collection and disposal workers collect the deposited waste with collection vehicles on a regular basis.



Photo Sweeping Activities

Some medical waste such as syringes, needles and bloodied clothes, which are infectious medical waste material, are very dangerous for patients and workers. Currently, source separation is not implemented in health facilities. However, workers do not often heed much attention to infectious waste. Medical waste generated from Teaching Hospitals is treated and disposed at temporary locations inside the hospital. It seems some infectious medical waste is incinerated, but the temporary storage locations are not properly equipped to manage medical solid waste.

(2) Solid Waste Management Sector Issues

After the survey of present solid waste management conditions, issues for solid waste management were identified as listed below.

- Strengthen capacity for solid waste collection
- Introduce source separation
- Reduce quantity of solid waste disposal
- Establish proper treatment methods for solid waste
- Define demarcation of duties and roles for solid waste management in related agencies
- Establish proper treatment and disposal systems for medical solid waste including infectious waste
- Secure a budget for solid waste management (collection/transportation, sanitation activities, landfill management)

(3) Solid Waste Management Plan

Management capacity for waste collection and landfill management is to be strengthened. Solid waste is to be collected regularly and transferred to the landfill site for appropriate disposal as soon as possible. Existing urban areas such as Central, Northern, Southern and Eastern Payam are to be incorporated into the service area for waste collection by 2022. Also, new urban areas to the

east of the Ring Road are to be included in the service area. The target collection ratio in the service area for 2022 is 50% of the total generated amount. Solid waste generated from hospitals is to be treated on-site. The following plans have been proposed:

- Improvement of solid waste collection/transportation
A door-to-door collection system is recommended for public institutions only, such as hospitals and offices. A collection point system is suitable for households in consideration of affordability of collection fees.

- Construction of intermediate treatment facilities
Intermediate treatment is one way to minimize the volume of solid waste disposal. Therefore, proper intermediate treatment methods should be taken into consideration.

- Introduction of disposal cell method
The current disposal cell method is reasonable given the climate conditions in Malakal Town.

- Improvement to the solid waste management system
A collection system for waste collection fees should be re-established. The mechanism through which a reasonable public subsidy is assigned should also be established.

- Capacity Development for Solid Waste Management
The Ministry of Health is defined as the lead organization for solid waste management and the General Sanitation for Environmental Corporation Department (GSECD) of Malakal Town is to be the direct responsible agency. Capacity of staff in SMoH and GSECD is to be enhanced.

(4) Proposed Solid Waste Management Projects

- SM-1 Solid Waste Collection Activities Improvement Project
- SM-2 Landfill Management Improvement Project
- SM-3 Medical Waste Management Improvement Project

See **Table 10-1** for the outline of the proposed projects.

6.8 Education

(1) Present Situation

In South Sudan, the majority of adults and youth have not had the opportunity to attend school due to decades of civil war. As a strategy for recovering education, the Ministry of General Education and Instruction (MOGEI) has established a parallel system of formal and alternative education systems.

The educational system in ROSS consists of early childhood development, primary education, secondary education, alternative education, technical schools and higher education. ROSS is following an 8-4-4 education system (eight years of basic education, four years of secondary education and four years of tertiary education). The State Ministry of Education (SMoE), UNS, is responsible for the implementation of basic, secondary and technical education. It is also involved in the administration of tertiary education.

Basic education and alternative education systems use the same curriculum though they have different systems for administering the syllabus. The MOGEI also promotes early childhood education, which will build a solid educational foundation prior to children joining the formal education system.

Table 6-14 below shows the 2010 budget for the SMoE, UNS. Salaries accounts for a large portion of the budget. Operation expenditure includes items such as contract employment and professional services, telecommunications and travel expenses. Capital is the main project cost including construction of schools, furniture and general equipment. Budget allocation handled by State Ministry of Finance, Trade and Industry (SMoF, UNS) to the SMoE is not sufficient.

Table 6-14 2010 SMoE UNS Budget by Item

(As of October 2010)

Category	2010 Budget (SSP)
Salaries	25,751,072
Operation	1,312,602
Capital	5,672,810
Total	32,736,484

Source: Sector Budget, Ministry of Education, Upper Nile 2011, SMoE, 2011

Primary Schools. The primary enrolment rate in Malakal Town is 70%. The situation is much better compared to that of UNS (60%) and ROSS (44.4%).

Table 6-15 also shows four indicators for the school environment: Of note, the education manager, head

teachers and their deputies do not have minimum academic and professional qualifications and experience.

Table 6-15 Overview of Primary Education in Malakal Town, UNS and ROSS

(As of 2010)

Area	Primary GER	Primary NER	PTR	PCR
Malakal	90%	70%	37.5	103.0
UNS	89%	60%	37.5	103.0
ROSS	68.8%	44.4%	63.7	151.7

Note: 1. GER is gross enrolment rate.

2. NER is net enrolment rate.

3. PTR is pupil/teacher rate.

4. PCR is pupil per classmate rate and only accounts for permanent and semi-permanent classrooms.

Source: Education Statistics for Southern Sudan 2010, SMoE, GOSS, 2011, Education Statistics for Upper Nile 2010, SMoE, 2011

Table 6-16 shows the number of primary school students, schools and teachers in Malakal Town. The number of students increased by more than 1.5 times from 2008 to 2010. The gender ratio has remained almost 50:50.

Table 6-16 Primary Schools in Malakal Town

(As of 2010)

Year	No. of Students			No. of Schools			No. of Teachers		
	Male	Female	Total	Public	Private	Total	Male	Female	Total
2008	9,287	10,232	19,519	26	8	34	295	159	454
2009	12,417	12,824	25,241	31	8	39	431	242	673
2010	16,357	14,986	31,343	29	12	41	487	206	693

Source: Education Statistics for Upper Nile 2010, SMoE, 2011



Photo Inside of a Primary School in Malakal Town

Secondary Schools. **Table 6-17** shows an overview of secondary education in Malakal Town, UNS and ROSS. The secondary school enrolment rate in ROSS is only 4.2%. This implies the existence of obstacles to students completing primary school and entering secondary school.

Table 6-17 Overview of Secondary Education in Malakal Town, UNS and ROSS

(As of 2010)

Area	Secondary GER	Secondary NER	PTR	PCR
Malakal	-	-	15.0	59.0
UNS	-	-	15.7	50.3
ROSS	4.2%	1.6%	14.9	42.9

Source: Education Statistics for Southern Sudan 2010, SMoE, GOSS, 2011 Education Statistics for Upper Nile 2010, SMoE, 2011

Table 6-18 shows that the number of students and teachers increased sharply in secondary schools. There are more male teachers than female teachers.

Table 6-18 Secondary Schools in Malakal Town

(As of 2010)

Year	No. of Students			No. of Schools			No. of Teachers		
	Male	Female	Total	Public	Private	Total	Male	Female	Total
2008	1,077	426	1,503	7	2	9	115	37	152
2009	1,384	384	1,768	7	5	12	155	21	176
2010	1,821	1,130	2,951	6	5	11	167	30	197

Source: Education Statistics for Upper Nile 2010, SMoE, 2011



Photo Classroom of a Secondary School in Malakal Town

Alternative Education Systems (AES). Education in UNS has been interrupted by the frequent recurrence of war in ROSS, and in UNS in particular. As a result, the illiteracy rate is 90% among females and 80% among males.

As a response to the educational needs of many out-of-school children and demobilized soldiers, Alternative Education Systems (AES) have been established. These are non-formal systems aimed at increasing learning opportunities for specific target groups, including adults (women and men between 30-60 years old), over-aged children and youths who missed out on basic education or dropped out of school (boys and girls between 12-30 years old).

Currently, there are 43 AES centres in UNS with 2,411

students (1,809 males and 602 females) and 121 teachers (117 males and four females).

Higher Education. The Upper Nile University (UNU) is located in Malakal Town, and consists of eight faculties (Medicine, Animal Production, Agriculture, Forestry, Public Health, Veterinary Medicine, Education, Human Development and Economics). The UNU was founded in 1991 and began classes in 1994. The UNU comes under the Ministry of Higher Education (MOHE) of the central government. The MOHE is responsible for the selection of students and recruitment of teachers.

Vocational Training Centre. There is a Vocational Training Centre (VTC) in Malakal Town under the Directorate of Vocational Training, Ministry of Labour. This VTC was established in 1976, and currently 28 instructors teach classes. Trainees must have at least graduated primary school to enter the VCT. The tuition fee is SSP 125 per year.

The following courses are offered: Auto-Mechanics (Petrol), Auto-Mechanics (Diesel), Auto-Electricity, Farm Machinery, Building and Construction, Carpentry, and so on.

(2) Education Sector Issues

The following issues for the education sector were identified through analysis of the present situation:

- Enhancement of education quality

Teacher education training courses should be implemented for not only science and mathematics content, but also English and educational management.

- Increased access to education

South Sudan is on track to achieve universal access and completion of free primary education and expand equitable access to post-primary education by 2022. The construction and rehabilitation of schools should be undertaken in consideration of the needs of those living relatively far from schools.

- Enhancement of literacy and alternative education

Since more than half of the residents of Malakal Town have only low writing proficiency in English or Arabic, it is essential to increase literacy and functional skills for youths and adults and provide alternative and accelerated learning opportunities for out-of-school children and adults without formal education.

- Enhancement of institutional and human capacity

Strengthening the capacity of education managers, systems and institutions is crucial to the improvement of the education sector in Malakal Town.

(3) Education Plan

Four main targets are set for the education sector. First of all, the Millennium Development Goals stipulate that universal primary education is to be achieved by 2015. Secondly, the improvement in the literacy rate is to be 70% mainly through primary education and alternative education. Thirdly, an 80% employment rate from Malakal Vocational Training Centre (MVTC) is to be achieved. Finally, it is recommended that UNS utilizes UNU graduates in its development.

In line with the national education policy, education service plans targeting year 2022 consist of the following areas:

a) Facility and equipment rehabilitation/reconstruction

Facility and equipment rehabilitation should be improved so that enough classes, water facilities, toilets and electricity are secured.

b) Facility construction

The lack of schools is a common problem in all Bomas. Schools should be constructed in order to reduce the uneven distribution of schools. Additionally, the SMOE should take measures for returnees, ethnic minorities and groups experiencing poverty. Also, some emergency construction of schools is necessary in the eastern area of the Ring Road where rapid population increases are occurring mostly due to high numbers of returnees.

c) Materials and equipment

It is necessary to provide textbooks and school facilities such as desks and chairs to all children. The establishment of a textbook sharing system from graduates to students is a possible solution in the community.

d) Capacity Development

Capacity development for teachers and staff of the SMOE is to be implemented to improve effectiveness of education services.



