PART II JUBA TOWN DEVELOPMENT PLAN

7. Strategy for Basic Physical & Social Infrastructure Development Plan

(1) Basic Strategy

In the formulation of infrastructure plan, attention was given to followings.

a) Emergency task is to directly reply the basic needs of physical and social infrastructure both for the present communities and new settlement of the returnees.
b) Needs survey at the community level is a fundamental study for preparation of urgent rehabilitation and development programs for basic physical and social infrastructure.
c) The plan is to be prepared as practicable and flexible one by staging the needs and level of services of basic infrastructure.
d) Institution enhancement and capacity building will be carried out through actual planning and construction of the basic infrastructure, at the community, state government and GOSS levels.

Implementation was phased into short (2006-11), medium (2012-15) and long (2016-) terms.

Unpaved Road Condition after Rain

Temporary Tank for Water Selling

(2) Basic Infrastructure Needs

Basic Sectoral Development Goals

Road	
	- Present situation AC paved road network density of 0.2km/sq.km - Goal AC paved arterial and supplementary arterial road network density of 3.5km/sq.km on the average
River Port	
	- Present situation No specific port facilities for boats and barges - Goal Main river port with 70m length pier
Water Supply	
	- Present situation 20 l/day per capita demand - Goal One hundred (100) % of population in Juba can access urban water to meet 100 l/day per capita demand.
SWM	
	- Present situation No collection system is functioning for household SW. - Goal Eighty two (82) % of population in Juba can access improved SWM.
Sewage Management	
	- Present situation Sewage water amount 3,369 cu.m, and no collection - Goal Eighty two (82) % of the population in Juba can access improved Sewage Management.
Education	
	- Present situation 46% of enrolment rate to primary school - Goal One hundred (100) % of eligible population in Juba can access primary education.
Medical & Health Service	
	- Present situation 3.1 bed/1,000 pop. - Goal One hundred (100) % of population in Juba can access basic medical & health services. (3.7 bed/1,000 pop.)

8. Transport Infrastructure Development Plan

(1) Road Network

Followings are stressed in the formulation of road sector projects.

a) Relevance with road projects in ERWJ

b) Roads to correspond to the future urbanization

c) Reinforcement of present road network deficiencies

- All weather road network formation
- Reinforcement of May Street
- Improvement of routes across the River Nile
- Airport connection road
- Accessibility and hierarchical composition improvement of roads in Malakia area
- Road network density improvement in the city centre.
- Reinforcement of circumferential road function
- Bypass way to avoid traffic concentration on Unity Ave.

d) Efficient formation of trunk road network

e) Public transport and NMT improvement

1) Road

Planned roads for urban planning are follows.

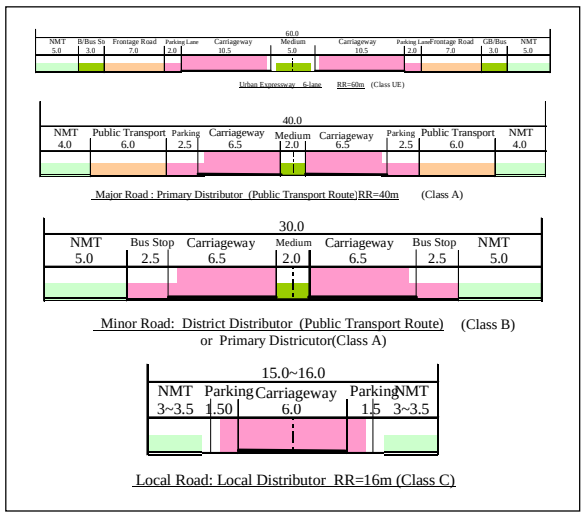
Proposed Road Classification

Road Class	Road Category	Function	ROW
Urban Highway	Urban Expressway	Principle Arterial	60m
Class A	Major Road	Primary Distributor	30~40m
Class B	Minor Road	District Distributor	20~30m
Class C	Local Road	Local Distributor	10~20m
Class D	Local Street	Access Road	6~12m
NMT route	Special Road	Walk/Cycle way	3~5m

Planned roads and projects are shown in following Figures and Table.

2) Nile River Bridge

Projects were proposed to improve the linkage between eastern and western banks of the River Nile including replacement of present temporally bridge to which weight control is applied.



Standard Cross Sections

Temporary Nile Bridge

Road Sector Projects

Projects			Short	Medium
			2006 -2011	2012 -2015
Road Rehabilitation Project (ERWJ)			60km urban roads	
Road Network Development Project, Phase-1				
	Class A (km)	85.5	31.5	54
	Class B (km)	69.4	41.4	28
	Class C (km)	581.5	79.5	502
	NMT (km)	59.9	59.9	0.00
Road Network Development Project, Phase-2				
I	Urban Highway (km)	76.4	0.00	36.2
II	Interchange/Intersection	25	0	17
Nile River Bride Construction		2,700	0	1,700
	B1 (m)	250	250	0
	B2-B6 (m)	2,450	0	2,450

Note: Detailed FS is required.

(2) Public Transport & Terminals

In the planning of public transport terminal, focuses were put on following issues;

- Passenger movement for commuting, business activities and shopping
- Passenger movement among urban functions
- Cooperation between regional and urban public transport movement

Those public transport terminals are located to the nodal points between inner circumferential road and radial trunk road in consideration of covering area of bus service. In the planning of truck terminal, focuses were put on following issues;

- Freight movement between international/regional artery and major industrial areas
- Inter-modal cooperation between road and port/airport

Those truck terminals are located to the nodal points between outer circumferential road and regional artery, port and airport in consideration of prevention of heavy vehicle intrusion to the city center.

An overall public transport and truck terminal construction project is shown in the Figure.

Terminal Development Project

Terminal Construction Project		
(a) Public Transport Terminal Short (2006-2011)		
	No. of berths	Area (sq.m)
Juba Town Bus Terminal	50	7,500
Yei Road Bus Terminal	50	7,500
Airport Bus Terminal	10	1,500
Gumba Bus Terminal	30	4,500
Malakia Bus Terminal	20	3,000
Others (Road side)	10	-
(b) Truck Terminal Medium (2012-2015)		
	No. of berths	Area (sq.m)
Airport North Truck Terminal	5	1,750
Rajaf Truck Terminal	5	1,750
Yei Road Truck Terminal	5	1,750

(3) River Port

River port projects are proposed to meet the future transport demand.

River Transport Demand

Future Demand (2015)	
Cargo To Juba From Juba	Volume 7,100-8,600 tons/month 300-360 tons/month No. of Vessels 24-29 vessels/month
Passenger To Juba From Juba	Volume 780- 950 pass./month 780-950 pass./month No. of Vessels 2-3 vessels/month

Note: Number of vessels is estimated assuming the average load is 300 tons of cargos or 400 passengers.

Port Projects

Projects	Scope
Juba Port Improvement Project (Pilot Project under this Study)	Short (2006-2011) Construction of 35 m pier
Juba Port Expansion Project	Medium (2012-2015) Expansion of pier to 70 m New Port Construction Project
New Port Construction Project	Medium and Long (2012-) New East River Port construction (after 2015, F/S required.)

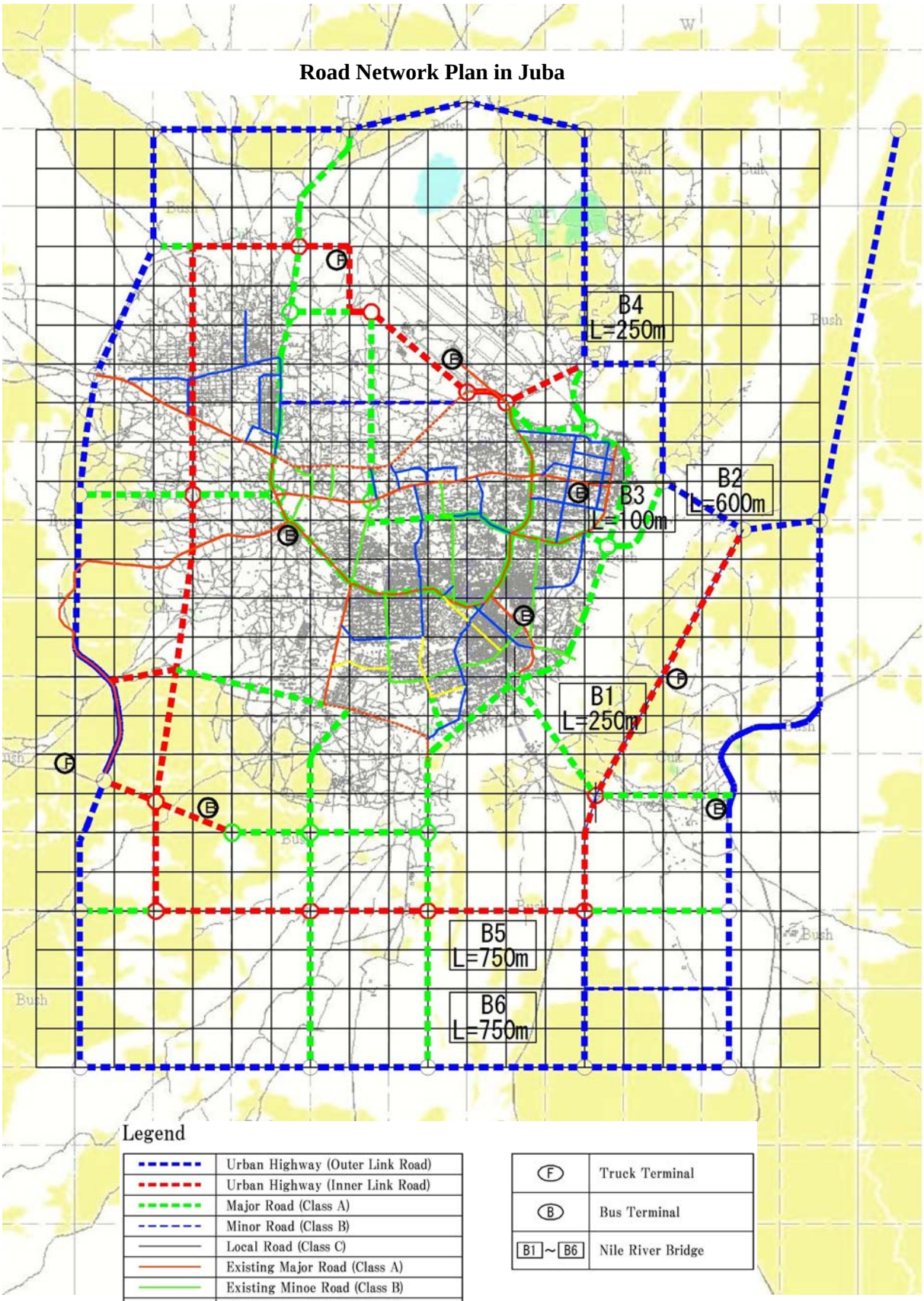
(4) Airport

For the rapid expansion of future demand of air transport at Juba International airport, it is required to improve the airport facilities such as runway, apron, terminal building and air navigational aid facilities. New airport construction shall be studied.

