資　料　編

資料 1　　合同調整委員会開催記録
資料 2　　業務実施機材の譲渡品目リスト
資料 3　　業務指標（パフォーマンスインディケータ：PI）

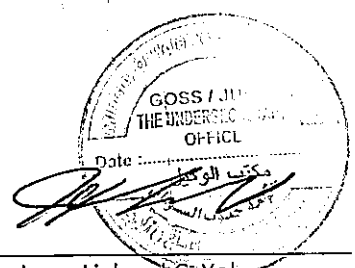
資料 1　　合同調整委員会開催記録

MINUTES OF MEETING
ON
FIRST JOINT COORDINATION COMMITTEE MEETING
FOR
THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTHERN SUDAN URBAN WATER CORPORATION IN SOUTHERN SUDAN

AGREED UPON BETWEEN

MINISTRY OF WATER RESOURCES AND IRRIGATION (MWRI) OF GOVERNMENT OF SOUTHERN SUDAN (GOSS)
AND
SOUTHERN SUDAN URBAN WATER COOPERATION (SSUWC)
AND
PROJECT TEAM OF JAPAN INTERNATIONAL COOPERATION AGENCY (JICA PROJECT TEAM)

JUBA, 19th NOVEMBER 2010



Eng. Isaac Liabwel C. Yol
Undersecretary,
MWRI, GOSS and
Chairperson of the JCC

Mr. Hirotaka Sato
Chief Advisor,
JICA Project Team

Eng. Chamjok Chung Wiitour
General Manager
Southern Sudan Urban Water Corporation (SSUWC)
Project Director

In line with the Scope of Work for THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTHERN SUDAN URBAN WATER CORPORATION IN SOUTHERN SUDAN (hereinafter referred to as "the Project"), Japan International Cooperation Agency (JICA) has dispatched the Project Team headed by Mr. Hirotaka SATO to Southern Sudan in order to commence the Study.

The Project Team submitted Inception Report (IC/R) of the Project and Work Plan for the first year to Ministry of Water Resources and Irrigation (MWRI) and Southern Sudan Urban Water Cooperation (SSUWC) and the first joint coordination committee (JCC) meeting was held in MWRI premises on 19th November, 2010 in order to discuss the contents of IC/R under the presence of the JICA Sudan Office. The list of participants is shown in the Annex-I.

The contents of IC/R including the first year's activities were presented by the Chief Advisor of JICA Project Team. As a result of series of discussions made with the Southern Sudan side, the Southern Sudan side in principle agreed the contents of the IC/R with the following comments.

- The appropriateness of the counterpart personnel which was agreed between the GOSS and JICA on March 2010 will be reexamined by General Manager, SSUWC and the results shall be notified to the JICA Project Team on 19th November.
- The Southern Sudan side feels that an training in the third country such as South Africa, Kenya or Uganda is important for the staff of UWC Juba station.
- The Southern Sudan side would like to have the recommendations and proposals on water tariff structure for individual customers and water tanker intake points. Currently, the water selling price for water tankers is cheap but individual customers pay a lot of money to tanker sellers. In addition, the seminars on water tariff shall be held ahead of schedule. The Southern Sudan side thinks the seminars in the third and fourth year are late.

It is agreed that the Southern Sudan side will do the required undertakings stated in the IC/R. The JICA Project Team confirmed that the Southern Sudan side would make the required assistance for import duty exemption of the equipment required for the Project that will be procured by the JICA Project Team.

Both sides agreed that the next JCC meeting will be held at the end of March or in early April, 2011 and the project indicators will be fixed.