Photo Sample Image of a New School Building

(4) Proposed Education Projects

- ED-1 Primary School Establishment and Renovation Project
- ED-2 Strengthening Mathematics and Science Education Project
- ED-3 Capacity Building of SMOE Project
- ED-4 Malakal Teachers' Training School Construction and Renovation Project
- ED-5 Malakal Teachers' Dormitory Reconstruction Project
- ED-6 Malakal Primary School Construction Project
- ED-7 Malakal Middle School Construction Project

See **Table 10-1** for the outline of the proposed projects.

6.9 Health

(1) Present Situation

The Ministry of Health consists of seven Directorates: Planning and Coordination; Administration and Finance; Community and Public Health; Medical Services; Pharmaceuticals and Equipment; Training and Professional Department; and Diagnostic Services, as of 2011.

The UNS health care system includes one teaching hospital in Malakal Town; four County hospitals in Renk; Melut, Luakpini, and Longochuck; eight private or other hospitals, including military hospitals in Renk and Luakpini; 36 Primary Health Care Centres (PHCC); and 72 Primary Health Care Units (PHCU), as shown in Table 6-19.

Table 6-19 UNS Health Facilities Inventory

County	Teaching Hospital	County Hospital	PHCC	PHCU	Other	Total
Renk		1	5	5	1	12
Manyo			4	5		9
Fashoda			2	9	1*	12
Melut		1	1	7		9
Maban			2	8		10
Maiwut			2	3		5
Luakpini/Nasir		1	3	8	1	13
Longochuk		1	3	4		8
Ulang			2	6		8
Baliet			1	6		7
Makal	1		8	7	1* 4**	21
Panyikang			3	4		7
Total		4	36	72	8	121

*Private facilities; **4 specialized health facilities.

Source: Health Facility Mapping 2010, Ministry of Health, GOSS

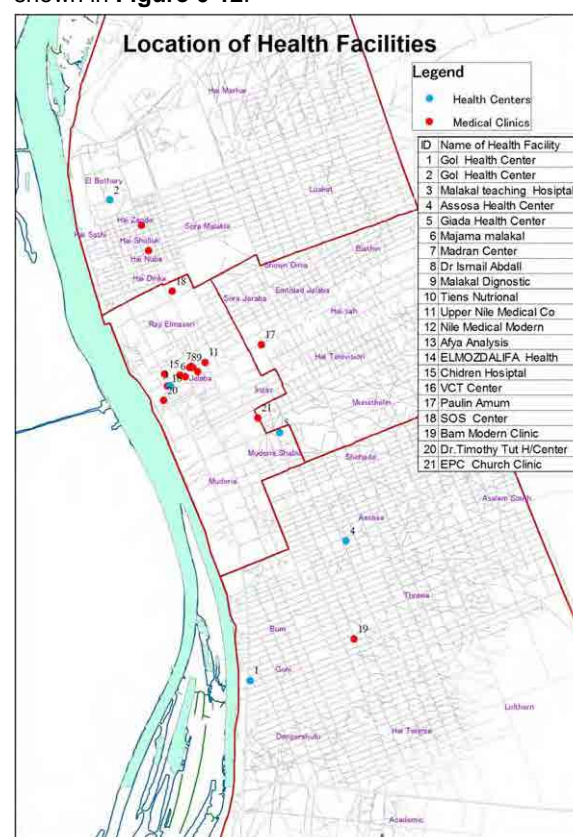
There is a critical shortage of all professional health cadres in UNS. Distribution per county is shown in Table 6-20. The indicators show on average 24,000 people per doctor; 2,047 people per nurse; 17,220 people per midwife.

Table 6-20 Distribution of Health Human Resources by Category and by County in UNS

County	Population	Doctor	Nurse	Midwife	Lab Tech	Pharmacist
Renk	137,751	7	5	5	4	2
Manyo	38,010	1	25	7	3	6
Fashoda	36,518	0	21	4	1	5
Melut	49,242	4	5	3	3	4
Maban	45,238	3	9	4	1	2
Maiwut	79,462	0	11	0	2	5
Luakpini/Nasir	210,002	4	12	2	4	0
Longochuk	63,266	3	6	1	2	9
Ulang	85,044	0	0	1	1	0
Baliet	48,044	1	11	7	2	1
Malakal	126,483	16	361	22	18	15
Panyikang	45,427	0	5	0	0	1
Total	964,353	39	471	56	41	50

Source: Health Facility Mapping 2010, Ministry of Health, GOSS

Within Malakal Town, health clinics are concentrated in the central area with few medical clinics and health centres operating in the southern and eastern areas as shown in Figure 6-12.



Source: Land Use Survey by JICA Project Team

Figure 6-12 Location of Health Facilities in Malakal Town

(2) Health Sector Issues

The following issues for the health sector were identified through analysis of the present situation.

- Effective and equitable access to health services
- Effective and rational allocation and distribution of limited resources

Basic health services are not adequately provided in proportion to population increases. Effective and equitable access to health services is to be pursued.

- Medical finances, budget, human resources, facilities and equipment are to be effectively allocated.
- Formation of a coordination and collaboration network system for health services

A network system is to be created among the SMOH, related ministries, international organizations and NGOs in order to provide effective health services.

- Renovation of medical equipment
- Medical equipment for high-end medical services is to be renovated in order to form an effective hierarchical

health service network.

- Capacity development of health/medical facilities and personnel

Capacity development for health/medical services for both the short and medium terms is to be pursued.

(3) Health Plan

Four main targets have been set in the health sector.

These are:

- i) Improvement of maternal and child health
- ii) Reduction in malaria patients
- iii) Reduction of vaccine-preventable disease patients
- iv) Realization of equitable access to primary health care facilities, such as PHCUs and PHCCs

The following strategies were proposed to attain these targets:

- Strengthening of the referral system among several levels of the health facilities
- Promotion of Public-Private Partnerships (PPPs)
- Proper allocation of health-related human resources and capacity development
- Updating and sharing of health information as well as improvements to its management mechanism
- Improvement of health service delivery systems structure and mechanisms
- Improvement of the emergency medical care system

A health plan was formulated in the following areas:

a) Medical facilities upgrade and construction

It is recommended that the four PHCCs in town are upgraded in order to provide inpatient services (though the expansion of the ward block in the existing facilities).

It is also planned to establish a PHCU and PHCC in the town in consideration of population growth.

b) Medical equipment improvements and related infrastructure

Standard equipment will be procured within each facility (Malakal Teaching Hospital and PHCCs). It is also necessary to improve the physical infrastructure of the health facilities, such as the electricity supply, water supply and drainage system

c) Improvement of the pre-hospital and emergency medical care system

Standards for medical services for the pre-hospital stage and emergency medical care facilities at all levels should be established, incorporating basic

health-related infrastructure in the plan.

d) Improvement of health/medical services

Health/medical services, including blood transfusion systems, drug supply logistics, maternal and child health care, sanitation, hygiene, infectious diseases control, and malaria control are to be improved.

e) Human Resources Development

Admission of students to medical institutes, nursing schools and colleges is to be carried out based on a needs analysis using an evidence-based approach to assess the rate of physicians and nurses.

f) Health Information System Improvement

A health information database system developed by international organizations and donors is to be effectively coordinated among concerned organizations.

(4) Proposed Health Projects

HE-1 Primary Health Care Centre Construction Project

HE-2 Malakal Teaching Hospital Health Infrastructure Improvement Project

HE-3 Health Service Capacity of Four Major Health Centres Upgrade Project

HE-4 Rehabilitation of Medical/Health Faculty in UNU Project

HE-5 Urban Malaria Control Programme

HE-6 EPI (Expanded Programme on Immunization, such as DPT3, Measles) Vaccination Promotion Project

HE-7 Human Resources Development for Maternal and Child Health Project

See **Table 10-1** for the outline of the proposed projects.

6.10 Capacity Development

Capacity development plans and projects were re-evaluated and independently proposed through a comprehensive and cross-sectoral approach.

(1) Concept of “Capacity Development”

“Capacity Development (CD)” is generally defined as “the process by which individuals, organizations, institutions and societies develop ‘abilities’ (individually and collectively) to perform functions, solve problems and set and achieve objectives” (UNDP, 1997).

According to the UNDP’s definition of CD, the general CD framework has three layers: individual, organizational and institutional/society. In this Project, CD needs were studied from the viewpoint of these three layers.

(2) CD Needs of UNS Officials to Implement the Comprehensive Plan

The Project Team conducted a “training needs survey” of counterpart personnel in March-April 2012.

- Individual CD

Many departments within SMOPI&RD answered basic computing (IT) and English language training as necessary for their staff. Various skills training on management, operations and maintenance are also in high demand in all sub-sectors.

- Organizational CD

The SMOPI&RD has already established the basic project implementation structure derived from the Comprehensive Plan. Each directorate needs to examine the present workload in terms of priorities, deadlines, and volume in order to develop new work system and establish the appropriate division of work within the directorate.

The following are proposed to reinforce departments and sections within the SMOPI&RD.

- Water Supply Sector: Water Audit Division, Water Tariff Collection Division, and Water Users’ Committees.
- Road Transportation Sector: EIA Division, Road Traffic Control Division
- Sewage and Sanitation Sector: Sanitation Facilities O&M Division, Sanitation Facility (public toilets) Tariff Collection Division

The SMOPI&RD also has to consider strengthening capacity (quality and quantity) at the senior inspector

level.

The main recommendations for institutional reforms and development are summarized in **Table 6-21**.