Airport Projects

Projects	Scope
Juba International Airport Rehabilitation Project	Short (2006-2011) ・ Rehabilitation of runway & terminal ・ Construction of protective fence, upgrading of air navigation aid system, etc.
Juba International Airport Development Project	Short and Medium (2006-2015) ・ Extension of runway to 3,000m ・ Improvement of terminal building and control tower
New Juba International Airport Construction Project	Medium and Long (2012-) New Airport construction (F/S required.)

Road Network Plan in Juba



Proposed Road Network and Terminal (2015)

9. Utilities Development Plan

(1)Water Supply Development Plan

1) Present Water Supply Condition

Present Waterworks

Public water supply system were constructed in 1937 and have deteriorated due to insufficient maintenance since two times of rehabilitation. Due to a large quantity of leakage and blockage of pipe lines, only 20% to 30% of the original capacity still functions.

The Urban Water Corporation, responsible for control over the water supply system, cannot cope with its operation and maintenance in a prompt and flexible manner due to insufficient human resources and equipment.

GOSS is implementing the Emergency Rehabilitation Project.

Wells with Manual Pumps

365 deep wells with manual pumps have been developed mainly in urban areas.

However, the Rural Water Corporation responsible for its administration, and benefiting residents are not providing appropriate maintenance so approximately 20% of the deep wells are continuously out of operation.

Shallow / surface water from the River Nile

Those are considered valuable water resources, however, a major cause of waterborne diseases.

2) Water Supply Needs

The forecasted demand for water was estimated based on population, served population and estimated daily consumption per capita.

	Unit	2006	2011	2015
Population	Person	250,000	394,000	510,000
Served population	Person	134,000	313,000	510,000
Daily consumption per capita	ℓ/day/person	25	46	60
Demand	㎥/day	5,969	21,558	64,499

In order to satisfy the water demand, the following measures should be taken.

Emergency Measures until 2011

Rehabilitation of existing wells, construction of new wells in the surrounding new subdivision areas, support for the Rural Water Corporation, and participation of benefiting residents for maintenance will be carried out.

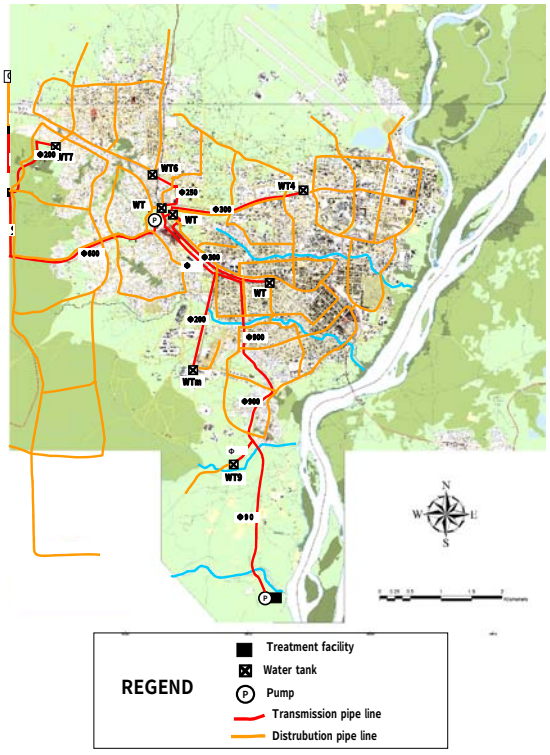
Medium and Long-term Measures until 2015

Implementation of planned water supply system, reinforcement of the water supply authority, and better awareness of water conservation for benefiting residents will be promoted.

3) Water Supply Project

Water Supply Projects

Projects	Scope
Emergency Water Supply Project (Pilot Project under this Study)	Short (2006-2011) ・ Construction of 2 deep wells, elevated water tank and transmission/distribution pipes for 2,300 persons
Water Supply Project under Emergency Rehabilitation Work in Juba (ERWJ)	Short (2006-2011) ・ Rehabilitation of the existing water supply system (7,200cu.m/d treatment capacity and 4km distribution pipe)
Urban Water Supply Project	Short and Middle (2006-2015) ・ Existing 66 deep wells rehabilitation ・ 191 new deep wells construction
Urban Water Supply Project	Short and Middle (2006-2015) ・ Construction of new water supply system including intake/treatment plant and transmission/distribution pipes



Layout Plan of Water Supply

(2) Power Supply

1) Present Power Supply Condition

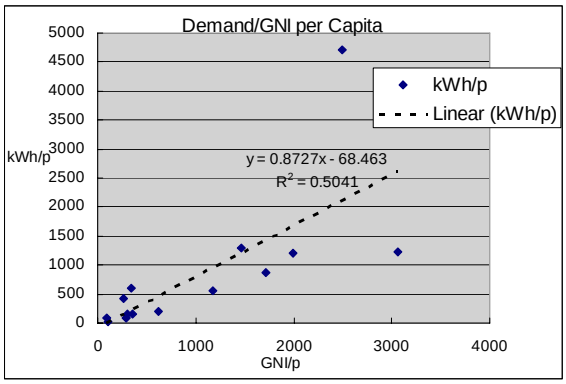
Two of Five power generators of 5MW in total are working. New power generators are now being installed by EWRJ.

New Generators (1MWx5)

New Fuel Tanks

2) Power Supply Needs

Future power demand was estimated based on the assumption that per capita power demand corresponds to per capita income level referring to the examples in other African countries.



DNI and Electricity Demand (Africa)

GNI growth and electricity demand in Juba is estimated below.

Southern Sudan DNI and Electricity Demand

Year	GNI /p	RGNI/p	kWh/p
2005	153	229.5	121
2011	267	400.5	263
2015	425	637.5	459
2025	875	1312.5	1017

Note: RGNI: Regional GNI per capita in Juba

Future electricity power demand by stage was estimated and shown below.

Power Supply Demand in Juba

Term		Short	Medium	Long
		2006-11	2012-15	2016-25
Population	pers.	394,000	510,000	750,000
Unit Demand Per Person	kWh/p	263	459	1017
General Residence	MWh	103,622	234,090	762,731
Others	MWh	51,811	117,045	381,365
Total Needs	MWh	155,433	351,135	1,144,096
Power Demand	MW	17.7	40.0	130.6

3) Power Supply Development Plan/Program

Proposed power supply development projects are shown below.

Power Development Plan

Term	Short	Medium	Long
	2006-11	2012-15	2016-25
Power Demand	17.7	40.0	130.6
Electricity (MWT)	18	40	130

Power Supply Projects

Projects	Scope
Power Supply Project under Emergency Rehabilitation Work in Juba (ERWJ)	Short (2006-2011) ・ Supply and installation of 5x1MW generators for Juba Power St. ・ Rehabilitation of medium and low voltage electricity network
Power Supply Development Project	Short and Medium (2006-2015) ・ Diesel generators with total capacity of 40 MW Short: 13 Middle: 22
Hydroelectric Power Plant Construction Project	Medium and Long (2012-) ・ Construction of new hydroelectric power plant

10. Sanitation Development Plan

(1) Waste Management

1) Present Waste Management Condition

There are mainly three problems to be solved in SWM in Juba.

a) Discharge rules for waste are not yet established. The waste generated in the households is dumped in the field, bush, streams and burned by self-disposal.

b) Capability for waste storage and collection carried out by the districts is lacking. Although each district owns and operates one compactor truck or two lorries daily, one third of the waste generated at the markets cannot be collected and it remains in a heap at the markets.

c) Open dumping of collected waste is taken place. The waste collected by each district is dumped in the field on the south side of Mt. Jebel Kujur without any regulations.

2) Waste Management Development Plan

Technical System

Followings shall be established or provided.

- Proper waste storage system
- Sanitary landfill complying with regulations
- Proper medical waste disposal system
- Separate collection system
- Government related recycling system
- Intermediate treatment system by the construction of compost and sorting plants
- Sufficient waste collection service
- Public education
- Public area cleansing system

Institutional System

Followings shall be improved or established.

- Management/control capability of public organizations concerned with SWM
- Laws and regulations for SWM and medical waste
- Financially sustainable institutional system
- Proper monitoring and information management system
- Proper human resources development programs

The Solid Waste Management Project

Phase / Components	Short term (2006 - 2011)	Medium term (2012 - 2015)
1. MSW Generation (ton/day)		
Generation	426.4	798.7
Discharge	213.2	654.9
Collection	213.2	654.9
2. Refuse Collection & Transportation		
Collection rate	50 %	82 %
Collection system	Communal container collection (point collection)	Communal container collection (point collection)
Major type of vehicles (units)	Compactor trucks ($8\ m^3$): 20	Compactor trucks ($8\ m^3$): 25
Transportation system	Direct haulage	Direct haulage
Executing organization	Each district (payam)	Each district (payam)
3. Public Area Cleansing		
Method of sweeping	Machinery and manual labor	Machinery and manual labor
Operation by	Each district (payam)	Each district (payam)
4. Final Disposal		
Method of operation	Sanitary landfill	Sanitary landfill
Final disposal site	North side of Mt. Jebel Kujur	North side of Mt. Jebel Kujur
Operation by	State Ministry of Physical Infrastructure	State Ministry of Physical Infrastructure
Main equipment	Bulldozer: 1 Excavator: 1 Dump truck: 2 Water tanker: 1	Bulldozer: 2 Excavator: 1 Dump truck: 2 Water tanker: 1
5. Maintenance & Repair		
Preventive Maintenance	District and private workshop	District and private workshop
Major repair	Private workshop	Private workshop
Operation by	District and private	District and private
6. Organizations Responsible for SWM		
Policy or Master plan	GOSS	GOSS
Budgeting	GOSS	GOSS
Detailed plan	State Ministry	State Ministry
Construction	State Ministry	State Ministry
O & M	District (payam)	District (payam)
7. Public Co-operation	Conduct of active public education and co-operation campaigns	Conduct of active public education and co-operation campaigns
8. Medical SWM		
Generation (kg/day)	695.9kg/day	1,233.9kg/day
Treatment at generation	Majority	All institutions
Final disposal	Medical waste disposal site operated by the hospital	Medical waste disposal site operated by the hospital
9. Industrial SWM		
Generation of HW (ton/day)	ND(Construction and demolition waste will increase.)	ND(Construction and demolition waste will increase.)
HW treatment	Treat at generation	Treat at generation
Final disposal	To prohibit and control HW disposal at disposal site	To prohibit and control HW disposal at disposal site

(2) Waste Water Management

1) Present Waste Water Management Condition

There are mainly four problems to be solved in waste water management in Juba.

a) Defecation of residents in open bushes, rather than using latrines is commonly practiced leading to intestinal and gastric disease.

b) Capability for collection of human waste is lacking. The stored human waste in the latrine should be collected periodically, however the number of current vacuum trucks is not enough for the collection of human waste.

c) Collected human waste is not appropriately disposed. The human waste collected is dumped in the field on the south side of Mt. Jebel Kujur without any regulation.

d) Capacity for collection, transportation and treatment of sewage water is lacking. Sewage system composed of a network of piped sewers and stabilization ponds is not established.