Annex-1: Attendance List of the First Joint Coordination Meeting

ATTENDANCE LIST

THE FIRST JOINT COORDINATING COMMITTEE MEETING
FOR
THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTHERN SUDAN URBAN WATER CORPORATION IN SOUTHERN SUDAN

VENUE: MINISTRY OF WATER RESOURCES AND IRRIGATION (GOSS)
DATE: 19 Nov 2010
TIME: 11:00 – 14:00

No.	Name	Job Title	Mobile	E-mail Address
1	HE. Eng. Isaac Liabwel C. Yol	Undersecretary, MWRI Chairperson of JCC	+256-477127435	isaac.liabwel@gmail.com
2	HE. Mr. Chamjok Chung	General Manager, SSUWC HQ	+256-4771 52193	
3	Mr. Lawrence Lopula Busuk Muludyang	Director for Urban Water Supply Programmes, MWRI	+249-955471410	Itongun@gmail.com muludyangl@yahoo.com
4	Mr. Zacharia Joseph	S/ inspector, MWRI	0915158177	zacpitialagu@yahoo.com
5	Mr. Khor Guang Loa	Project Director, SSUWC HQ	0955000529 0121804879	khorlos@yahoo.com
6	Mr. Santurino Tongun	Director / Planning, SSUWC HQ	0928938419	
7	Mr. Samuel Taban Longa	Area Manager, SSUWC, Juba	+256-477164443	
8	Mr. Alexander Dalson Hakim	Director, SSUWC Juba	0926766533	
9	Mr. Killaiens Lokuji	Director, SSUWC Juba		
10	Mr. Elfateh Rihan	O&M Manager, SSUWC Juba	0129567491	
11	Mr. Sebit Lado Silvano	Manager for Laboratory, SSUWC Juba	0126698924	
12	Mr. Kiyotaka Tamari	Project Formation Advisor, JICA		
13	Mr. Hirotaka Sato	Chief Advisor, Project Team		
14	Mr. Masashi kawamura	Member, JICA Project Team		
15	Mr. Hayato Nakazono	Member, JICA Project Team		

MINUTES OF MEETING
ON
SECOND JOINT COORDINATION COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTHERN SUDAN URBAN WATER CORPORATION IN SOUTHERN SUDAN

AGREED UPON BETWEEN

MINISTRY OF WATER RESOURCES AND IRRIGATION (MWRI) OF THE GOVERNMENT OF SOUTHERN SUDAN (GOSS)
AND
SOUTHERN SUDAN URBAN WATER COOPERATION (SSUWC)
AND
PROJECT TEAM OF JAPAN INTERNATIONAL COOPERATION AGENCY (JICA PROJECT TEAM)

JUBA, 7th APRIL 2011

Eng. Isaac Liabwel C. Yol
Undersecretary,
MWRI, GOSS and
Chairperson of the JCC

Mr. Hirotaka Sato
Chief Advisor,
JICA Project Team

Eng. Chamjok Chung Wiitour
General Manager
Southern Sudan Urban Water Corporation (SSUWC)
Project Director

In line with the Scope of Work for THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTHERN SUDAN URBAN WATER CORPORATION IN SOUTHERN SUDAN (hereinafter referred to as "the Project"), Japan International Cooperation Agency (JICA) has dispatched the project team headed by Mr. Hirotaka SATO.

The JICA Project Team and the Counterpart Team comprised of Ministry of Water Resources and Irrigation (MWRI) and Southern Sudan Urban Water Cooperation (SSUWC) held the second Joint Coordination Committee (JCC) meeting at Juba Grand Hotel on 4th April, 2011 in order to explain and discuss the contents of the progress of the project under the presence of the representative of the JICA Sudan Office. The list of participants is shown in Annex-I.

In the meeting, the JICA Project Team submitted the Draft Progress Report (DP/R) of the project to the Counterpart Team in the meeting. The agenda of the meeting was to explain the progress of the 1st year term of the project and expecting activities in the next year term, and determination of performance targets for the project. The progress of the project and contents of DP/R were presented by the JICA project team members. The Counterpart Team understood the progress of the project and both side shared the current situation of SSUWC and their problems. The following are comments of the counterpart team.