Table 6-21 Recommendations for Institutional and Functional Reforms and Development Systems

Sector	Recommendation
Water Transport	Single Window System, Loading/Unloading System, Port Tariff and Taxation System, Safety Standards, etc., have been identified and recommended as prioritized CD activities.
Water Supply	Drawing Standards Pipe-Network, Mid-term & Long-term O&M Action Plan, M&E System, Management Plan for the Water Intake Facility and/or Water Treatment Plant, O&M System of Pipelines, Water Tariff Collection System, Complaint Handling System, Water Examination Standards, etc.
Road Transport	Traffic Rules/Regulations, Guidelines on Environmental and Social Considerations, Regulations Regarding Importing Equipment and Materials for Road Construction, Inspection Standards, Road Traffic Control Manual, etc.
Energy	Technical Standards and Design Criteria for Facilities, Inspection Guidelines/Manuals, Annual Inspection Plan, Tariff Collection System, etc.
Sewage & Sanitation	Annual Plan for Construction of Public Toilets, O&M System for Public Toilets, etc.
Storm Water Drainage	Annual Plan for Storm Water Drainage, UNS Rainfall Intensity Formula, Storm Water Drainage Facilities Design Standards, Construction Supervision Manual, Annual O&M Plan, Monitoring Guidelines, Annual O&M Plan on Machines and Equipment, etc.
Solid Waste Management	New Collection System for Solid Waste, Proper Plan on Collection, Maintenance Plan for Vehicles and Required Equipment, Maintenance Plan for Landfill, Regulation of Landfill Construction, Regulation of the Treatment of Medical Waste, Guidelines for the Treatment of Medical Waste, etc.

Source: JICA Project Team

(3) Capacity Development Plan

The following are identified as capacity development projects.

CD-1 Local Government Administration Improvement Project

CD-2 Cost Recovery System Improvement Project

ID-1 Police Box and Community Police System Establishment Project

ID-2 Malakal Juba Urban Management System Project

ID-3 Land Registration System Improvement Project

See **Table 10-1** for the outline of the proposed projects.

The following training modules corresponding to urgent needs were conducted during the course of the Project. Trainees were enlisted from the SMOPI&RD and relevant organizations.

- a) GIS and AutoCAD Training
- b) English Documentation, IT Training
- c) Accounting Training
- d) Project Management Training
- e) Vocational Training (LBT) (on-the-job training was conducted under the Urgent Development Projects. See Section 14.

6.11 Economic Development

Unlike conventional urban development planning, this Project emphasizes economic and social development. This is in consideration of the unique conditions of Malakal, which is characterized by social instability after many years of civil war and the influx of returnees as well as economic handicaps.

(1) Situation and Needs

The economic development of Malakal Town can be realized only through synchronized development efforts with the surrounding areas that include the following:

- Dissemination of technologies
- Processing of raw materials, especially agro-products in the initial stage
- Creation of a tourism base
- Creation of a base for financial services
- Creation of a centre of education

Consideration of the following social aspects will also work to distribute the fruits of economic growth as equally as possible and minimize any negative impacts of economic growth.

- Provision of social services such as education and health services to all segments of the population
- Consideration of culture and amenity

The following are urban infrastructure improvement aspects addressing cross-cutting issues:

- Node of transportation
- Centre for commodity trade

(2) Economic Development Plans

Planning areas for the economic development of Malakal Town up to 2022 have been established as follows.

- a) Promotion of the improvement and development of road networks within Malakal Town and surrounding areas, both regional and international, especially those connecting to Ethiopia
- b) Provision of an effective and efficient business and trade environment, both physically and institutionally, that supports private sector activities in such areas as commerce, financial services, tourism and manufacturing
- c) Strengthening of research and development functions in the agriculture, livestock, poultry and fishery sectors

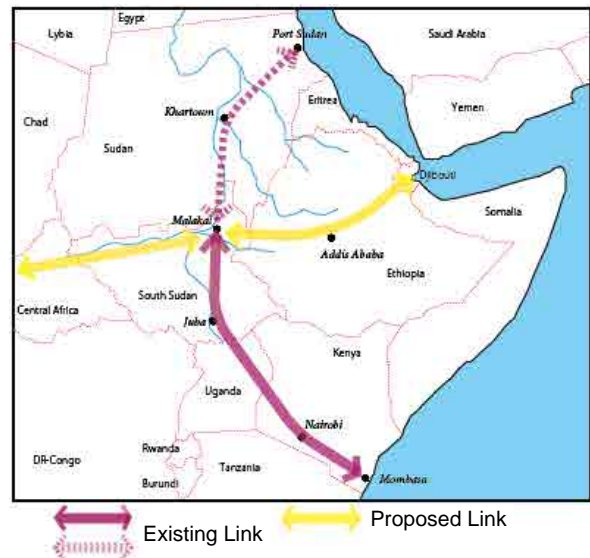


Figure 6-13 Proposed East-West Transportation Corridor

- d) Strengthening of function of for the extension service through capacity development of extension officers based on the outcomes of research and development activities, and strengthening logistics support
 - e) Promotion of the development of human resources conducive to economic development
- Established planning areas for the social development of Malakal Town up to 2022 are as follows.

(3) Proposed Projects for Economic Development

- EC-1 International Transport Corridor Establishment Project
- EC-2 Malakal Airport Internationalization Project
- EC-3 Malakal Rural Road Network Improvement Project
- EC-4 Upper Nile Fisheries Project
- EC-5 Malakal Dairy Farm Project
- EC-6 Malakal Poultry Breeding Farm Project
- EC-7 Malakal Slaughter House Construction Project
- EC-8 Malakal Light Industrial Park Development Project
- EC-9 Logistics Hub Development Project
- EC-10 Research Function and Support Services Development Project
- EC-11 Malakal Vocational Training Centre Reinforcement Project

See **Table 10-1** for the outline of the proposed projects.

6.12 Social Welfare

(1) Situation related to Social Welfare

The Ministry of Gender and Social Welfare (MGSW) is responsible for protecting and supporting the lives of socially vulnerable people such as children, disabled people, senior citizens and women. While their activities must be undertaken within the policy framework of the ministry, officers appear to be overwhelmingly occupied with day-to-day obligations involving direct contact with these people in vulnerable conditions. The officers protect street children and abandoned children, support disabled people by providing wheelchairs and blind sticks, encourage income generation by women by providing sewing machines, and so on. The officers see technical enhancement related to community development and the empowerment of women as high priority approaches. Strengthening the collaboration between MGSW and Malakal City Council is an important issue.

In relation to Participatory Development and/or Community Development, various activities proposed by the Project should involve local communities from Malakal Town. Communities, which have lost traditional values and human ties due to a long-lasting civil war, should be strengthened and revitalized. The lowest tier of government, such as Malakal Town, is in the best position to support community development in this context. In this regard, the role of Malakal Town Council should be strengthened.

(2) Needs

The following are identified needs that cannot be categorised into the fixed sectors described from 6.1 to 6.9, however should still be addressed in the comprehensive plan.

- Prevention of ethnic conflicts
- Special attention to socially vulnerable people such as orphans, widows, physically disabled individuals and juvenile delinquents under corrective Programmes
- Special attention to IDPs and returnees
- Enhancement of peoples' capacity through community development
- Development of a legal and procedural system for urban development such as building codes and zoning acts
- Development of a land registration system

- Development of a financial management system based on a cost-recovery principle

(3) Plans for Social Welfare

Established planning areas for Social Development and Welfare are as follows:

- a) Participation of people and involvement of local communities
- b) Provision of cultural and amenity facilities

Participation of people is required for Malakal Town to develop in a vibrant manner. It is because of that communities, which have lost traditional values and human ties due to the long lasting civil war, should be strengthened and revitalized. The lowest tier of government such as Malakal Town is in the best position to support community development in this context. Furthermore, provision of facilities in which people can spend time together is useful approach to revitalise the social ties.

(4) Proposed Projects for Social Welfare

- SW-1 BHN (Basic Human Needs) for Returnees Project
- SW-2 Malakal Street Children Centre Renovation Project
- SW-3 SMOGSW Speed Boat Project
- SW-4 Malakal Reformatory Centre Establishment Project
- SW-5 Upper Nile Culture Centre Project
- SW-6 Malakal Town Women's Group Community Empowerment Project
- PD-1 Participatory Development Planning System Establishment Project
- PD-2 Human Resources Development for Community Development Officer (CDO) Project

See **Table 10-1** for the outline of the proposed projects.

7. ECONOMIC AND FINANCIAL ANALYSIS

7.1 Analytical Approach

An economic evaluation was undertaken to the proposed projects. Financial and economic analysis was also conducted over the projects with urgent needs to measure the financial and economic impacts quantitatively from related investment schemes designed by the Project Team.

In the framework of time-discount cash flow analysis⁴, Internal Rate of Return (IRR) and Net Present Value (NPV) measurement indices were used to estimate impacts, with a set of variables and assumptive parameters. Following the results, discussions and conclusions are given while highlighting financial and economic issues.

Long-run Marginal Cost (LRMC) pricing in compliance with generally accepted guidelines for economic analysis was applied in the estimation of economic benefits.

7.2 Result of Economic and Financial Analysis

Numerical analysis was undertaken for some of the proposed projects (such as potential urgent development projects) to be implemented as part of this Project. Summarized results of FIRR (Financial Internal Rate of Return) and EIRRs (Economic Internal Rate of Return) for each of the sector projects are given in **Table 7-1**.

Table 7-1 Result of Economic and Financial Analysis

	FIRR	FNPV	EIRR (%)	ENPV with discount rate 8%, (mil. USD)
WS-2	Unable to estimate	Unable to estimate	10.1	6.3
WS-4	Unable to estimate	Unable to estimate	9.5	2.5
Water Transport	Unable to estimate	Unable to estimate	9.4	3.0
Road Transport	N/A	N/A	9.3	8.2
Energy	N/A	N/A	6.5	-2.2
Storm Water Drainage	N/A	N/A	9.5	3.2

Source: JICA Project Team

Note: The costs used in the analysis were preliminary.

Note that the ENPVs (Expected Net Present Values) among the seven projects vary widely even though the

⁴ Time-discount cash flow analysis is a method of valuing a project, company, or asset using the concepts of the time value of money

EIRR figures are more or less the same as each other simply because the magnitude of investment among these projects is different.

7.3 Conclusion of Economic and Financial Analysis

Project EIRRs close to the feasibility cut-off rate of 8.0% would be acceptable as public investment opportunities, provided that the concerned projects are primarily considered as environment protection, and urgent need for human basic needs to fulfil schemes.

Development of social and economic infrastructure in the region will promote industrial growth; hence, these projects are to be implemented through concerted efforts by central and regional governments, with financial assistance from international financing institutions.

On the other hand, the followings may be fragile in the mid to long term: the financial sustainability and sound operations of the South Sudan Urban Water Corporation (SSUWC) and agencies responsible for river transport under the central government (Directorate of the River Transport) and Upper Nile State (River Transport Department). In view of this, policy discussions and/or firm actions related to tariff restructuring and downsizing project costs are strongly called for.