2) Waste Water Management Development Plan

<u>Technical System</u>

Followings shall be established or provided.

- Proper human waste storage system
- Sufficient human waste collection service
- Treatment facility for the collected human waste
- Network of piped sewers and stabilization ponds
- Hygienic education

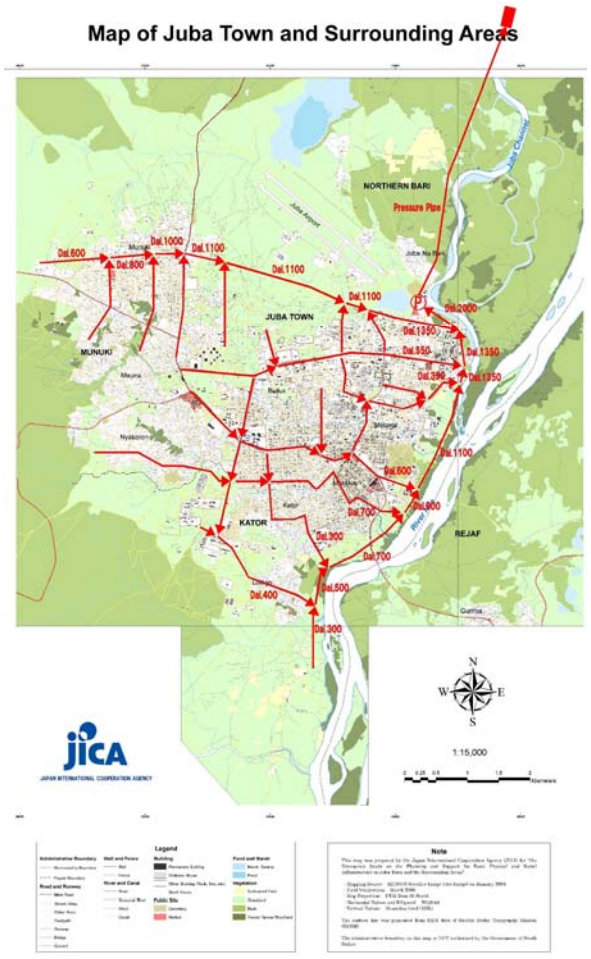
<u>Institutional System</u>

Followings shall be improved or established.

- Management/control capability of public organizations concerned with sanitary management
- Laws and regulations for sanitary management
- Financially sustainable institutional system
- Proper monitoring and information management system with operational database
- Proper human resources development programs

Waste Water Management Projects

Projects	Scope
Sewerage Rehabilitation Project under Emergency Rehabilitation Work in Juba (ERWJ)	Short (2006-2011) ・ Rehabilitation of government office/ministerial houses sewerage and wastewater stabilization pond
Sewerage System Development Project	Short and Middle (2006-2015) ・ Sewer system (total about 350 km of pipe and 2 pump stations) ・ Sewage treatment facility (stabilization pond)
Human Waste Treatment System Development Project	Short and Middle (2006-2015) ・ Construction of 228 public toilets ・ Collection system (vacuum trucks) ・ Human waste treatment facility (stabilization pond)



Plan of Sewer Pipe Network and Treatment Facility

11. Public/Social Facilities Development Plan

(1) Educational Facility Development Plan

1) Present Educational Facility Condition

No. of Schools

36 primary schools in total (17 public and 19 private schools)

13 secondary schools in total (8 public and 5 private schools)

Buildings

The main structure: brick or stone

Roof: corrugated steel plates

Sun-cured bricks, logs or tents are utilized for some buildings.

Problems

a) Many of the existing school buildings have become extremely deteriorated over the time. In addition, the buildings have not been sufficiently maintained due to the long civil wars, resulting in defects in functions.

b) The majority of schools are facing shortage of classrooms. The average number of pupils per classroom at primary schools is 85, which is extremely overcrowded. Secondary school facilities have been well maintained, and the number of students per classroom is appropriate.

c) The teacher training school facilities were destroyed and its functions have been lost, so it has been closed.
The government plans to restart teacher training by utilizing another facility (existing secondary school facility).

2) Needs for School Facilities

Emergency Measures until 2011

- Repair and rebuilding of buildings in order to create a comfortable environment by restoring facility functions and beautiful surroundings
- Enlargement of existing schools to improve an abnormally overcrowded situation

Medium and Long-term Measures until 2015

The estimated number of school-aged pupils and students are shown below.

	Eligible Population 2015	No. of Pupils/ Students 2015	Assumed Enrolment Rate
Primary Sch. (6-14)	121,400	121,400	100%
Secondary Sch. (15-17)	33,150	9,280	28%

In order to meet the increase in demand for teachers necessary for new schools to be constructed by 2015, 2 buildings should be repaired and 1 new teacher training school should be constructed.

3) Educational Facility Development Plan

The plan is applied to public school facilities.

Educational Facility Projects

Projects	Scope
Primary School Rehabilitation and Expansion Project	Short (2006-2011) ・ Rehabilitation of 92 classrooms ・ Construction of additional 111 classrooms
Primary/Secondary Schools Construction Project	Short and Middle (2006-2015) ・ Construction of primary schools with total 1,992 classrooms ・ Construction of secondary schools with total 58 classrooms
Teacher Training School Improvement Project	Short and Middle (2006-2015) ・ Repair of 2 existing buildings and construction of 2 additional buildings

Classroom of Primary School

(2) Health and Medical Facility Development Plan

1) Present Health/Medical Facility Condition

Medical Health Service System in Southern Sudan

Service system is composed of 3 stages of District Hospital (DH) ― Primary Health Care Center (PHCC) ― Primary Health Care Unit (PHCU) except for hospitals in large cities which are controlled by the central government.

Juba Teaching Hospital (JTH) under direct control of the central government, and which has received assistance of ICRC/USAID, is positioned at the center for the development of a health and medical services system.

No. of Facilities

2 rural hospitals, 7 health centers and 36 health units (estimated)

Service Level

The number of hospital facilities is relatively large (one facility/125,000 persons) compared with the average number of hospitals in rural areas (one facility/400,000 persons). The number of health centers or health units appears to be relatively large.

The GOSS has implemented Umbrella Program for Health System Development (UPHSD) to develop a health and medial services system financed by MDTF of the World Bank by setting a goal of increasing accessibility to basic primary medical treatment from 25% to 50% (2011) in accordance with the JAM framework.

UN organizations and NGOs also have implemented urgent projects for improving the accessibility to primary medical treatment, the major supporting activities of NGOs in health and medical facility development in Juba are the repair of pharmaceutical warehouses.

Problems

a) Services are at extremely low level in both quality and quantity of facilities and personnel due to the existing disparity between the south and north and the impact of civil war.
b) Some hospital acceptance is restricted for the general public. Therefore, facilities are not available in Kator and Munuki districts where a rapid increase in population is anticipated.

2) Health and Medical Services Needs

The accessibility rate of 100% by 2015 indicates the population ratio per each facility as follows.

DH: one facility (100 beds)/100,000 persons
PHCC: one facility/17,500persons
PHCU: one facility/3,500 persons

GOSS has an intention to double the accessibility rate of health and medical services (from 25% to at least 50% by 2011).

3) Health and Medical Facility Development Project.

Health and Medical Facility Development Plan (New Construction)

Facility	- 2008	- 2011	- 2015
D. Hospital	1	1	2
PHC Centre	1	7	15
PHC Unit	3	31	76

Health/Medical Facility Projects

Projects	Scope
Health Center and Hospital Rehabilitation Project	Short (2006-2011) ・ Rehabilitation of Health and Medical Facilities ・ Human Resource Development and Capacity Building
District Hospital Development Project	Short and Middle (2006-2015) ・ Construction of 4 district hospitals
PHC Center and PHC Unit Development Project	Short (2006-2011) ・ Construction of 30 PHC (primary health care) centers and 146 PHC units