- To operate the purification plant for 24 hours under the current frequent power cut situation, a hot line from the power supply company to the plant is required. The target values of 23.5 hours for plant operation hours were agreed if 2 generators, one of which was currently under repair, were operational.
- To control water distribution flow in the city and repair leakage without interruption of the purification plant operation, zone valves are required. The counterpart requested the Project Team to consider these valves. The Project Team replied that a plan of water supply zoning will be prepared at the next stage, in which the location of zoning valves will be planned.
- The counterpart of the laboratory section mentioned that micro-biological test was required and the capacity for this would be strengthened in future. The Project Team replied that it was difficult to introduce micro-biological equipment in the existing laboratory. However, test kit might be feasible. In any case, in the first instance, residual chlorine should be strictly controlled so that microorganism was not occurred.
- The counterpart team understood that the leakage control was of most importance for the very old asbestos pipes buried in the city and requested the Project Team to include leakage control program. The project replied that it was difficult to include in the current project. However, we would introduce the adequate process of leakage repair for prompt repair.
- The counterpart team understood that the outcomes of the project were very useful and these should be introduced to the other towns of SSUWC.
- The counterpart understood that once they understood the current conditions of water supply

services and the report was prepared, they could sell it and found financial source for further improvement.

In the meeting, the target values of project indicators were also discussed by both sides and decided as shown in Annex-2. After the meeting, a discussion on the project target of transmission and distribution was made with distribution department and the following target was finally agreed. The number of staff who acquired adequate O&M skills for transmission and distribution increases from 0 to 10 persons.

Finally, the Counterpart Team appreciated the works done by the JICA Project Team.

Annex-1: Attendance List of the Second Joint Coordination Meeting

VENUE: JUBA GRAND HOTEL
DATE: 4 APR 2011
TIME: 14:00 – 16:30

MWRI (3)

Eng. Isaac Liabwel C. Yol	Undersecretary, MWRI, GOSS /Project Chairperson
Eng. Emmanuel Parmenas	AG Director of Planning
Eng. Zacharia Joseph	Senior Inspector

SSUWC HQ's (5)

Eng. Chamjok Chung	General Manager /Project Director
Eng. Joseph Ebere Amosa	Technical Advisor
Mr. Simon Koak	Office Manager
Eng. Khor Guang Loa	Project AG Director
Mr. Biel Nyuot Nhial	Administrative Officer

SSUWC Juba Station (8)

Eng. Santurino Tongun	AG Area Manager /Project Manager
Mr. William Lokuji	AG Administration Director
Eng. Peter Toburo Nigo	AG Distribution Director
Eng. Cienggan Mading	H/ W/ Distribution
Mr. Elfateh Rihan	Purification Engineer
Mr. Sebit Ladu	S/ Lab/ Technician
Mr. Julius Mobruk	H/ Electrician
Mr. Alison Mobrouk Brown	S/ Inspector Ledger Keeper

JICA (2)

Kenichi Shishido	Resident Representative
Kiyotaka Tamari	Project Formulation Advisor

JICA Expert Team (7)

Hirotaka Sato	Chief Advisor
Yarai Sato	Expert for purification plant and pump O&M
Masashi Kawamura	Expert for transmission and distribution O&M
Moriji Yanagimura	Expert for water quality management
Atsuo Ono	Expert for financial analysis
Steven S. Mukiibi	Expert for community development
Hayato Nakazono	Coordinator / Expert for community development

Annex-2: Project Indicators

The target values of project indicators have been determined in the following table. These targets shall be achieved at the end of the Project, i.e., August 2013.