It should be reiterated that the analysis undertaken here is only indicative at this early stage of project planning. Each project is to be further studied and analysed for more precise results.

8. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Environmental and social impact assessments of the proposed projects were conducted. The Ministry of Environment (MOE) has jurisdiction over the general administration of the environment in South Sudan. The Environmental Compliance Department is responsible for Environmental Impact Assessment (EIA) inspections.

8.1 Predicted Major Environmental and Social Impacts by Sector

The outline of major predicted impacts is shown in **Table 8-1**. Mitigation measures for the proposed project are presented in the Main Text.

Table 8-1 Outline of Predicted Impacts (1/2)

	Impact	Rate	Description
Social Environment	Involuntary Resettlement	B	(WS) Treatment plant and elevated tank will be constructed in a zone where small-scale shops are located. (RT) It is likely that residents will be resettled due to construction of a bus terminal. (PT) Feasibility Study (F/S) is necessary. (WD) It is likely that resettlement will occur due to WD projects. (SS) (SM) Resettlement will be expected within the project area. (EN) The construction of a power station may cause some involuntary resettlement. (ED) School construction may cause some involuntary resettlement. However resettlement is likely to be minor. (EC) (SW) (CD) Extent of impact is unknown at this stage.
	Local Economy, Employment Livelihood	B	(WS) It is likely that adverse impacts on water sellers will be minor due to population increases. (WS) (RT) (PT) (WD) (SS) (SM) (EN) (ED) (HE) (EC) (SW) (CD) Construction works will create employment, and most workers will be hired in Malakal Town. (PT) During construction, few activities are likely to provoke adverse impacts.
	Land Use, Utilization of Local Resources	B	(WS) Some adverse impacts are expected due to plant and tank construction. (RT) Expansion of current roads or construction of new roads may traverse farms or residential areas in some projects. (PT) (WD) (EN) (ED) (HE) Few activities are likely to provoke adverse impacts. (SS) It is necessary to obtain land for required facilities (around 200 m ²) and 482 public toilets. (SM) It is necessary to obtain land for Waste Management facilities (around 25 ha) and 20 collection points.
	Local Community	C	(ALL) Development Programmes and relevant projects will benefit all communities.
	Existing Social Infrastructure and Services	B	(WS) (PT) (WD) (SS) (SM) (EC) (SW) (CD) Traffic congestion is likely to increase during construction.
	Poor, Indigenous and Ethnic Communities	-	(ALL) No activities are likely to provoke adverse impacts.
	Misdistribution of Benefit and Damage	C	(ALL) Relevant projects are likely to positively influence all community members, or few activities are likely to provoke adverse impacts
	Cultural Heritage	-	(ALL) Cultural and Historic Heritage does not exist at the Project site.
	Local Conflict of Interests	C	(ALL) Few activities are likely to provoke adverse impacts.
	Water Usage and Rights	B	(WS) Access to water is likely to improve. (RT) Transport projects will promote a social infrastructure development system. (PT) During construction water use will be limited to avoid potential contamination of water.
	Sanitation	B	(ALL) Sanitary conditions around the construction site are likely to become unfavourable due to generation of waste and unsuitable human waste treatment.
	Accident	B	(ALL) Risk of traffic accidents is likely to increase due to an increase of construction vehicles and cargo handling heavy machinery during construction and operation.
	Infectious Diseases such as HIV/AIDS	B	(WS) (RT) (WD) (SS) (SM) (EN) (ED) (EC) (SW) (CD) Few or no activities are likely to provoke adverse impacts. (HE) Some activities are likely to provoke positive impacts.

Note: Abbreviations

WS	Water Supply Sector (WS-1,2,3,4)
RT	Road Sector (RT-1,2,3,4,5,6,7,8,9)
PT	Port Sector (PT-1,2,3,4,5,6,7,8,9,10,11)
WD	Storm Water Drainage Sector (WD-1,2,3,4,5,6)
SS	Sewer Sector (SS-1,2,3,4,5)
SM	Solid Waste Management Sector (SM-1,2,3)
EN	Energy Sector (EN-1,2,3)
ED	Education Sector (ED-1,2,3,4,5,6)

HE	Health Sector (HE-1,2,3,4,5,6,7)
EC	Economic Development
SW	Social Welfare
PD	Participatory Development under Social Welfare
CD	Capacity Development
ID	Institutional Development under Capacity Development
ES	Emergency Service Reinforcement Programme
ALL	All Sector

Table 8-1 Outline of Predicted Impact (2/2)

	Impact	Rate	Description
Natural Environment	Geographical Features	-	(ALL) No activities are likely to provoke adverse impacts.
	Soil Erosion	B	(PT) During the construction stage the outflow of surface soil is likely to occur unless proper embankment works are undertaken in the case of PT-3, 4, 9 and 10.
	Groundwater	B	(SS) Few activities are likely to provoke adverse impacts. (SM) Effluents from the landfill site may pollute inflowing and underground water.
	Coastal Zone	B	(PT) There is a possibility of sedimentation due to the type of wharf.
	Flora, Fauna, Biodiversity	B	(ALL) There is a game reserved called EZ Zeraf to the south of Malakal Town and one called Fanikang located on the west side of the Nile River. Protected conversation areas such as national parks or forest reserves are not found in the study area. Few rare and endangered species such as those listed by the IUCN and CITES are found in the area. However habitat of the IUCN-listed Nile crocodile is found in the Nile River, which may be negatively affected. (WS) (EC) (SW) (CD) Few/many trees will be cut down due to construction. (RT) It is likely that many trees will be cut down during construction considering the length of road in the case of RT-2, 3 and 6. (PT) There are not many trees along the Nile River. Few activities are likely to provoke adverse impacts. (WD) It is likely that many trees will be cut down during construction considering the length of drainage, in the case of WD-2, 3 and 4. (SS) It is likely that many trees will be cut down during construction considering the dimensions of sludge treatment facilities. (SM) It is likely that many trees will be cut down during construction considering the dimensions of waste management facilities. (EN) (ED) (HE) It is likely that many/few trees will be cut down during construction.
	Meteorology	-	(ALL) No activities are likely to provoke adverse impacts.
	Landscape	-	(ALL) No activities are likely to provoke adverse impacts.
	Global Warming	-	(ALL) No activities are likely to provoke adverse impacts.
Pollution	Air Pollution	B	(WS) (PT) (RT) (WD) (SS) (SM) (EN) (ED) (HE) (EC) (SW) (CD) It is likely that pollution will increase during construction and operation due to the increase in traffic and usage of machineries and generators.
	Water Pollution	B	(PT) During construction, bottom sediment and inflow of excavated soil may pollute the river water. Oil spills from vessels may also pollute the river water. (SM) Effluents from the landfill site may pollute inflowing and underground water.
	Soil Contamination	B	(WS) (WD) (SS) (EN) (ED) (HE) (EC) (SW) (CD) No activities are likely to provoke adverse impacts. (RT) Oil spillages from construction vehicles during construction are likely to occur. (PT) Oil spillages from construction vehicles during construction and cargo handling equipment and generators during operations are likely to occur. Additionally, if dredged riverbed soil is contaminated, the soil disposal site environment is likely to be devastated. (SS) Sludge needs to be periodically removed from the sewage plant; though it will not be a toxic. (SM) Soil contamination will occur from toxic waste solids.
	Solid Waste	B	(SM) The current situation is likely to improve. (ED) The quantity of waste from school activities is likely to increase. (HE) The quantity of waste from health centres and hospitals is likely to increase.
	Noise and Vibration	B	(RT) Noise and vibrations arising from construction works and cargo handling activities are expected. In addition, as road conditions are improved by paving, the increase in traffic volume may also significantly increase noise, vibrations, and pollution.
	Ground Subsidence	B	(ALL) No activities are likely to provoke adverse impacts.
	Offensive Odour	B	(RT) (PT) Possible offensive odours from emissions from construction vehicles during construction will increase. (SM) The landfill site is likely to provoke a strong smell if no appropriate countermeasure is adopted.
	Bottom Sediment	B	(PT) There is the possibility of bottom sediment deterioration due to inflows of soil from the construction site. A baseline survey for regular observations is necessary.

*IUCN: International Union for Conservation of Nature and Natural Resources

CITES: The Convention on International Trade in Endangered Species of Wild Fauna and Flora

Source: JICA Project Team

<PART IV>
COMPREHENSIVE SOCIAL ECONOMIC
INFRASTRUCTURE DEVELOPMENT PLAN

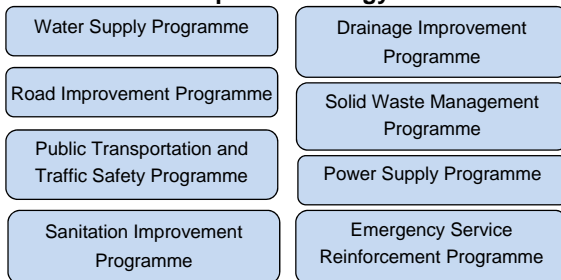
This chapter presents the comprehensive social economic infrastructure plan (the Comprehensive Plan), which consists of Programmes corresponding to the Development Strategies. The proposed projects in Chapter 7 are combined in a way to materialize the Development Strategies into a total of 19 Programmes.

9. THE COMPREHENSIVE PLAN

9.1 Malakal Infrastructure Development

The following eight Programmes are incorporated into the urban infrastructure development strategy. They are: 1) water supply, 2) roads, 3) public transportation and traffic safety, 4) sanitation, 5) storm drainage, 6) solid waste management, and 7) power supply. 8) Emergency services for firefighting and medical services are also included.

Programmes for the Malakal Infrastructure Development Strategy



9.2 Region-wide Economic Development

The following four Programmes are formulated based on the Region-wide Economic Development Strategy.

Programmes for the Economic Development Strategy



1) The “Region-wide Transportation and Logistics Development Programme” aims to build a base for economic development through developing a region-wide transportation and logistics network connecting Malakal Town with other regions and

neighbouring countries to ensure smooth traffic flows. 2) The “Industrial Development Programme” will promote growth of primary sector activities such as fisheries, livestock, poultry and agriculture in the areas surrounding Malakal Town. 3) The “Investment Climate Improvement Programme” aims to improve the investment climate for the private sector through construction of an industrial park and logistics base in the southern part of Malakal Town. 4) The “Research and Industrial Human Resources Development Programme” will strengthen research and development functions of the livestock sector and reinforce the existing vocational training centre.