12. Implementation Program of Physical and Social Infrastructure Development Plan

Project	Major Scope of the Project	Cost (Million USD)			
		2006-2011	2012-2015	2016-2025	Total
Road Transport					
TR-1: Road Rehabilitation Project under Emergency Rehabilitation Work in Juba	Rehabilitation of roads (30km in LOT1 and 30km in LOT2)	24.00	-	-	24.00
TR-2: Road Network Development Project, Phase-1	Class A roads (85km), Class B roads (69km), Class C roads (581km), Non-motorized transport route (60km)	72.68	188.84	-	261.52
TR-3: Road Network Development Project, Phase-2	Urban highway (76km), Interchanges/intersections (25)	9.72	42.52	38.61	90.85
TR-4: Nile River Bridge Construction Project	Phase-1 (1 bridge), Phase-2 (5 bridges)	10.85	53.49	22.16	86.50
TR-5: Transport Terminal Construction Project	Phase-1 (5 bus terminals), Phase-2 (3 truck terminals)	0.24	1.00	-	1.24
	Sub-total Cost	**117.49**	**285.85**	**60.77**	**464.11**
River Transport					
TP-1: Juba Port Improvement Project (Pilot Project under this Study)	Construction of 35 m pier	1.70	-	-	1.70
TP-2: Juba Port Expansion Project	Expansion of pier to 70 m	1.85	-	-	1.85
TP-3: New Port Construction Project	Construction of new port	-	0.60	12.32	12.92
	Sub-total Cost	**3.55**	**0.60**	**12.32**	**16.47**
Air Transport					
TA-1: Juba International Airport Rehabilitation Project	Rehabilitation of runway/terminal, Construction of protective fence, Upgrading of air navigation aid system, Procurement of other facilities	1.50	-	-	1.50
TA-2: Juba International Airport Development Project	Expansion of runway to 3,000 m, Improvement of terminal building and control tower	10.30	-	-	10.30
TA-3: New Juba International Airport Construction Project	Construction of new international airport	-	1.26	41.80	43.06
	Sub-total Cost	**11.80**	**1.26**	**41.80**	**54.86**
Water Supply					
WS-1: Emergency Water Supply Project (Pilot Project under this Study)	2 deep wells with submersible pumps, elevated water tank & transmission/distribution pipes	0.96	-	-	0.96
WS-2: Water Supply Project under Emergency Rehabilitation Work in Juba	Rehabilitation/improvement of existing water supply system getting water from Nile River	10.54	-	-	10.54
WS-3: Urgent Water Supply Project	Rehabilitation of 66 existing wells, Construction of 191 new wells	22.40	4.30	-	26.70
WS-4: Urban Water Supply Project	Construction of new water supply system including intake/treatment plant & transmission/distribution pipes	12.63	40.48	-	53.11
	Sub-total Cost	**46.53**	**44.78**	**-**	**91.31**
Power Supply					
PS-1: Power Supply Project under Emergency Rehabilitation Work in Juba	Installation of 5 1-MW generators in Juba Power Station	5.30	-	-	5.30
PS-2: Power Supply Development Project	Diesel generators with total capacity of 40 MW	15.43	14.56	-	29.99
PS-3: Hydroelectric Power Plant Const. Proj.	Construction of new hydroelectric power plant	*	*	*	*
	Sub-total Cost	**20.73**	**14.56**	**-**	**35.29**
Solid Waste Management					
SS-1: Solid Waste Management Development Project	Improvement of waste collection system, Sanitary landfill site development, Establishment of medical waste disposal system	3.52	1.36	-	4.88
	Sub-total Cost	**3.52**	**1.36**	**-**	**4.88**
Waste Water Management					
SW-1: Sewerage Rehabilitation Project under Emergency Rehabilitation Work in Juba	Rehabilitation of sewerage system (pipe and stabilization pond) for government offices and ministerial houses	4.78	-	-	4.78
SW-2: Sewerage System Development Project	Sewer system (350 km pipe & 2 pump stations), Sewage treatment facility (stabilization pond)	66.33	85.32	-	151.65
SW-3: Human Waste Treatment System Development Project	Construction of 228 public toilets, Collection system (vacuum trucks), Human waste treatment facility	2.25	0.09	-	2.34
	Sub-total Cost	**73.36**	**85.41**	**-**	**158.77**
Educational Facilities					
FE-1: Primary School Rehabilitation and Expansion Project	Rehabilitation of 92 classrooms, Construction of additional 111 classrooms	8.46	-	-	8.46
FE-2: Primary/Secondary Schools Construction Project	Construction of primary schools (1,992 classrooms), Construction of secondary schools (58 classrooms)	21.58	89.18	-	110.76
FE-3: Teacher Training School Improvement Project	Repair of 2 existing buildings, Construction of 2 additional buildings	1.19	-	-	1.19
	Sub-total Cost	**31.23**	**89.18**	**-**	**120.41**
Health and Medical Services					
FM-1: Health Center and Hospital Rehabilitation Project	Rehabilitation of health centers and hospitals	4.90	-	-	4.90
FM-2: District Hospital Development Project	Construction of 4 district hospitals	12.19	4.85	-	17.04
FM-3: PHC Center/Unit Development Project	Construction of 30 PHC centers & 146 PHC units	35.93	35.93	-	71.86
	Sub-total Cost	**53.02**	**40.78**	**-**	**93.80**
	Total Cost	**361.23**	**563.78**	**114.89**	**1,039.90**

* Since this project covers the whole Southern Sudan, it is considered to be beyond the scope of the Juba Town Development Plan.

Major Component Projects of Basic Physical and Social Infrastructure Development Plan

Code		Project Name	2006-2011						2012-2015				2016-2025				
			1	2	3	4	5	6	1	2	3	4	1	2	3	4	5
Transport Infrastructure																	
Road Transport	TR-1	Road Rehabilitation Project under Emergency Rehabilitation Work in Juba (ERWJ)															
	TR-2	Road Network Development Project, Phase-1															
		Class A															
		Class B															
		Class C															
		NMT															
	TR-3	Road Network Development Project, Phase-2															
		Urban Highway															
		Interchange/Intersection															
	TR-4	Nile River Bridge Construction															
		Nile River Bridge (B1)															
		Nile River Bridges (B2-B6)															
	TR-5	Terminal Construction Project															
		Truck Terminal															
		Bus Terminal															
River Port	TP-1	Juba Port Improvement Project (Pilot Project under this Study)															
	TP-2	Juba Port Expansion Project															
	TP-3	New Port Construction Project															
Airport	TA-1	Juba International Airport Rehabilitation Project															
	TA-2	Juba International Airport Development Project															
	TA-3	New Juba International Airport Consruction Project															
Utilities																	
Water Supply	WS-1	Emergency Water Supply Project (Pilot Project under this Study)															
	WS-2	Water Supply Project under Emergency Rehabilitation Work in Juba (ERWJ)															
	WS-3	Urgent Water Supply Project															
		Urgent Water Development															
		Capacity Building															
	WS-4	Urban Water Supply Project															
Power Supply	PS-1	Power Supply Project under Emergency Rehabilitation Work in Juba (ERWJ)															
	PS-2	Power Supply Development Project															
	PS-3	Hydroelectric Power Plant Construction Project															
Sanitation																	
Solid Waste Management	SS-1	Solid Waste Management Development Project															
		Public Education															
		Collection System Improvement															
		Construction of Landfil															
Waste Water Management	SW-1	Sewerage Rehabilitation Project under Emergency Rehabilitation Work in Juba (ERWJ)															
	SW-2	Sewerage System Development															
		Sewerage Pipe Installation															
		Treatmet Facility Construction															
	SW-3	Human Waste Treatment System															
		Hygiene Education															
		Public Toilets Construction															
Public/Social Facilities																	
Educational Facilities	FE-1	Primary School Rehabilitation and Expansion Project															
		Primary School Rehabilitation															
		Primary School Expansion															
	FE-2	Primary/Secondary Schools Construction Project															
		Primary Scool Construction															
		Secondary School Construction															
	FE-3	Teacher Training School Improvement Project															
		Teachers Training School Rehabilitation															
		Teachers Training School Construction															
Health and Medical Services	FM-1	Health Center and Hospital Rehabilitation Project															
		Human Resource Development for															
		Capacity Building for Policy, Operation, Budgets, and Coordination															
		Health Center and Hospital Rehabilitation															
	FM-2	District Hospital Development															
		District Hospital Improvement															
		District Hospital Construction															
	FM-3	PHC Center and PHC Unit DevelopmentProject															
		PHC Center Construction															
		PHC Unit Construction															

Lead time (financial arrangement, feasibility study, basic design, detailed design, tendering, contracting, etc.)

Construction/implementation

Implementation Schedule of Projects

13. Community-Based Development Plan

(1) Characteristics of Communities

1) Community Structure

Juba Town Area consists of three town Payams named Juba Payam, Kator Payam, and Munuki Payam. These three Payams and a part of Nothern Bari Payam bounded on the north by Juba Payam form an unified metropolitan area. Each Payam is divided into residential quarters having their chiefs who are selected by the residents themselves and play an arbitrational role or judicial function.

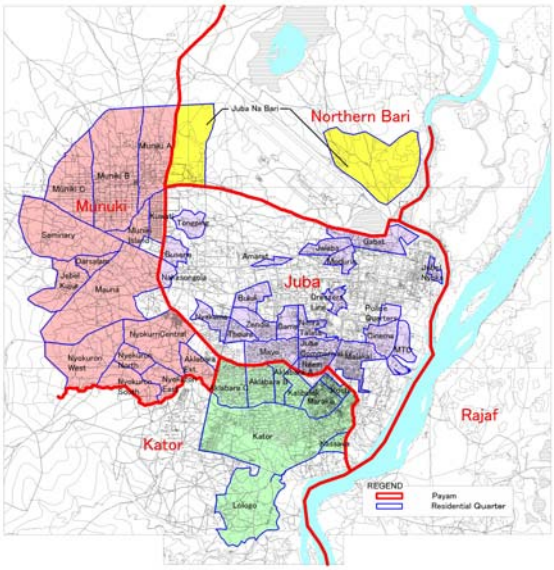


Figure 6.1.1-1 Location of Residential Area

Location of Residential Quarters

2) Profile of Community

The information on community was obtained through the interview with 4 Payam Offices and 12 selected residential quarters. Based thereon, the communities are characterized as follows:

- Average population density is 101 persons / ha.
- There are a wide variety of tribes living in mixture, 14 tribes in the 12 sample quarters.
- Christians account for 87 %.
- There are five residential quarters where many IDPs/refugees reside. Many of them want to return to the places of origin.
- 55% of people get water from common wells.
- No people is supplied with electric power.
- As urgent measures to improve the living condition, the communities desire the basic infrastructures to be constructed/improved, including road, electricity supply, public toilet, water supply, waste management and school.

(2) Community Development Needs

There are a large variety of needs for community development. The followings are the typical ones:

- Water supply and sanitation
- Power supply including electricity and gas
- Living physical environmental improvement in housing, feeder road, drainage, waste management, etc.
- Health service and education
- Formal and informal education
- Community organizing to promote community-based activities
- Income generation measures

(3) Activities of Foreign Assistance for Community-Based Development

Many international NGOs and organizations such as ACF-USA, ADRA, CRS, SFM, ACORD and Skills for Southern Sudan conduct the community development activities as listed below with available funds from donor countries and international organizations :

- Water supply by wells with hand pumps
- Installation of latrines and sanitary education
- Health center/dispensary establishment and operational support
- Construction of abattoir
- Education of school teachers and support for school operation
- Income generation activities with skill training and basic education

(4) Projects/Programs for Community Development

1) Role and Function of Community

- The role and function of the community should be clarified distinguishing them from those of governments. The governments should play the principal roles in development of basic physical and social infrastructures along the urban development plan to be formulated by the governments.
- However, communities are expected to play important role in accommodating IDP returnees as the governments system is not adequately developed yet.
- There is room for community to participate in the development of basic infrastructures to be basically implemented by the governments.