Project Narrative Summary	Objectively Verifiable Indicators
Overall Goal: 1. SSUWC-Juba station is managed in a planned way. 2. The management capacity of SSUWC is improved.	1. The customer satisfaction on water supply service of SSUWC-Juba station is enhanced. 2. The number of day in a month that the quality of supplied water at the sampling points in Juba complies with the water quality standard with respect to turbidity (less than 3 NTU) and residual chlorine (0.2 mg/l ~ 0.6 mg/l) increases from about 90 % to 100 %, and about 10 % to 80 %, respectively. 3. The reports and plans stipulated by SSUWC HQ are periodically submitted by other 3 station(s) and the number of discussions on the reports and plans becomes 4 times/ year.
Project Objective The management capacity of SSUWC -Juba station is enhanced through capacity development on operation and maintenance of water supply facilities.	1. The number of day in a month that the quality of supplied water at the sampling points in Juba complies with the water quality standard with respect to turbidity (less than 5 NTU) and residual chlorine (0.2 mg/l ~ 0.6 mg/l) increases from about 90 % to 100 %, and about 10 % to 70 %, respectively. 2. The number of days in a month that water supply (volume) in a day to the sampling points in Juba complies with the O&M plan becomes 20 days.
Output: 1. Capacity of SSUWC-Juba station with respect to operation and maintenance of water intake and treatment facilities is improved.	1-1 Monthly reports and annual reports in which O&M data is compiled. 1-2 Annual O&M plan on water purification plant. 1-3 The number of staff who acquired adequate O&M skills for WTP increases from 0 to 11 persons. 1-4 The average operation hour of WTP increases from about 22 hours to 23.5 hours/day. 1-5 The ratio that the quality of treated water with respect to turbidity is below 5 NTU increases from about 90 to 100 %. 1-6 The ratio that the quality of treated water with respect to residual chorine falls in the range between 0.7 and 1.2 mg/l increases from about 10 % to 80 %.
2. Capacity of SSUWC-Juba station with respect to operation and maintenance of water transmission and distribution facilities is improved.	2-1 Monthly reports and annual reports in which O&M data is compiled. 2-2 Annual operation and maintenance plan on O&M of water transmission and distribution facilities. 2-3 The number of staff who acquired adequate O&M skills for transmission and distribution increases from 0 to 10 persons. 2-4 The operation hour of pumps falls in the range of plus or minus 10 % of the planned pump operation hours in the O&M plan prepared in the project on average of all pumping stations.
3. Capacity of water quality management of SSUWC-Juba station is improved.	3-1 Water quality management report (monthly and annual) in which water quality monitoring data is compiled. 3-2 The number of staff who acquired adequate water quality test skills increases from 0 persons to 2 persons.
4. Understanding of financial conditions of SSUWC-Juba station is enhanced.	4-1 Revenue collection reports. 4-2 Recommendations on revenue collection improvement. 4-3 Establishment of management method of public water tap stands.
5. Capability of SSUWC HQ to support SSUWC-Juba station is enhanced.	5-1 The number of monthly reports that SSUWC HQ examined becomes 18 months. 5-2 The number of annual reports and plans that SSUWC HQ examined becomes 2 each. 5-3 Database of SSUWC HQ on the existing water supply facilities and services

MINUTES OF MEETING
ON
THIRD JOINT COORDINATION COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTH SUDAN URBAN WATER CORPORATION IN SOUTH SUDAN

AGREED UPON BETWEEN

MINISTRY OF WATER RESOURCES AND IRRIGATION (MWRI)
OF THE GOVERNMENT OF SOUTH SUDAN (GOSS)
AND
SOUTH SUDAN URBAN WATER COOPERATION (SSUWC)
AND
PROJECT TEAM OF JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA PROJECT TEAM)

JUBA, 15th November 2011

Eng. Isaac Liabwel C. Yol	Eng. Chamjok Chung Wiitour	Mr. Hirotaka Sato
Undersecretary	Managing Director	Chief Advisor
Ministry of Water Resources and Irrigation,	South Sudan Urban Water Corporation	JICA Project Team
Government of South Sudan		

In line with the Scope of Work for THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTH SUDAN URBAN WATER CORPORATION IN SOUTH SUDAN (hereinafter referred to as "the Project"), Japan International Cooperation Agency (JICA) has dispatched the project team.

The Project is now in the second year term. The JICA Project Team submitted the Progress Report (P/R) for the Project to the Counterpart Team on 11th November in 2015.