9.3 Social Development Strategy and Programmes

The following five Programmes have been prepared for the social development strategy.

Programmes for the Social Development Strategy



1) The “Health and Medical Improvement Programme” aims to improve the health conditions of people through improving facilities, human resource development and disease control. 2) The “Education Improvement Programme” aims to improve the education level of the Malakal people through reinforcing education infrastructure, training of teachers and improved management of education administration. 3) The “Social Safety Net Programme” aims to establish a social safety net in various ways for socially vulnerable groups, targeting returnees, street children, women and others. 4) The “Culture and Sports Promotion Programme” will provide venues for cultural and sports activities for Malakal citizens. 5) The “Participatory Development Promotion Programme” will promote the application of participatory development methodology in government projects through cross-sectoral capacity development for government officers and training of community development officers of the State Ministry of Gender and

Social Welfare.

9.4 Peacebuilding and Governance Strengthening Strategy and Programmes

The following three Programmes are proposed for the peacebuilding/governance strengthening strategy.

Programmes for the Peacebuilding/Governance Strengthening Strategy



1 The “Conflict Mitigation Programme” comprises of cross-sectoral conflict prevention measures and security control strengthened by police reinforcement. 2 The “Individual Capacity Development Programme” aims to develop the skills of government officers across common themes from different sectors. Individual capacity development projects specific to each area are included in each sector. 3 The “Organizational, Institutional and Social Capacity Development Programme” includes land management system strengthening and urban management as the major themes.

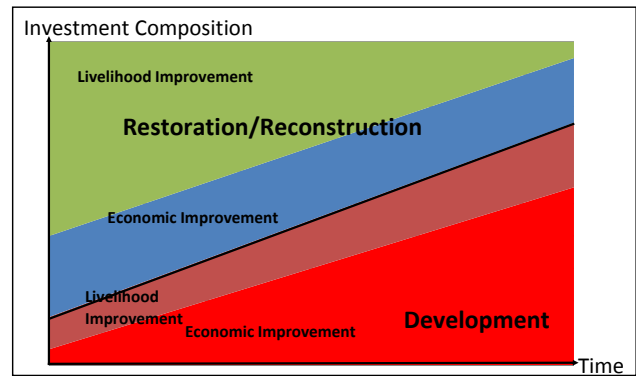
10. INVESTMENT PLAN AND OPERATION/ MAINTENANCE EXPENDITURE PLAN

10.1 Programming of the Proposed Project

Proposed projects under Programmes were evaluated in terms of urgency, economic impacts, population that would benefit, maturity, degree of socio-environmental consideration and relevance to other projects under budgetary constraints, and incorporated in a comprehensive social economic infrastructure.

There are 32 projects under eight infrastructure development programmes in Malakal, 22 projects under four region-wide economic development programmes , 22 projects under five social development programmes, and five projects under three peacebuilding and governance strengthening programmes. The total number of projects is 81.

Table 10-1 lists the proposed projects with investment costs where estimates were possible, the status of technical or financial assistance, and priorities.



Source: JICA Project Team

Figure 10-1 Concept of Development Stage

10.2 Prioritization of Projects

The prioritization of the projects was undertaken based on these considerations and applying a set of criteria in terms of “urgency”, “economic impact”, “benefiting population”, “maturity”, “necessity for socio-environmental consideration” and “relevance to other projects”, with reference to needs assessment and determination of emphasis to be placed at each stage of development up to the year 2022.

Development stages were divided into two stages to determine which issues should be emphasized out of several needs: (a) the recovery and rehabilitation phase and (b) the development phase.

The emphasis in the restoration and rehabilitation stage should be placed on immediate needs of people such as water supply, health care services, needs of returnees (land allotment, housing, etc.), as well as on the recovery of economic activities such as through rehabilitation of the river port.

The reconstruction stage is a transition period from the restoration/rehabilitation stage to the development stage. At the same time, it can also be regarded as the preparation stage for the coming development stage, which will produce a region-wide transportation system and improvement of the investment climate. Once the development stage has been reached, more resources need to be allocated to the relevant projects, such as an industrial park in Malakal and production activities in primary industry in the surrounding areas.

Table 10-1 List of Projects of the Comprehensive Plan (1/3)

P: Priority Project, C: Priority Project and Committed for Implementation (by ROSS or JICA)

Project	Contents	Cost (million USD)				Priority
		Urgent2 012-14	Short 2015-18	Medium 2019-22	Total	
1 Malakal Infrastructure Improvement Strategy						
1.1 Water Supply Programme						
WS-1 Small-scale Water Supply Development Project	Scheme 1: 4 water tank trucks, water purification plant (60m ³), 12public water taps, 9 elevated water tanks; Scheme 2: water purification (common: 71m ³), public faucet, distribution pipe, 2013-2014 (Urgent Development Project)	2.20	0.00	0.00	2.20	C
WS-2 Rehabilitation Project of the Treatment Plant & Distribution Pipe Network	Rehabilitation of the existing water purification plant (15,000m ³), replace of the distribution pipe 55km, installation of elevated water tank, 2013-2019	10.63	29.64	7.73	48.00	C
WS-3 Technical Cooperation Project on Improvement of Water Supply Service	Technical project for improving rate of non-revenue water, and O&M of the facilities, 2013 - 2016				TA	
WS-4 Expansion of the Treatment Plant and Distribution Pipe Network Project	Extension of the existing water purification plant (5,000m ³), replace of the distribution pipe 50km, installation of elevated water tank, 2020 - 2022	0.00	0.00	20.60	20.60	
Sub-Total		12.83	29.64	28.33	70.80	
1.2 Road Improvement Programme						
RT-1 Community Road Construction Project (LBT)	Construction of community road by LBT (Urgent Development Project) ,J-06 (2,070m), J-13(2,150m), J-16(1,280m), 2013-2014	2.00	0.00	0.00	2.00	C
RT-2 Malakal Town Secondary Arterial Road Improvement Project	Improvement of secondary arterial roads by mechanized construction, length 18km, 2014 - 2016	4.50	9.00	0.00	13.50	P
RT-3 Malakal Town Arterial Road Improvement Project	Improvement of arterial roads by mechanized construction, length 45km, 2015-2019	0.00	53.33	6.67	60.00	
RT-4 Road Maintenance & Management Project	Technical project for road maintenance including procurement of equipment, 2014-2015				TA	
RT-8 Intersection and Traffic Facility Improvement Project	Construction of roundabout, installation of sidewalk & zebra crossing, etc, 2017 - 2018	0.00	2.00	0.00	2.00	
Sub-Total		6.50	64.33	6.67	77.50	
1.3 Public Transportation and Traffic Safety Programme						
RT-5 Public Transport Management Project	Technical project for public transport management including establishment of the department for public transport management, 2017 - 2018				TA	
RT-6 Malakal Town Bus Terminal and Bus Stop Facilities Construction Project	Construction of bus terminal and taxi bay, 2016 - 2017	0.00	2.20	0.00	2.20	
RT-7 Traffic Management Project	Technical project for capacity development for traffic management in response to road infrastructure improvement (including intallment of traffic signs), 2014-2016				TA	P
RT-9 Malakal Town Traffic Safety Management Project	Dissemination of traffic education, campaign for road safety, 2019 -2021				TA	
Sub-Total		0.00	2.20	0.00	2.20	
1.4 Sanitation Improvement Programme						
SS-1 Community Sanitary System and Public Toilet Installation Project	Installation of 231 public toilets, procurement of 18 vacuum cars, 2013 - 2022	2.28	4.56	4.56	11.40	P
SS-2 Construction of Sludge Treatment Facilities Project	Wastewater sludge treatment facilities using oxidation pond method (150m ³ /day), 2014 - 2021	0.43	1.70	1.28	3.40	P
SS-3 Technical Project for Toilet Operation and Maintenance	Technical project for maintenance of public toilets, including hygiene education				TA	
SS-4 Project for Improving Sanitary Environment in Malakal Town	Deployment of public health workers in public health centers, holding community health meeting, immunization and preventive health care, etc, 2014 -2020				TA	
SS-5 Public Toilet Operation and Maintenance Project	Hygiene education, establishment of community public toilet maintenance committee, accounting capability development, etc, 2018 -2022				TA	
Sub-Total		2.71	6.26	5.84	14.80	
1.5 Drainage Improvement Programme						
WD-1 Reconstruction of Main Drains in Central Malakal Project	Reconstruction of 5 major drains in central Malakal, gradient 0.1 - 0.2%, installation of pipe culvert at intersections, 2014 - 2015	2.10	2.10	0.00	4.20	P
WD-2 Reconstruction of Main Drains Project	Reconstruction of other 4 major drains in central Malakal, grade 0.1 - 0.2%, installation of pipe culvert at intersection, 2014 - 2016	1.17	2.33	0.00	3.50	
WD-3 Extension of Trunk Drain 1 Project	Extension of drains in ther southern Malakal, 2014 - 2015	3.50	3.50	0.00	7.00	
WD-4 Construction of Trunk Drain 2 Project	Construction of drains along the Ring road 2016-2018	0.00	10.70	0.00	10.70	
WD-5 Construction of Main Drains in New Urban Area Project	Construction of major drains in new development area of Malakal, 2018-2022	0.00	0.70	2.80	3.50	
WD-6 Capacity Development Project for Operation and Maintenance of Drains	Capacity development for officials in charge of drainage in MPI&RD, mainteance activity by community, procurement of equipment, 2015-2016				TA	
Sub-Total		6.77	19.33	2.80	28.90	
1.6 Solid Waste Management Programme						
SM-1 Solid Waste Collection Activities Improvement Project	Procurement of 6 solid waste collection cars, establishment of 73 solid waste collection sites, and human resource development, 2014 - 2017				TA	P
SM-2 Landfill Management Improvement Project	Improvement of landfill (recycle area, drainage, weigh station, fence, office, etc), 2014 - 2016	0.90	1.80	0.00	2.70	
SM-3 Medical Waste Management Improvement Project	Project for establishing independent treatment system for medical solid waste, 2015 - 2017	0.00	2.00	0.00	2.00	
Sub-Total		0.90	3.80	0.00	4.70	

Source: JICA Project Team

Table 10-1 List of Projects of the Comprehensive Plan (2/3)

P: Priority Project, C: Priority Project and Committed for Implementation (by ROSS or JICA)