2) Major Projects/Programs

The following projects/programs are in general considered as major projects to be implemented by community itself or with the lead of community :

- Institutional/managerial development to enhance the community's capability such as
  - Enhancement of local authorities' capacity
  - Establishment/reinforcement of community organizations
  - Establishment of organizations for operation/ maintenance of infrastructures if conducted by community
  - Development of micro-financing system
- Livelihood improvement measures
- Construction and management of facilities for community (community centers, parks, public lavatories, markets, etc.)
- Participation in infrastructure projects to be implemented mainly by governments and their operation/maintenance

Among the above projects/programs, two typical community development projects, i.e. a) local authority capacity building and community formulation/enhancement, and b) urban livelihood improvement are discussed below.

The project for local authority capacity building and community formulation/enhancement aims at provision of adequate administrative services and public service to the residents with consequent orderly community formulation for the incoming residents and promotion of community supportive activities of overall residents in infrastructure and public service provision. The main components of the project are a) institutional development and clerical capacity building, b) public administration capacity building and community formulation, and c) public service provision capacity building and community activity enhancement.

The project for urban livelihood improvement aims to provide the residents and IDP returnees without means for livelihood due to wars with income generation means. The project have various components including a) urban type earning skills training, and b) small scale business venturing promotion.

(5) Recommendations in Implementation of Community Development Projects

1) Role of Governments

Governments should establish definitely the policy and strategy for community development, demarcating the roles of the governments and community, and take necessary measures for enhancement of the implementing capacity of the community.

2) Formulation of Own Community Development Plan

It is desirable for each residential quarter to prepare its own community development plan along the government's basic policy for community development through the following procedures : a) identification of problems/ challenges, b) formulation of projects to solve the problems, c) planning of implementation schemes, d) consideration on urgencies/ priorities of the projects, and e) preparation of an implementation program.

3) Coordination with Governments

The component projects in the community development plan will be divided into a) those to be done by governments, b) those to be done by community itself, and c) those to be done jointly by both. The community should actively request the governments to forward a), request to the governments the possible supports for b), and closely negotiate with the governments on c).

4) Consideration to Gender

The community development projects should be planned and implemented, respecting and reflecting the women's opinions since women tend to be placed at vulnerable positions in the society. Organizations for women such as women's union are desired to be established.

5) Community's Participation in Government Projects

In case of infrastructure development project which is a typical government project, the community can participate in the following forms :

- Planning Stage:
  Actively indicate the opinions.
- Construction Stage:
  Provide the manpower, and organize a construction unit in the community and make a construction contract with government.
- Operation/Maintenance Stage:
  For water/power supply projects, directly manage the operation by creating proper organizations like water management union in the community. For maintenance work, provide the manpower, and organize a maintenance unit in the community and be entrusted for maintenance work.

PART III PILOT PROJECTS

14. Pilot Project in Transport Sector

(1) Outline of the Project

1) Selection of Project

Juba Port Improvement Project is selected as the pilot project in the transport sector, as per the Minutes of Meeting on Scope of Work for the Study agreed upon between GOSS and JICA.

This project is considered to be a short-term-project in the infrastructure development plan in the river transport sector.

2) Location and Facility Specifications

Location

The present port area is selected as the location of the project, out of the following candidates:

- Old port: Physical condition of the river is not suitable for navigation at present: The rehabilitation of the old port needs extensive river works.
- Present port: No problem in physical condition of the river and accessibility to the town road network, making it possible to complete the works in a short time.
- New locations such as the point about 20km south of the town and eastside riverbank: No access road to the town at present.

Facility Specifications

A 35-meter berth with a gantry crane for loading/unloading operation is selected, based on:

- Major vessels: barges with a length of 35 m
- Transport demand: 7,400 to 9,000 tons/ month in year 2015
- Cargo handling capacity: 7,500 tons/month in case of 35 m berth with a crane and 9,000 tons/ month in case of 70 m berth with cranes

It is expected that the berth will be extended to 70 m in near future

3) Scope of the Project

Construction of Berthing Facility (Jetty)

Type: Piled pier having a floor system on piles, having the advantages of easiness of construction, short construction period and less influence of waves on vessels when berthed.

Length: 35 m, based on the length of barge

Width: 16 m, to secure the required water depth of 2.2 m in dry season

Provision of Cargo Handling Yard

A flat area of 35m in length and 30m in width to accommodate a gantry crane and allow trucks to turn

The yard includes the 16m wide pier and the remaining width of 14m is constructed by excavating the shore behind the pier and paved with cement-treated base (CTB) and double bituminous surface treatment (DBST).

Installation of Pier Facility

A gantry crane equipped with generator for loading/unloading operation

Specifications are as follows:

- Rated load: 1.5ton
- Span: 15.4m
- Lift: 4.0m
- Cantilever length: 6.5m with an effective length of 6.0m to reach the center of barges

a) Installation of mooring facility

Four bollards.

b) Construction of storage facility

A 4 m x 4 m wide fuel storehouse, and a 4 m x 4 m wide tool storehouse, built of bricks

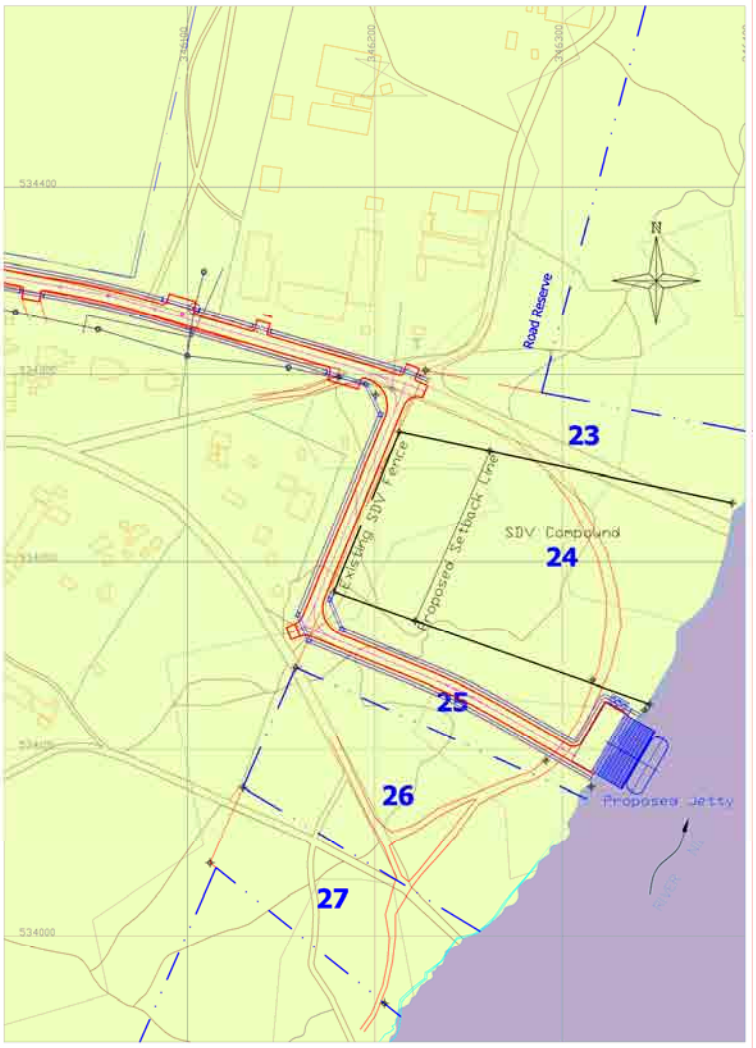
c) Improvement of access road

The access road from the cargo handling yard to the arterial road network of the town

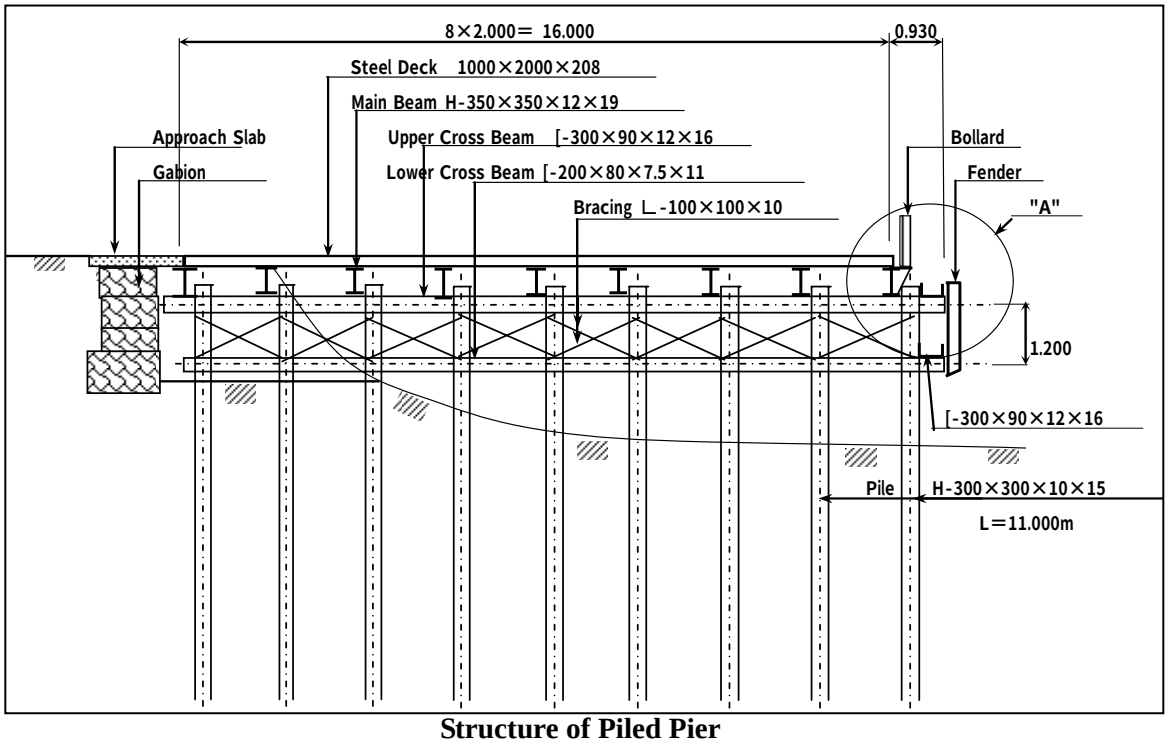
- Length: about 600m
- Cross sectional element:
  Carriageway: 3.5m/lane x 2 lanes
  Shoulder: 1.5m x 2
  Side ditch: earth ditch with upside width of 1.5m, bottom width of 0.8m and 0.7m height.