The JICA Project Team and the Counterpart Team comprised of Ministry of Water Resources and Irrigation (MWRI) and South Sudan Urban Water Cooperation (SSUWC) held the third Joint Coordination Committee (JCC) meeting at New York Hotel on 15th November, 2011 in order to explain and discuss the progress of the Project under the presence of the representative of the JICA South Sudan Office. The list of the participants is shown in Annex-I.

The agenda of the meeting was to explain the progress and outcomes in the 2nd year term of the project, problems and bottlenecks, and remaining activities in the 2nd year term until March 2012. The progress of the project and contents of P/R were presented by the JICA project team members. The both sides understood the progress of the project and both sides shared the current situation of SSUWC and their problems.

The both sides discussed on the progress and bottlenecks/problems for the project and understood that the project does not have any significant bottleneck to be solved. Only one thing to be solved is the space for training room. The existing training room was recently occupied for other purpose. The General Manager/Project Director promised to find the suitable space for the training room. Finally, the both sides confirmed that the current progress is on track and the project shall continue according to the original plan for the second year term and as scheduled. In addition, the Undersecretary/Chairperson recommended that bottlenecks/problems shall be differentiated and the administrative issues shall be solved by General Manager and technical ones by Juba station and project team. Finally, the Counterpart Team appreciated the works done by JICA Project Team. The outline of the issues discussed is shown below.

- Insufficient English and arithmetic ability of UWC staff were pointed out and acquisition of these abilities requires considerable time. The project team answered we understood the importance of these ability, but these insufficiencies can be supplemented by the team work each together. Anyway, Juba station will start English training supported by the project team and the project team has been teaching basic arithmetic as far as time is available.
- Multiple management types shall be tried for management of the public tap stands constructed. The project team answered that we will adopt the most suitable type selected based on the evaluation results of existing public tap stand management.
- The current training for the laboratory is to improve chemical and physical analysis ability. The

Counterparts understood the capacity building for water quality analysis would be complete when the laboratory acquires chemical, physical and biological analysis abilities.

- MWRI is establishing the urban water database. The data collected from local stations by the project team shall be shared with them for the database.
- The MWRI has the mandate to ensure safe drinking water. MWRI thinks the monthly meeting with SSUWC and the project team is of importance to understanding the performance.
- The both sides confirmed that the target of the Project would be aimed at operation and management of the Japan's grant aid facilities.
- The board of directors for SSUWC will be formed. The project team shall identify the area of development that may be raised in the board meeting.

Annex1: Attendance List of the 3rd Joint Coordination Meeting

VENUE: NEW YORK HOTEL
DATE: 15 NOV. 2011
TIME: 15:30 – 18:00

MWRI (2)

Eng. Isaac Liabwel C. Yol	Undersecretary, MWRI, GOSS/ Project Chairperson
Eng. Zacharia Joseph	Senior Inspector

SSUWC Juba Station (9)

Eng. Chamjok Chung	General Manager
Mr. Simon Koak	Office Manager

SSUWC Juba Station (9)

Eng. Santurino Tongun	AG Area Manager / Prject Manager
Eng. Hassan Aggrey Yousif	Deputy Area Manager
Mr. William Lokuji	AG Administration Director
Mr. El-Fetech Rihan	Purification Engineer
Mr. Sebit Ladu Silvano	S/ Lab/ Technician
Eng. Cieggan Madding	H/ W/ Distribution
Mr. Kenneth Gideon Dakaya	S/ Inspector/ Budget
Mr. Frederick Wani	S/ Inspector/ Stores
Mr. Morris Emmanuel	Book Keeper

JICA (2)

Atsushi Hanatani	Resident Representative
Kyohei Miyoshi	Assistant Resident Representative

JICA Expert Team (5)

Hirotaka Sato	Chief Advisor
Yarai Sato	Expert for purification plant and pump O&M
Masashi Kawamura	Expert for transmission and distribution O&M
Atuo Ohno	Expert for financial analysis
Hayato Nakazono	Coordinator / Expert for community development