Project	Contents	Cost (million USD)				Priority
		Urgent2 012-14	Short 2015-18	Medium 2019-22	Total	
1.7 Power Supply Programme						
EN-1 Power Plant Rehabilitation Project	3 DEG being installed for peak load, diesel generator (2.5MWx4) to be installed for base load, (construction of power plant building, fuel storage facilities (600m ³ x2), 2014-2018	4.00	16.00	0.00	20.00	P
EN-2 Expansion of 11kV Distribution Network Project	Expansion of 11kV distribution network in the northern and southern areas, 2017-2019	0.00	0.67	0.33	1.00	
EN-3 Solar Power Pilot Project	Installation of solar power street light for reducing the burden of DEG by alternative energy supply and improving security during night time, 2014-2016	0.33	0.67	0.00	1.00	
Sub-Total		4.33	17.33	0.33	22.00	
1.8 Emergency Service Reinforcement Programme						
ES-1 Firefighting System Improvement Project	Procurement of equipment and human resource development for firefighting				TA	
ES-2 Project for Improving Support System for Emergency Medical Service	Procurement of equipment (ambulances) and human resource development for emergency medical service support system				TA	
Sub-Total		0.00	0.00	0.00	0.00	
Total of Malakal Infrastructure Developmet Strategy		34.03	142.90	43.97	220.90	
2 Region-wide Economic Development Strategy						
2.1 Region-wide Transportation and Logistic Development						
EC-1 International Transport Corridor Establishment Project	Development of international all-weather road network including between Malakal and Ethiopia, and between Malakal and Kenya.			n.a.		C
EC-2 Malakal Airport Internationalization Project	Planned in 2006: i) fence construction, ii) extension of the runway by 1km, iii) expansion of the airplane parking area (100m x 100m), iv) reconstruction of control tower and passenger building			n.a.		
EC-3 Malakal Rural Road Network Improvement Project	Improvement of road network connecting local areas of UNS and Malakal, Deleib - Fadit - Panyikang, Melut - Malakal, and Maban - Tonga - Oriny			n.a.		P
PT-1 Reconstruction of Jetty at Malakal Port Project	Construction of cargo jetty (20m x 10m) at present port and improvement of apron (Urgent Support Project) 2013-2014.	2.00	0.00	0.00	2.00	C
PT-2 Procurement of Crane Project	Procurement of mobile crane (40-50t) 2014	0.75	0.00	0.00	0.75	P
PT-3 Construction of New Port Project (Phase 1)	Construction of a new port for cargo container transportation (35m wharf), 2014-2015	1.50	1.50	0.00	3.00	P
PT-4 Construction of New Port Project (Phase 2)	Construction of a new port for cargo container transportation (extension to 300m wharf), warehouse, administration building, and access road construction, 2016-2018	0.00	21.00	0.00	21.00	
PT-5 Construction of Passenger Jetty Project	Construction of passenger jetty at present port and improvement of apron (Urgent Support Project) 2013-2014	0.60	0.00	0.00	0.60	C
PT-6 Development of West Side (Left Bank) of River Nile Project	Construction of floating pier in Lolo Area (opposit side of existing Malakal port) 2017-2018	0.00	0.50	0.00	0.50	
PT-7 Improvement of Malakal Port Project	Improvement of facilities in the existing port for passengers, fishermen and tourists 2017-2018	0.00	1.50	0.00	1.50	
PT-8 Procurement of Ferry Project	Procurement of ferries for passengers and vehicles transport, 2019	0.00	0.00	6.00	6.00	
PT-9 Improvement of River Bank Protection Project	Improvement of river bank protection at the present existing port, 2020-2021	0.00	0.00	0.15	0.15	
PT-10 Improvement of New Port Road Project	Construction of access road to the new port, 2014-2015	0.30	0.30	0.00	0.60	P
PT-11 Port Management Capacity Development Project	Technical project for port management, statistical data preparation, and security management, 2013-2015				TA	C/P
Sub-Total		5.15	24.80	6.15	36.10	
2.2 Primary Industry Development Programme						
EC-4 Upper Nile Fisheries Project	MARF human resource development, improvement for fishery port, and provision of fishing equipment for increasing fish catch, 2014-2018	0.10	0.38	0.00	0.48	P
EC-5 Malakal Dairy Farm Project	Human resource development for MARF, dairy farmers, and UN University and provision of machine and equipment, 2014-2018	0.96	3.84	0.00	4.80	
EC-6 Malakal Poultry Breeding Farm Project	Construction of large scale poultry breeding facilities, 2014-2018	0.10	0.40	0.00	0.50	
EC-7 Malakal Slaughter House Construction Project	Relocation of slaughter house to southern part of Malakal Town				TA	P
Sub-Total		1.16	4.62	0.00	5.78	
2.3 Investment Climate Development Programme						
EC-8 Malakal Light Industrial Park Development Project	Development of light industrial park in the northern Malakal (industrial cluster assumed, converting from government-led to private-led development) 2015-2018	0.00	10.00	0.00	10.00	
EC-9 Logistics Hub Development Project	Logistic hub development for cargo container transport for international traffic network, local road, airline, river in the southern Malakal, 2019-2021	0.00	0.00	10.00	10.00	P
Sub-Total		0.00	10.00	10.00	20.00	
2.4 Research and Industrial Human Resource Development Programme						
EC-10 Research Function and Support Services Development Project	Relization of "Policy Framework and Strategic Plans 2012 - 2016"				TA	
EC-11 Malakal Vocational Training Center Reinforcement Project	Programmes related to industrial development in Malakal and neighboring areas, and provision of equipment				TA	C
Sub-Total		0.00	0.00	0.00	0.00	
Total of Region-wide Economic Developmet Strategy		6.31	39.42	16.15	61.88	

Source: JICA Project Team

Source: JICA Project Team

Table 10-1 List of Projects of the Comprehensive Plan (3/3)

P: Priority Project, C: Priority Project and Committed for Implementation (by ROSS or JICA)

Project	Contents	Cost (million USD)				Priority
		Urgent2 012-14	Short 2015-18	Medium 2019-22	Total	
3 Social Development Strategy						
3.1 Health and Medical Improvement Programme						
HE-1	Primary Health Care Center Construction Project	Construction of 3 primary health care centers in the northern, central and southern areas, and procurement of equipment, 2017-2019	0.00	5.40	2.70	8.10
HE-2	Malakal Teaching Hospital Health Infrastructure Improvement Project	Enhancement of facilities for Malakal Teaching Hospital, procurement of ambulances, introduction of water and power supply system, 2015-2016	0.00	12.00	0.00	12.00
HE-3	Health Service Capacity of 4 Major Health Centers Upgrade Project	Increase of beds for 4 major public health centers (Sora Malakia, Assosa, Luakat, Bum), improvement of water and power supply, 2016-2017	0.00	8.40	0.00	8.40
HE-4	Revitalisation of Medical/Health Faculty in UNU Project	Securing human resource, procurement of equipment, and improvement of facilities for reconstruction of UNU Faculty of Medicine & Public Health, 2015 - 2016	0.00	11.50	0.00	11.50
HE-5	Urban Malaria Control Programme	Promotion of mosquit nets, antiseptic of ditch, human resource development (for community cooperation), etc, 2014-2017		Operational		C
HE-6	EPI (DPT3, Measles) Vaccination Promotion Project	Immunization for DPT3, Measles and the like, campaign, establishment of cold chain, etc, 2014 - 2016				TA P
HE-7	Human Resources Development for Maternal and Child Health Project	Education and training for nurses and midwives, 2015 - 2019				TA
	Sub-Total		0.00	37.30	2.70	40.00
3.2 Education Improvement Programme						
ED-1	Primary School Establishment and Renovation Project	Construction of 4 new primary schools, improvement of the existing primary schools, 2013-2016	1.03	1.03	0.00	2.05
ED-2	Strengthening Mathematics and Science Education Project	Technical project for mathematics and science education for teachers of the primary schools in UNS, 2013-2016				TA C
ED-3	Capacity Building of MoE Project	Technical project for school management for UNS Ministry of Education, 2014-2015				TA
ED-4	Malakal Teachers's Training School Construction and Renovation Project	Construction of Teachers Training Dormitory that was used for SAF dormitory during civil war, and renovation of water supply facilities. Assuming 600 students, and 45 teachers 2019-2020	0.00	0.00	11.00	11.00
ED-5	Malakal Teachers's Dormitory Reconstruction Project	Construction of teachers' dormitories in 10 sites (100 teachers targeted) 2021-2022	0.00	0.00	3.80	3.80
ED-6	Malakal Primary School Construction Project	Construction of 8 primary schools 2016-2018	0.00	7.10	0.00	7.10
ED-7	Malakal Middle School Construction Project	Construction of 4 middle schools 2016-2018	0.00	10.80	0.00	10.80
	Sub-Total		1.03	18.93	14.80	34.75
3.3 Social Safety Net Programme						
SW-1	BHN for Returnees Project	BHN infrastructure improvement in residential areas of returnees for community development, geared with land use zoning 2014-2015	2.50	2.50	0.00	5.00
SW-2	Malakal Street Children Center Renovation Project	Renovation of street children center with poor sanitation and insufficient facilities, 2014-2015	0.20	0.20	0.00	0.40
SW-3	MOGSW Speed Boat Project	Securing means of transportation for improving government service of Ministry of Gender and Social Welfare and Religious Affairs, 2014-2015	0.01	0.01	0.00	0.02
SW-4	Malakal Reformatory Center Establishment Project	Construction of juvenile reformatory facilities, 2014-2015	0.53	0.53	0.00	1.05
SW-6	Malakal Town Women's Group Community Empowerment Project	Vocational training for women in the southern and eastern areas in Malakal for women empowerment				TA P
	Sub-Total		3.24	3.24	0.00	6.47
3.4 Culture and Sports Promotion Programme						
SW-5	Upper Nile Culture Center Project	Construction of culture center where events that value tradition and culture are to be held. 2021-2022	0.00	0.00	3.00	3.00
	Sub-Total		0.00	0.00	3.00	3.00
3.5 Participatory Development Promotion Programme						
PD-1	Participatory Development Planning System Establishment Project	Human resource development for UNS officials on participatory development planning and pilot project implementation, 2015-2017				TA
PD-2	Human Resource Development for Community Development Officer (CDO) Project	Capacity development for CDOs on planning, implementation, and evaluation, 2015-2020				TA P
	Sub-Total		0.00	0.00	0.00	0.00
	Total of Social Development Strategy		4.26	59.46	20.50	84.23
4 Peace Building/Governance Enhancement Strategy						
4.1 Conflict Mitigation Programme						
-	Measures for Conflict Prevention (included in every sector)	Service provision, employment of labor, consensus building among tribes, appropriate countermeasure for land issue(s), decrease of economic impartiality, departure from nepotism, etc.	-	-	-	C
ID-1	Police Box and Community Police System Establishment Project	Establishment of police box and community police system linked with government police HQ 2015-2017				TA
	Sub-Total		0.00	0.00	0.00	0.00
4.2 Individual Capacity Development Programme						
CD-1	Local Government Administration Improvement Project	Capacity development for planning, budget implementation and management, coordination with other sector departments, 2014- 2020				TA
CD-2	Cost Recovery System Improvement Project	Technical project for cost recovery system through controlling cost and increasing service revenue of the administration for public services				TA
	Sub-Total		0.00	0.00	0.00	0.00
4.3 Organization/Institution/Social Capacity Development Programme						
ID-2	Malakal-Juba Urban Management System Project	Monitoring of implementation progress of Malakal and Juba urban infrastructure M/P supported by JICA, and human resource development (law, land registration, detailed planning, participatory development, social research, GIS, etc), 2014 -2016				TA P
ID-3	Land Registration System Improvement Project	Mechanization and computerization of land registration, computer data base establishment, human resource development for land registration, use of JICA prepared topographic maps, 2017-2019				TA P
	Sub-Total		0.00	0.00	0.00	0.00
	Total of Peace Building/Governance Enhancement Strategy		0.00	0.00	0.00	0.00
	Grand Total		44.60	241.79	80.62	367.01