(2) Design

Shown in the following Figures.



Layout of Port Facilities

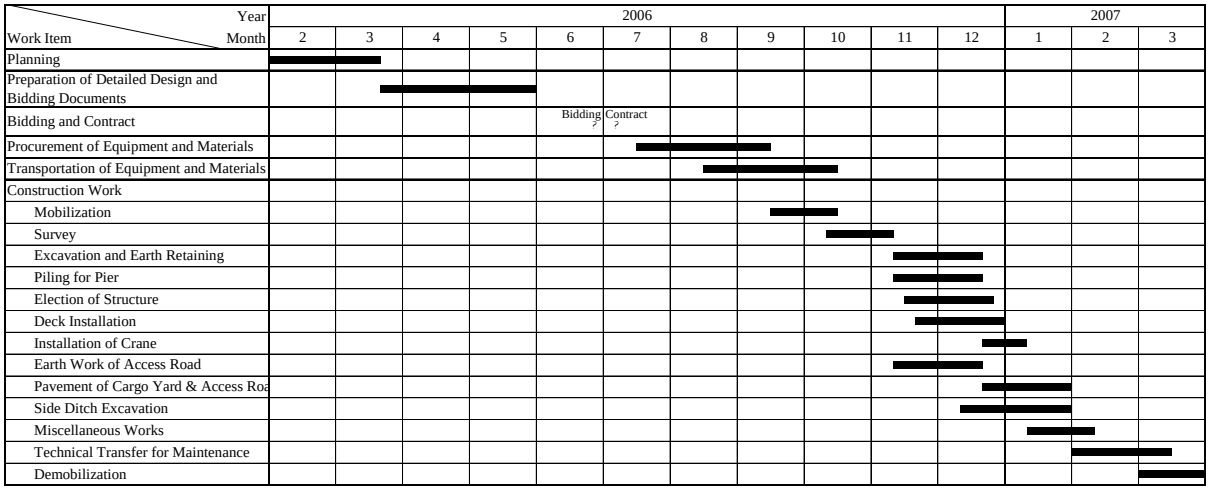


Structure of Piled Pier

(3) Construction Pan

1) Implementation Schedule

Implementation Schedule



2) Progress

As a whole, actual cumulative progress has reached 68.0% against the revised planed progress of 77.0% at the end of February 2007.

(4) Operation, Maintenance and Management Plan

Following maintenance and operation plan is proposed.

1) Inspection Plan

Inspection Contents of the Pier Type Mooring Facility

Target Deformations	Location	Contents
Corrosion	Pile	Condition of Corrosion Thickness of Material
Cracking	Apron	Condition of Cracking (Exfoliation / Damage)
Damage / Subsidence	Approach Slab	Condition of Subsidence, Shift, Damage

Contents and Frequencies of Regular Inspection of the Pier Type Mooring Facility

Location	Contents	Frequency
Pile	Condition of Corrosion Thickness of Material	Every 2 Years Every 5 Years
Apron	Condition of Cracking	Every 2 Years

Inspection of Crane Equipment with Hoist

Since the crane equipment containing the hoist is main equipment used for the cargo handling works, it becomes fatal for cargo handling works if failure of equipment occurred.

Therefore, periodical maintenance and management is required for so that these equipment work safely without break down.

Although contents of inspections, frequency of renewal, etc. required for this cargo handling equipment should be defined in consideration of the regulation, the situation of supply of the equipment and parts, maintenance of the apparatus, etc. in the Southern Sudan should also be considered.

Required Draft for the Mooring Vessels

Even if the facility of the piled pier (including apron) is maintained well, enough draft for the typical barges with displacement tonnage of 500 shall be secured. Therefore, measures, such as periodical inspection of water depth and maintenance dredging at the time of sedimentation, are also required.

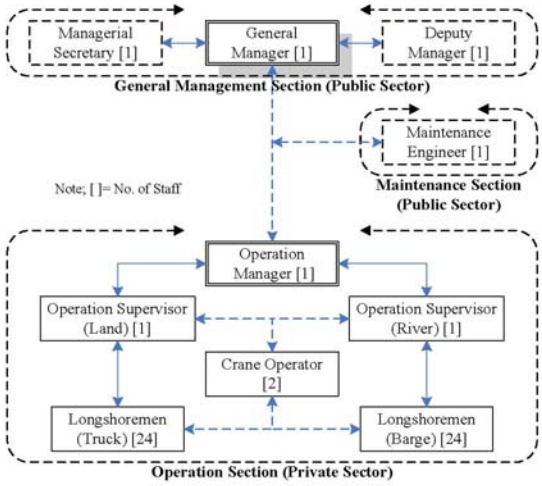
2) Operation, Maintenance and Management Plan

Followings are proposed for reference purpose based on the study result. Actual implementation

plan shall be determined by the Government of Southern Sudan

Operation, Maintenance and Management Organization

It is assumed that the facilities provided under the project will be managed by River Transport Corporation (RTC). Among the general management, maintenance, and operation, operation might be handled by public or private sector. Following proposed structure is on condition of later case.



Proposed Operation & Maintenance Structure

Operation Cost and Revenue

Cost & Revenue for Operation & Maintenance

Contents		USD/Ton	USD/Year
Management	Personnel (General Management)	0.57	50,625
	Personnel (Operation)	4.32	388,125
	Office	0.31	27,450
	Fuel (Crane)	0.15	13,500
	Sub Total	5.35	479,700
Maintenance	Personnel (Inspection)	0.23	20,250
	Mooring Facilities*	0.08	6,777
	Crane Facilities*	0.25	23,138
	Water Surface*	0.15	1,350
	Sub Total	0.71	63,665
Revenue (Estimate)		415	37,350,000

* include parts and works

Sum of operation and maintenance cost calculated from estimated annual handling cargo volume is estimated as around USD 6 per ton. On the other hand, revenue under current tariff is estimated at USD 415 per ton. Therefore, future operation and maintenance cost will be sufficiently covered enough by the revenue from current tariff system.

Contents of Inspections

Followings are contents and frequency of the inspections and repair works required in case of something unusual observed;

Facilities / Equipment		Components	Contents of Inspections	Frequency of Inspections			Repair Works
				Regular	Detail	Irregurar	
Mooring Facility	Pier	Quay Wall Alignment	Irregular Alignment of Quay Wall	Weekly	Biannual	Abnormal Incidents, such as Corrision	-
		Main Girders	Deformation, Damage, Corrosion, and Cracking at Welding P	Weekly	Biannual		Partial Reinforcement, Reconstruction, or Repair
		Laterals / Bracings	Deformation, Damage, Corrosion, and Cracking at Welding P	Weekly	Biannual		
		Other Major Members	Deformation, Damage, Corrosion, and Cracking at Welding P	Monthly	Biannual	-	
		Bolts & Nuts	Ommision, Damage and Corrosion	Weekly	Biannual	- ditto -	Repair, or Replacement
		Deck Plates	Deformation, Damage, Corrosion, Loose, and Gap	Weekly	Biannual	-	
		Fender	Deformation, and Damage	Weekly	Biannual	- ditto -	Replacement
		Mooring Posts	Deformation, and Damage	Weekly	Biannual		Repair, or Replacement
		Approach Slab	Damage, Loose, and Gap	Weekly	Biannual		
	Apron	Pavement	Subsidence, Cracking, and Gap	Weekly	Biannual	- ditto -	Repair
Cargo Handling Facility	General Facilities		Maneuvering by Std Loading and Speed	Monthly	Annual	-	Repair
	Gantry Crane Structures	Wheels & Rails	Deformation, Damage, Corrosion, and Crunching Foreign Su	Weekly	Annual	Abnormal Incidents, such as Corrision	Repair, or Replacement
		Posts & Beams	Deformation, Damage, Corrosion, and Cracking at Welding P	Weekly	Annual		Reinforcement, or Replacement
		Bolts	Loose, Omiision, Damage, and Corrosion	Weekly	Annual		Replacement
	Crane Equipment	Hoist	Irregular Vibration, Noise, and Temparature Increases	Weekly	Annual	- ditto -	Parts Replacement
		Anti Over Rolling Devise	Mulfauncitons	Weekly	Annual		Replacement
		Over Loading & Other Warning Dev	Mulfauncitons	Weekly	Annual		
		Wire Rope & Sling Chain	Damage	Weekly	Annual		
		Hook, Grab Bucket, etc.	Damage	Weekly	Annual		
		Power Cable, Control Panel, and Cor	Mulfauncitons	Weekly	Annual		
Water Surface		River Bed in front of Pier	Sedimentations (Design Draft)	Monthly	Biannual	- ditto -	Maintenance Dredging

15. Pilot Project in Water Supply Sector

(1) Outline of Project

1) Selection of the Project

Considering the nature of the pilot project and the policy of Sudanese Government on water supply development as shown below, a piped water supply system in which water is drawn from deep wells is selected as a pilot project in the water supply sector.

Nature of the Pilot Project

The pilot project is the urgent rehabilitation of basic infrastructure to be implemented in a short time in order to meet the urgent needs. A water supply system taking water from the River Nile is not suitable as the pilot project since it is too large in scale to be implemented in a short time.

Policy of Sudanese Government on Water Supply Development

The basic policy of GOSS on water supply development is that the piped water supply system is applied in the urban areas while direct supply of water from wells operated by hand pumps is acceptable in the rural areas.

2) Location and Population Served

Proposed location of wells is the northern part of Munuki, where houses are infrequent. The reason of selecting the location is as follows:

In the populated area, there exist many wells at short distances of 100 to 300 meters from each other and the ground water level tends to drawdown due to interference between wells. Intake of water from new deep wells with submersible motor pumps in such an area threatens to further lower the ground water level and makes the existing wells un-operational. Therefore, new wells are planned to be located in the area with less houses.

Target area is the northern part of Munuki, which is populated but not supplied with sufficient water. The project is planned to serve about 2,300 people and supply 13 to 20 litters of water per person per day, depending on the possible amount of water to draw.

3) Scope of the Project

The project includes the following items:

- Construction of 2 deep wells with submersible motor pumps and generators
- Construction of an elevated water tank
- Laying of water transmission pipe from the wells to the elevated water tank
- Laying of water distribution pipe from the elevated water tank to 8 public hydrants
- Construction of 8 public hydrant and installation of 3 taps each at the hydrant

(2) Design

The water supply facilities to be designed are illustrated in the figures in the next page.