Source: JICA Project Team

10.3 Investment Plan and Operations/Maintenance Expenditure Plan

An investment plan and an operations/maintenance expenditure plan for the projects were prepared based on the implementation schedule as summarized in **Table 10-2**.

Table 10-2 Budget Requirements

Budget Item	Urgent-Term (2012-14)	Short-term (2015-18)	Med.-term (2019-22)	Comprehensive Plan (2012-22)
Currency	USD (Millions)	USD (Millions)	USD (Millions)	USD (Millions)
Number of Project	6	47	28	81
Capital Cost				
Total Amount Required	44.60	241.79	80.62	367.01
Government Allocation	40.00	53.00	53.00	146.00
Gap (amount required)	(4.60)	(188.79)	(27.62)	(221.01)
Operation & Maintenance Cost				
Total Amount Required	0.23	19.83	93.66	113.72
Government Allocation	56.00	75.00	75.00	206.00
Gap (amount required)	55.77	55.17	(18.66)	92.28

Note: Number of projects is completed project number within the term.

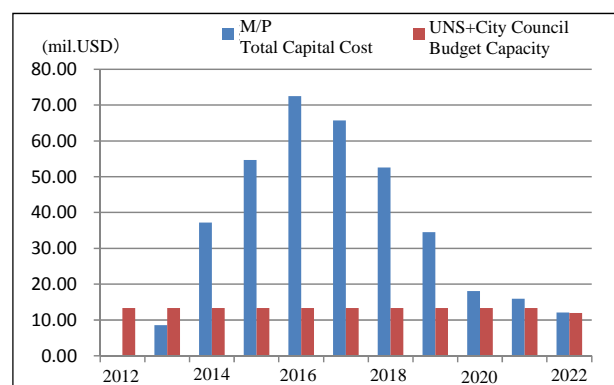
Source: JICA Project Team

11. DIRECTIONS FOR FUNDS MOBILIZATION FOR IMPLEMENTATION AND OPERATIONS

The graphs below compare the funds required and those that are actually available for the implementation and operation of the projects. The blue bars indicate the funds required. The graph on the left shows investment and the one on the right shows operations. The red bars show the actual expenditures by the Upper Nile State and Malakal Town for investment and operations in 2011. The graph on the left shows that the funds required for investment far exceed the locally available funds between 2013 and 2021. Assistance from international organizations and donors will therefore be indispensable. The graph on the right indicates that the funds required for operations will begin to exceed the locally available funds around 2019 when many of the proposed projects enter into operation. It will become necessary to expand the application of the beneficiary-to-pay principle so that the operations and maintenance budget can be secured within each project. In the event that investments in infrastructure proceed with international assistance without the introduction of the beneficiary-to-pay principle as an initiative of the Upper Nile State government, there will be a risk of many infrastructure facilities due to insufficient budget for proper maintenance.

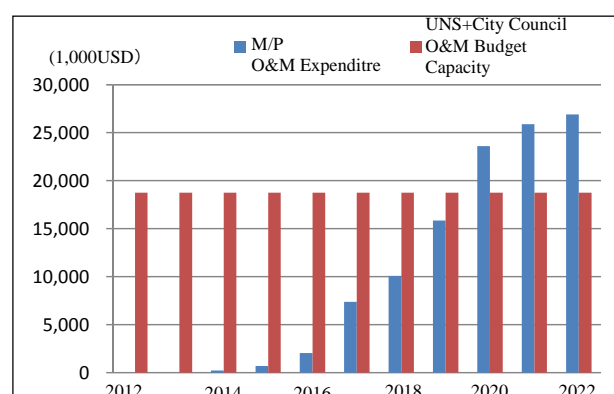
This situation should definitely be avoided. A multi-faceted approach would be needed to establish a

sustainable operations and maintenance system for infrastructure facilities, including the establishment of the beneficiary-to-pay system, technical capacity development in operations and maintenance, and livelihood development to enhance people's capacity to bear social service costs.



Source: JICA Project Team

Figure 11-1 Annual Investment Plan



Source: JICA Project Team

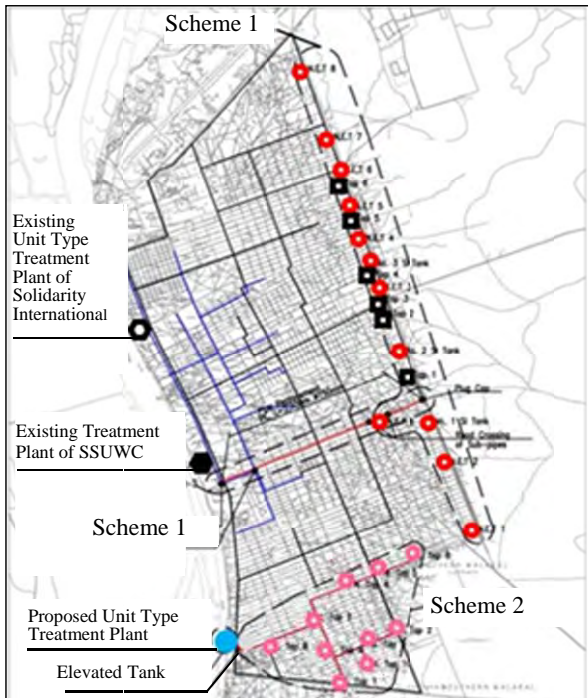
Figure 11-2 Annual Operations and Maintenance Costs

<Part V>
URGENT DEVELOPMENT PROJECTS

Three projects in the areas of water supply, community roads, and port facilities were assessed as highly urgent and are being implemented within the present project. They commenced in 2013, however were terminated before completion due to the outbreak of civil war in December 2013.

12. WS-1 SMALL-SCALE WATER SUPPLY DEVELOPMENT PROJECT

The Town Profile Survey clarified that people in the town identified the need for water as outstandingly high out all identified needs.



Legend	
● Proposed New Small-Scale Elevated Tanks with Public Taps	— Proposed Pipelines to be Developed
○ Proposed Public Taps	— Pipelines Replaced by SSUWC
■ Existing Public Taps of SSUWC	— Not Replaced Pipelines

Figure 12-1 Location of Urgent Development Project in Water Supply Sector

Operation and Management. The small-scale water supply facilities belong to SSUWC. In order to operate and maintain water supply facilities in the Project, two related sections are to be established within SSUWC-Malakal. The public water taps will be managed by water committees created by beneficiary communities. It is planned that this system will begin to operate in 2014 in the eastern and southern parts of

Malakal Town where the water supply service has not been able to keep pace with the rapid population increase in recent years.

Table 12-1 Components of Urgent Development Project in the Water Supply Sector

Item	Description
Scheme 1	
Target	Eastern Zones in Malakal Town
Facilities to be constructed	Unit Type Treatment Plant*
	Twelve (12) small-scale storage tanks
	Twelve (12) public taps
Equipment to be provided	Three (3) water trucks
Clean water transmission facility	Water truck
Water supply equipment	Public taps
Scheme 2	
Target	Southern Zone in Malakal Town
Facilities to be constructed	Unit Type Treatment Plant*
	One (1) elevated tank
	Ten (10) public taps
Clear water transmission facility	Water pipelines
	Pipeline
Water supply equipment	Public taps

Note: * One unit type treatment plant will be installed in the southern zone and utilized for both scheme 1 and 2.

Source: JICA Project Team

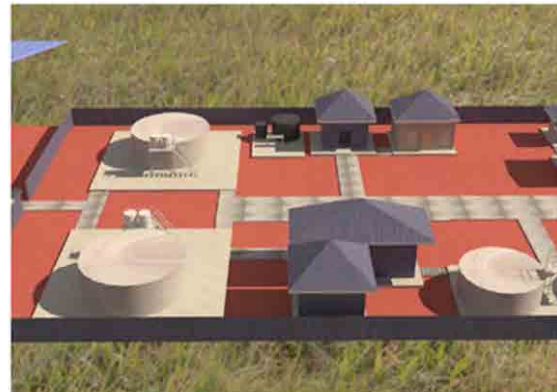


Figure 12-2 3D Drawings of Water Treatment Plant

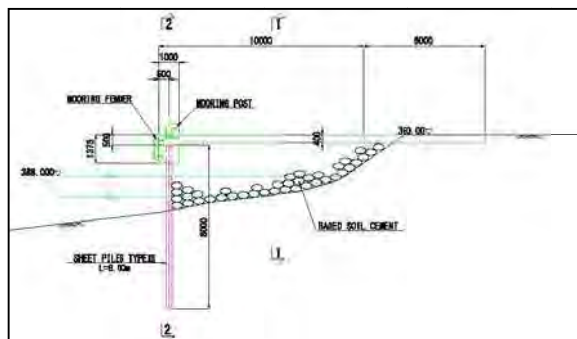
13. PT-1 RECONSTRUCTION OF JETTY AT MALAKAL PORT PROJECT AND PT-5 CONSTRUCTION OF PASSENGER JETTY PROJECT

The “PT-1 Reconstruction of Jetty at Malakal Port Project” and “PT-5 Construction of Passenger Jetty Project” were selected as part of the economic development strategy. The project site is located at the present Malakal Port. This project aims to reduce transportation costs by improving loading and unloading efficiency, thus enhancing the cargo handling capacity as well as improving convenience for passengers who cross the Nile River.