(3) Construction Plan

1) Implementation Schedule

The implementation plan is divided into eight items as follows;

a) Borehole drilling work
b) Pumping test
c) Installation of submersible pump
d) Building work
e) Transmission pipe laying work
f) Distribution pipe laying work
g) Elevated tank installation work
h) Hydrant installation work

The implementation schedule is shown in the table in the next page.

2) Progress

Progress of Procurement and Transportation

It comes into service in July, and the progress rate as of the beginning of December is 100%.

Progress of Construction

The progress as of the end of February 2007 are followings.

a) Distribution pipe	Completed: 1,950m (Backfill is completed)
b) Transmission pipe	Planned:1,335m Actual: 180m
c) Elevated tank	Foundation work is completed.
d) Public hydrant	Completed: 8 nos.

Remaining Works

- Drilling of well and pump installation: 2 nos.
- Construction of control house: 2 ridges
- Laying transmission pipe: 1,205m
- Installation of elevated water tank: Construction of structures and FRP tank installation

Future Schedule

For 2 successful wells, 5 wells were drilled by February 28th and at present 6th well is being drilled. After selection of 2 successful wells, the remaining works for transmission pipe, installation of submersible motor pump and generator, and elevated water tank are expected to be completed by 30th of April.

3) Quality Control

Followings are main quality control items.

Materials

Concrete: Trial mix report and site test results

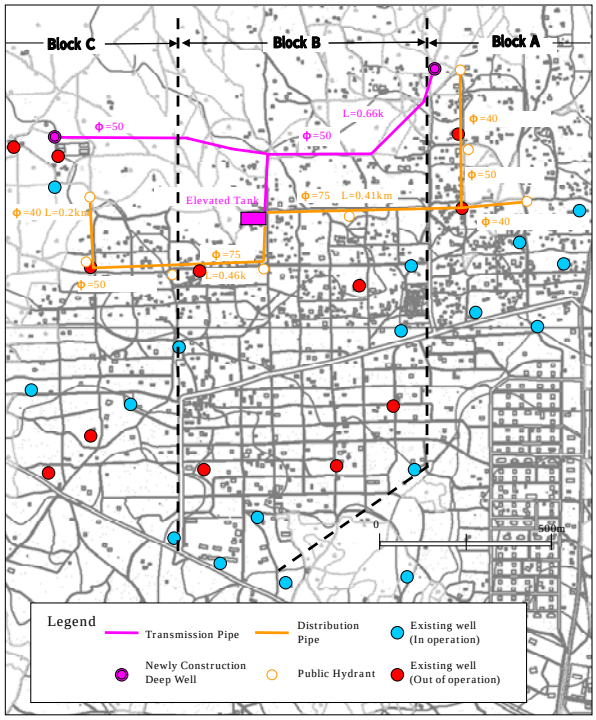
Reinforced bar: Mill sheet

Inspection

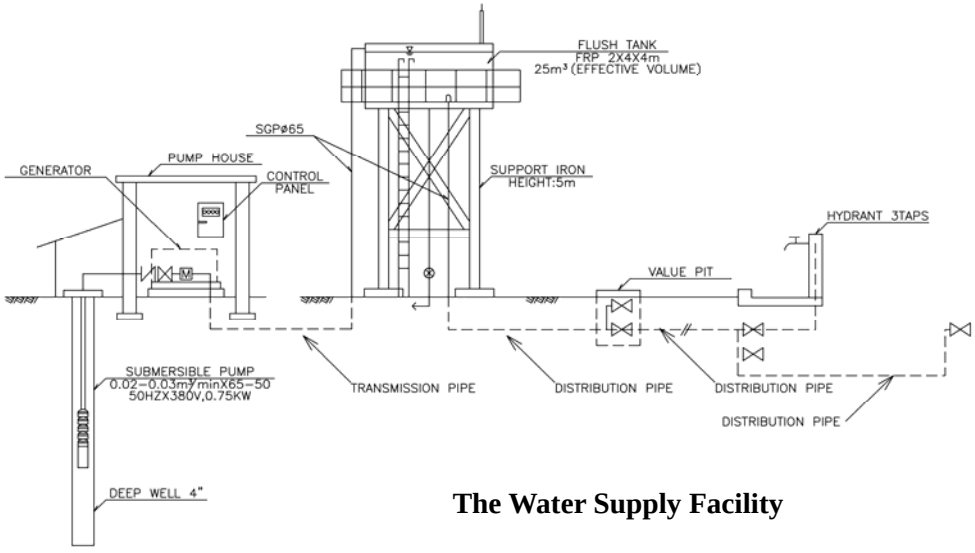
Pumping test: Be scheduled

Water quality test: Be scheduled

Water leak test: As described in the report of water leak test



Layout Plan of Water Supply Facility



The Water Supply Facility

Water Supply Work Implementation Schedule

Work Item	Month	2006 7	8	9	10	11	12	2007 1	2	3	4
Borehole Drilling	3nosx2places										
Pumping Test	3nosx2places										
Submersible Pump Installation	2 places										
Building Work BUILDING WORK											
Transmission Pipe Laying											
Distribution Ppe Laying											
Elevated Tak Installation											
Hydrant Installation											

Procurement Construction Work

4) Operation, Maintenance and Management Plan

Although the detailed Maintenance and Management Plan are the items to be decided by GOSS, as a reference, the result considered in the Study is mentioned below.

Organization

The organization responsible for maintenance and management of water supply system in the Pilot Project shall be Urban Water Corporation. However, because of limited budget and lack of skilled staff, the organization is in a difficult situation to arrange full-time staff except two operators for submergible pumps and generators for maintenance and management.

Therefore, the beneficiaries shall be requested to participate in the maintenance and management of the new system. They shall organize the Water User's Association and play a role mainly of collection of water charges and fair water distribution at standpipe.

The organization chart of maintenance and management for the new system is shown in the figure.

Maintenance and Management Items

Maintenance and Management shall be carried out at following allotment.

a) Urban Water Corporation
- Preparation of water supply plan
- Procurement of materials and machine for maintenance
- Inspection of submergible pump and rising
- Provision of technology transferring and training for maintenance and management and hygiene education to committee of Water User's Association.

b) Operator of Pump
- Daily check of pumps and generators according to operation and maintenance manual
- Operation of pumps and generators
- Cleaning of control houses

c) Water User's Association
- Collection of water charges
- Water supply control at public standpipe
- Daily inspection and reporting to UWA

Operation and Maintenance Cost

Operation and Maintenance cost is estimated as shown below.

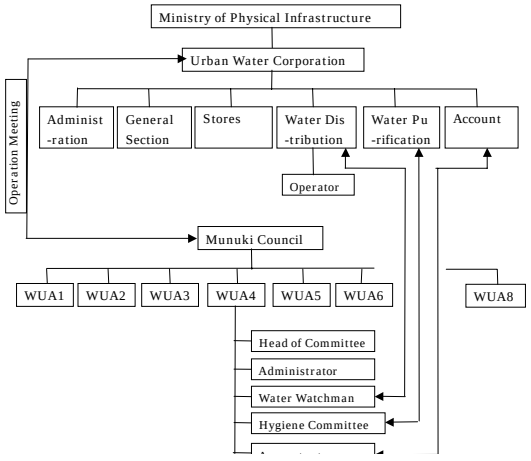
Items		USD/year
Operation Cost	Expenses for UWC staffs	600
	Salary of operator	14,400
	Reward to water user's association	1,646
	Fuel cost	15,610
	Total	32,256
Maintenance Cost	Expenses for UWC staffs	300
	Maintenance cost	5,354
	Total	5,654
Grand Total		37,904

Operation Plan

Cost is covered at the following allotment.

Maintenance & Management Cost	USD/Year
Urban Water Corporation	
Expenses for UWC staffs	900
Salary of operator	14,400
Total	15,300
Water User's Association	
Reward for committee of WUA	1,646
Fuel cost	15,610
Maintenance cost	5,354
Total	22,610
Tarrif	USD/H.H/month
22,610USD/460H.H	4.1

Water tariff of 4.1USD/month per household almost equivalent to those charged to second class family in the present urban water supply work in Juba is levied from members of WUA.



Organization Chart for Operation and Maintenance

16. Pilot Project for Supporting Community

(1) Outline of the Project

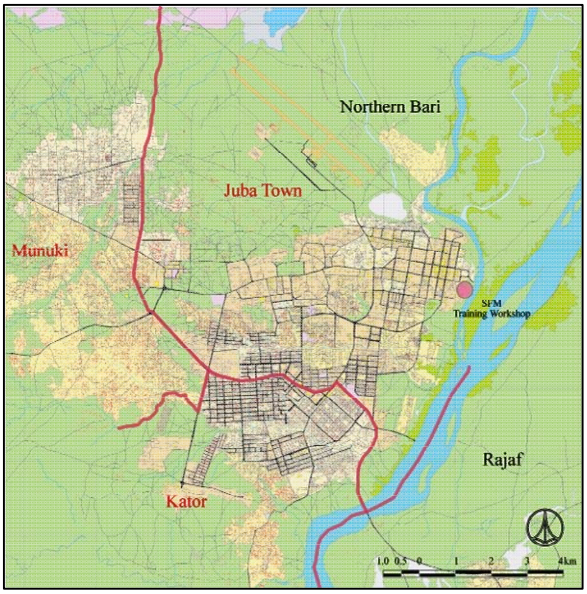
1) Project Purpose and Effects

Project Purpose

To establish training programs to provide basic job oriented skills, which can be utilized for envisaged reconstruction works of Juba Town as the Capital of the South Sudan, to community people in Juba Town and surrounding areas for their livelihood improvement.

Effects of the Project

Aims of the Project include 1) Preventing alienation of local people from expecting development of Juba Town, 2) Contribution of domestic human resources for construction and other economic activities, 3) Promotion of small scale business venturing utilizing attained skills, and 4) Improvement of investment efficiency by reducing economic leakage.



Project Site

2) Output

- To establish two executive bodies of the skill training programs
- To establish two training centers with adequate facilities, machinery, equipment, tools, and material for the skill trainings to community people of Juba Town for its reconstruction. These skills include carpentry, masonry, plumbing, electricity wiring, vehicle maintenance and repair, mechanical, electric appliance repair, woodworks, welding and so on.
- To establish training programs regarding the said skills and associating basic education for skill acquisition and entrepreneurship with built-in sustainable mechanism.
- To complete the initial training courses with common participants.

3) Implementing Body and Contract Features

Based on the above mentioned intention of the project the Team searched for prospective NGOs for the project implementation. Although there were two NGOs with capability and willingness for implementing the Project who proceeded for detailed discussion with the Team for the implementation, only one NGO called SFM (Swedish Free Mission) concluded the contract.

Main Features of the Contract

Subjects: 5 subjects of Building, Carpentry, Electrical Works, Metal Works, and Plumbing Works

Trainees: 80 youth residents (16 persons for each course) in Juba Town Area

Location: As shown in the map on the left

Duration

Training: From the middle of July 2006 to the middle of January 2007

Project: From the beginning of July 2006 to the middle of January 2007

(2) Implementation

1) Achievements

The training program commenced on September 11, 2002 with roofed space. Delay of commencement was almost 2 month compared to the one specified in the contract. Completion of the training program is extended to the end of February 2007.

Building Facility

The training center building was completed by the end of February 2007 with electricity supply. It shelters the training space and machineries from bad weather and theft.

Procurement of Tools and Machineries

Tools and machineries necessary for the training during the Project and further terms were procured in general except for items subject for wear and tear: A few additional items desired for implementation of the training programs were also purchased.

Work Item \ Year / Month	2006							2007	
	6	7	8	9	10	11	12	1	2
PREPARATRY									
Tool Procurement									
Material Procurement									
Building Construction/ Rehab.									
Instructors and Staff Recruit									
Training Course Prep.									
TRAINING PROGRAM									
Participant Recruit									
Basic Training									
Participation to Preparatory									
Specialized Training									
PERSONEL ASSIGNMENT									
Project Manager									
Logistics/Procurements									
Bookkeeper/Cahier									
Instructors									
Guards									
REPORTS			△ Monthly Report	△ Progress Report	△ Monthly Report	△ Monthly Report	△ Monthly Report	△ Completion Report	

Implementation Schedule

Trainees

80 youth residents in Juba of which more than 10% was female registered as the trainee. Among the registered trainees, 60 have completed the training: Building Section - 19, Carpentry Section - 8, Electrical Installation Section - 17, Metal Works Section - 4, and Plumbing Section - 12. Ten female trainees (Building - 5, Carpentry - 1, and Plumbing - 4) account for 17% of the entire completed trainees. Their knowledge level and literacy levels especially in English were diversified widely due to their educational backgrounds and the former education system employing Arabic.

Trainees

Training Program

Training programs were conducted with various conditions and manners. Performances of the programs were mainly dependent on the instructors' performances with certain degree on availabilities of machineries. Basically completed trainees acquired basic knowledge and skills in the respective fields with their satisfaction except for the particular section.

Organizational Establishment

Although the staffs and instructors were in position, the Project organization was not fully autonomous. The organization does not have sufficient capacity for management and/or coordination. Financial data processing and linkage of the result with the contract budget were not enough. Project documentation in terms of recording and reporting was in substandard level partly due to inexperience of the staff in use of computer.

Supporting Activities

SFM-Juba is conducting and/or planning the provision of job opportunities to the completed trainees mainly through their own construction and production activities.

2) Evaluation and Recommendation

Overall Assessment/ Achievement of the Project Purpose

The Project Purpose of "establishment of training programs to provide basic job oriented skills, which can be utilized for envisaged reconstruction works of Juba Town as the Capital of the Southern Sudan, to community people in Juba Town and surrounding areas for their livelihood improvement" was basically achieved with the completion of the building structure and of procurement and installation of major machineries by the end of the Project. SFM will be fairly ready for the implementation of the further terms of the training program.

Organizational Establishment

Basically adequate organizational structure has been established for the training program implementation while it has not been fully functioning. The defects of the organizational functioning have mainly been caused by the insufficient capacity and experience of the staff. Budget management capability of the project organization and SFM-Juba needs to be improved for executing the large scale new establishment of the organization with associated physical facility which involves massive procurement, while it may be enough to manage regularized activities.

Performance of the Training Programs

Although the performance of the training programs should be gauged by the completed trainees' performance in their own business or employment, it seems that the level of the respective acquired skills and knowledge by the completed trainees may satisfy minimum basic. It might be assessed that the basic efficacy of the training programs is demonstrated while there shall be many points to be improved.

Preliminary Recommendation

The following issues are recommended for the further activities of the training center:

- Acquisition of a capable key personnel
- Improvement in financial and budgetary management
- Continuous improvement of the training program in a) preparedness for the training, b) balanced approach in training program design among targeted trainees, skills and knowledge targets, and training period, and c) systematic approach for language problem in training delivery if necessary
- Enhancement of the instructors' capability
- Incorporation of income generating activity into the graining program
- Recruitment process to attain the targeted trainees
- Special consideration for employment of staff and instructors in competitive human resource market in Juba
- Concentration in enhancement of management and organizational capacity

Graduation Day (6 March 2007)

RECOMMENDATIONS

PLANNING/IMPLEMENTATION

1) Authorization of the Master Plan

It is vital for the basic physical and social infrastructure development plan formulated under this Study to be authorized as a master plan up to the year 2015, in order to systematically urge the reconstruction and development of Juba Town, integrating all efforts toward the same direction and target. The projects/ programs in the development plan should be reflected in the National/Regional Development Plans to make sure the implementation of the plan with budgetary arrangement.

2) Timely Conduct of Feasibility Studies

Since the master plan gives only concepts and major features of the projects, the details of the projects will be determined by feasibility studies. To materialize the proposed projects as scheduled, feasibility studies shall be timely conducted.

3) Securing/Raising of Funds

Realization of the development plan requires a huge amount of fund. Various measures for raising funds shall be examined and introduced including:

- Promotion of private sector investment is expected in the form of PPP or other similar scheme and sole private sector participation for the projects expected to gain revenue. Improvement of the environment for investment is vital, including market development, taxation preference policy, development of related infrastructure, and so on.
- Increase in tax revenue based on the beneficiary- pay principle and pay for damage and wear policies, and refurbishment of fare and taxation systems for public services, after examining their applicabilities.
- Effective utilization of communities' resources.

4) Adoption of Labour-based Construction

One of the ways of increasing job opportunities in the construction projects is to introduce the labour-based construction method for the projects suitable to apply this method, e.g. low class road construction/ maintenance. It is recommended to take measures to encourage the adoption of the labour-based method, such as stipulating in the conditions of contract that the use of equipment be restricted.

5) Execution of Adequate Maintenance

Adequate maintenance is very important for the following purposes and effects:

- To keep the facilities in good operational condition
- To prevent the facilities from deteriorating to the condition requiring extensive rehabilitation
- To prolong the usable life of the facilities
- As a result, to minimize the life cycle cost of the facilities

6) Promotion of Local Construction Industries

Encouragement of local construction industry is important for the social and economic development of the area. The following fields are possible to be developed:

- Consulting engineering services
- Construction
- Construction material supply
- Engineering survey
- Educational services
- Construction supporting services such as equipment lease, bond/insurance, financing/banking, etc.

To promote local construction industries, the following government interventions are desirable:

- To establish a construction equipment lease market
- To provide bond facilities to locally based enterprises of small to medium size
- To establish a financing system to locally based enterprises
- To conduct skill trainings and establish an official qualification system for special technicians, mechanics, equipment operators, etc.
- To introduce tenders giving preference or limited to locally based enterprises

It is a practical way to form joint ventures with foreign firms at first, and then gradually increase the share of local firms.

7) Amendment of the Plan

The master plan is formulated on the assumption of the future social and economic condition including population, extent of urbanized area, economic activities, urban structure, land use, etc. The plan shall be reviewed occasionally and adjusted according to the future change in social and economic condition.

ENVIRONMENTAL CONSIDERATIONS

8) Conduct of Social/Environmental Assessments

Environmental laws are to be formulated with the assistance by the United States. They shall be promptly applied in the project implementation. In the process of conducting the environmental impact assessment, public consultation or stakeholder meetings and information publication are important to build a public consensus on the project.

9) Considerations for Traffic Safety

When roads are constructed/improved, vehicles tend to travel at higher speed resulting in increase in traffic accidents. Safety measures are necessary to be taken, including installation of safety facilities, safety education and strengthening of traffic enforcement.

INSTITUTIONAL MATTERS

10) Enhancement of Administrative Organization

Present problems in administrative organization are:

- Demarcation of roles/duties between the Government of the Southern Sudan and State Governments as well as among Ministries is often ambiguous.
- Number of staff is inadequate to fully perform the duties.
- Most staff are not familiar with their works. Furthermore, the staff need to be increased but it will be difficult to employ experienced personnel.

For institutional improvement, required are establishment of adequate organization, reinforcement of the staff and capacity building of the staff.

11) Establishment of Project Implementation System

Standard procedures for securing the lands necessary for projects as well as the government organization for project implementation should be established for smooth implementation.

12) Taxation Preferences to Construction Equipment/Materials

Presently project costs are excessively high due to hyper-escalation of equipment/material prices mainly caused by high transportation cost. As one way to mitigate such escalation, transport routes should be improved and it is recommended to introduce the taxation preference policy to the imported equipment/materials, adopting tax and duty free policy in some cases.

13) Establishment of Land Market

Establishment of sound land market reflecting the economic value of land is essential not only for infrastructure development, but also for restriction/ inducement measures for realizing the land use plan and introduction of private sector investments. Therefore, development of the land market shall be a matter of urgency through review of relevant laws and identification of land rights.

COMMUNITY DEVELOPMENT

14) Formulation of Own Community Development Plan

Government should definitely establish the policy and strategy for community development, demarcating the roles of the governments and community, and take necessary measures for enhancement of the implementing capacity of the community.

It is desirable for each community to prepare its own community development plan along the government's basic policy for community development.

15) Coordination with Governments

The community development projects are composed of government-lead projects, community-lead projects and jointly implementing projects. The community should actively request the governments to forward the government projects, request to the government possible supports for the community projects, and closely negotiate with the governments on the joint projects.

16) Communities' Participation in Government Projects

In case of infrastructure development project which is a typical government-lead project, the community can participate in the following forms:

- Planning Stage: Actively indicate the opinions to be reflected in the project planning.
- Construction Stage: Provide the manpower, and organize a construction unit in the community and make a construction contract with the government.
- Operation/Maintenance Stage: For water/power supply projects, directly manage the operation by creating the proper organization like water management union in the community. For maintenance work, provide the manpower, and organize a maintenance unit in the community and be entrusted for maintenance work.

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