The Town Profile Survey revealed that 35% of the respondents use boats as a primary means of transportation to cross the Nile River (multiple answers allowed). The project includes construction of a 20 m x 10 m cargo jetty, improvement of the apron, construction of four passenger piers and improvement of the embankment.



Figure 13-1 Bird’s Eye View of Project Site (Cargo Jetty)

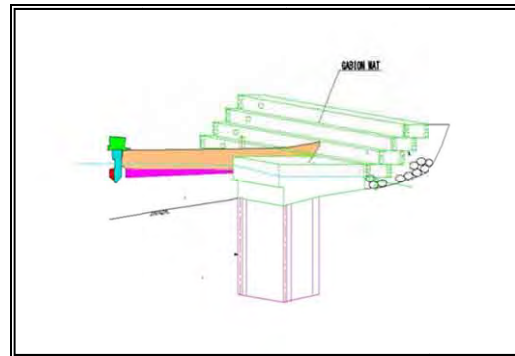


Source: JICA Project Team

Figure 13-2 Structure of Jetty

It is important to implement a system that allows for the efficient identification of faults of the facilities, rational

assessment of conditions, and efficient conduct of repairs/strengthening to maintain port facilities.



Source: JICA Project Team

Figure 13-3 Outline Drawing of Passenger Jetty

Table 13-1 Contents of Urgent Development Project in Water Transport Sector

Item	Description
Jetty for Barges	
Target	Malakal River Port
Type	Steel sheet pile jetty with four (4) mooring bitts and rubber fenders
Capacity	Four (4) barges can be moored at the same time
Jetty for Passengers	
Target	Malakal River Port
Type	Jetty with Eight (8) mooring bitts
Capacity	Eight (8) boats can be moored at the same time

Source: JICA Project Team

Neither ROSS nor UNS has sufficient budget to cover O&M of the port. O&M costs should be provided through port revenue.

An Operation and Management plan is to be prepared through another JICA technical cooperation project, “The Project for Enhancement of Operation and Management Capacity of Inland Waterways in South Sudan” (It is currently unknown if this project will be continued or not.)



Source: JICA Project Team

Photo Earth Breaking

14. RT-1 COMMUNITY ROAD CONSTRUCTION PROJECT (LBT)

According to the Town Profile Survey results, about two thirds of people are dissatisfied with present road conditions, citing muddy conditions during the rainy season as the primary problem.

The “RT-1 Community Road Construction Project (LBT)” commenced as part of this Project. The initial application of the LBT method endeavoured to reveal the cost advantage of LBT compared with machine-based technology (MBT) and the economic impacts on the local economy through payment of wages to labourers. The target community roads are J-06 for 2,067 m, J-13 for 2,150 m and J-16 for 1,280 m, with a total length of 5.5 km. The unique characteristic of this project is the application of LBT on a pilot basis.



Source: JICA Project Team

Figure 14-1 Location of the Urgent Development Project in the Road Sector

Technical transfer by the JICA Project Team began so that the Department of Roads and Bridges will be able to undertake road works applying LBT on their own in the future.

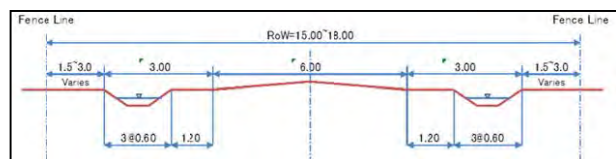
It was proposed that the O&M Section should be organized under the Department of Roads and Bridges, MPI&RD, and that Malakal Vocational Centre should be involved in routine maintenance work to create further

job opportunities.

Table 14-1 Contents of Urgent Development Project in Road Transport Sector

Item	Description
Target	Community Roads in Malakal Town
Length	Up to “5.5km” in total
Width	“6.0m-wide” carriageway at middle of right of way with “1.8m-wide” side ditch at both sides
Construction Method	Labour Based Technology (LBT)
Improvement Type / Pavement Structure	Resurfacing with; <ul style="list-style-type: none"> - Binder course of soil sacks filled up with “black cotton soil (BCS)” in-situ - Wearing surface of BCS with lime treatment - Top surface with crushed bricks

Source: JICA Project Team



Source: JICA Project Team

Figure 14-2 Standard Cross Section



Diagonal Herringbone Layout of Sacks

Spreading Sub Base-Course



OJT on Site

Inspection (Thickness)

Though LBT-III Lot has already been completed, LBT-I and LBT-II Lots were terminated. The remaining work length totals 1.8 km.

<Part VI>
RECOMMENDATIONS

15. RECOMMENDATIONS

Recommendations were made for the formation of a social economic infrastructure plan and the implementation of Urgent Development projects in the planning, implementation, and operation and management phases of this Project.

15.1 PLANNING SYSTEM

(1) Formation organizations/agencies to implement the comprehensive plan

Consensus building and mutual adjustment will be indispensable in the planning process of large-scale development plans to ensure effective allocation of budgets by sector, and the timely implementation of components in order to realize the vision.

In this Project, working meetings consisting of MPI&RD staff and relevant organizations were organised continually, which helped the Project team through each working process. Thus it is recommended that formation of organization, in timely manner, beyond the sectors with legally endowed roles to assure comprehensive approach.

(2) Authorization of the Comprehensive Plan and Incorporation into National/Regional Development Plans

It is essential for the social and economic infrastructure plan formulated under this Project to be authorized as a comprehensive plan for short and medium terms leading up to the year 2022. This will systematically encourage the reconstruction and development of Malakal Town so that it may function as the core of the Upper Nile Region, with a high level of integration and aligned targets and direction.

The authorized development plan comprising of projects and land use zoning is to have the power to guide all development activities and investments by both the public and private sectors.

(3) Amendment of the Plan to Adjust to Situational Changes

The plan is to be reviewed on occasion and adjusted according to change in social and economic conditions in the future.

This project was initiated to restore and reconstruct social economic infrastructure in Malakal Town that was damaged and dilapidated during the long-lasting internal war. Therefore the underlying basis for formulating the comprehensive plan remains stable even after internal strife occurred in December 2013. However, the urgency and priority of improvement measures for emergency medical services, measures for securing essential foodstuffs, etc., are affected.

Malakal Town is expected to develop beyond its boundaries and transform itself into a core town in the Upper Nile Region. In this regard, it is desirable for the social economic infrastructure plan for Malakal Town to also cover surrounding areas, especially the western bank of the Nile River on the opposite side of the existing Malakal Town.

(4) Promotion of Capacity Building

It is recommendable that government staff positively participate in donor/international organization funded projects to enhance their capacities. It is also recommended to conduct capacity building projects on management of private sector activities as a more positive approach.

(5) Timely Conduct of Feasibility Studies

The details of the projects are to be determined through feasibility studies or basic design, including the project scope, construction method and schedule, cost, and if necessary, technical/economical/financial/environmental analyses. It is necessary to conduct a feasibility study or basic design for the proposed projects to materialize as scheduled.

15.2 IMPLEMENTATION

(1) Securing/Raising of Funds

Realization of a social economic infrastructure plan requires a huge quantity of funding. Various measures for raising funds are to be examined and introduced including promotion of private sector investment, increases in tax revenue based on the beneficiary-to-pay principle, utilization of communities' resources, and so on.

Private sector investment in the form of PPPs or other similar schemes and sole private sector participation should be promoted for the projects expected to gain

revenue such as those related to power supply, water supply and sewerage service. To this end, it is vital to improve the environment for investment, including through market development, taxation preference policy, development of related infrastructure, and so on.

It is worthwhile examining and introducing policies such as beneficiary pays and pay for damage and wear and a restructure of fee and taxation systems for public services. This will act to secure funds for operations, management and maintenance.

Since in Malakal people are generally not well aware of the beneficiary-pay principle for public services due to the past customary access thereto, the principle should be carefully introduced. It is recommended that local resources, such as water, land suitable for farming and livestock, are utilized effectively.

This is effective in minimising expenditure as well as in redistributing wealth.

(2) Adoption of Labour-based Construction for Job Creation

Since job opportunities are currently very limited in Malakal except in the government sector, job creation is of vital importance. This is especially true for returnees, who are expected to increase in number.

One of the practical ways to absorb unemployment is through the construction industry in Malakal. In general, the labour-based construction method is more applicable to small-scale projects. It is recommended that measures are taken to encourage the adoption of the labour-based construction method.

(3) Promotion of Local Construction Industries

Promotion of the local construction industry is important for the social and economic development of the area. This may have multiple effects such as activation of the local economy and creation of employment opportunities.

The following government interventions are desirable:

- Establishment of a construction equipment lease market system
- Provision of bond facilities to locally based enterprises of small to medium size
- Establishment of a financing system for locally based enterprises
- Provision of skills training and establishment of an

official qualification system for special technicians, mechanics, equipment operators, etc.

- Introduction of tenders giving preference or limiting to locally based enterprises (or joint ventures with foreign firms). This is a practical way to form joint ventures with foreign firms at first, gradually increasing the role of local firms.

(4) Utilization of Trainees in Capacity Building Courses

Since on-the-job training reinforces acquired skills, trainees graduating from training courses in this Project are to be effectively employed in work requiring the acquired skill. Furthermore, acquired skills are not to remain solely with the graduate of the training course, but are to be transferred as an asset to the section or department through the graduates playing the role of trainer.

15.3 OPERATION AND MANAGEMENT

Adequate maintenance is very important to keep the facilities in good operational conditions and to minimize the life-cycle costs of the facilities.

In the Foreword of the SSDP, it is recommended that the public and private sectors, communities and individual citizens work together to combine their comparative strengths in order to realize the envisaged achievements of the Plan. Following this recommendation, discrete steps for the introduction of private sector participation are to be taken on a project-by-project basis to found efficient operation and maintenance system.