MINUTES OF MEETING
BETWEEN
THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF SOUTH SUDAN
AND
JAPAN INTERNATIONAL COOPERATION AGENCY
ON
JAPANESE TECHNICAL COOPERATION PROJECT
FOR
THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTH SUDAN URBAN WATER CORPORATION IN THE REPUBLIC OF SOUTH SUDAN

The Mid-Term Review Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") visited the Republic of South Sudan (hereinafter referred to as "South Sudan") from February 6th to 22nd, 2012 for the purpose of reviewing the progress and the achievements of the Project for Management Capacity Enhancement of South Sudan Urban Water Corporation in the Republic of South Sudan (hereinafter referred to as "the Project").

During its stay in South Sudan, the Team visited the Ministry of Water Resources & Irrigation (hereinafter referred to as "MWRI") and South Sudan Urban Water Corporation (hereinafter referred to as "SSUWC") and exchanged views and opinions with stakeholders on the Project. As a result of discussions, both parties agreed on the matters referred to in the attached Joint Mid-Term Review Report.

Juba, February 22nd, 2012

Mr. Junji Wakui
Leader
Mid-Term Review Team
Japan International Cooperation Agency

Eng. Issac Liabwel C.Yol
Undersecretary
Ministry of Water Resources & Irrigation

Eng. Chamjok Chung
General Manager
South Sudan Urban Water Corporation

MINUTES OF MEETING
ON
FOURTH JOINT COORDINATION COMMITTEE (JCC) MEETING
FOR
THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTH SUDAN URBAN WATER CORPORATION IN SOUTH SUDAN

AGREED UPON BETWEEN

MINISTRY OF WATER RESOURCES AND IRRIGATION (MWRI) OF THE GOVERNMENT OF SOUTH SUDAN (GOSS)
AND
SOUTH SUDAN URBAN WATER COOPERATION (SSUWC)
AND
PROJECT TEAM OF JAPAN INTERNATIONAL COOPERATION AGENCY (JICA PROJECT TEAM)

JUBA, 29th November 2012

Eng. Isaac Liabwel C. Yol	Eng. Chamjok Chung Wiitour	Mr. Hirotaka Sato
Undersecretary	Managing Director	Chief Advisor
Ministry of Water Resources and Irrigation,	South Sudan Urban Water Corporation	JICA Project Team
Government of South Sudan		

In line with the Scope of Work for THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF SOUTH SUDAN URBAN WATER CORPORATION IN SOUTH SUDAN (hereinafter referred to as "the Project"), Japan International Cooperation Agency (JICA) has dispatched the project team.

The Project is now at the end of third year term and the project completion seminar for this year term was held with attendance of JICA, Project Counterparts comprised of Ministry of Water Resources and Irrigation (MWRI) and South Sudan Urban Water Cooperation (SSUWC), and Donor Agencies at New York Hotel on 29th November 2012. In the seminar, the summary of project activities and their outcomes are explained by JICA Project Team and Project Counterparts.

Following the seminar, the Project Team and the Counterpart Team held the Fourth Joint Coordination Committee (JCC) meeting under the presence of the representative of the JICA South Sudan Office in order to discuss problems, bottlenecks, and major activities in the 4th year term until September 2013. The list of the participants in JCC meeting is shown in Annex-I.

At first, modification of a target value of the indicators of the Project was proposed as follows.

- ✧ Target range of residual chlorine in the clear water tank in Juba station shall be changed from 0.6 - 1.2 mg/l to 1.5 - 2.0 mg/l, based on the observation of high chlorine demand consumption in distribution system including pipelines and tanks. The proposal was agreed by the JCC members.

Then, Chief Advisor requested JCC to strengthen the following parts.

- ✧ The implementation of Annual Action Plan (2012/13) for Juba Station shall be expedited. For this purpose, more commitment of staff and budget management are required.
- ✧ Periodical meeting shall be held with other stations by initiative of the Headquarter to discuss the issues of each station.
- ✧ For monitoring and advisory purpose, more involvement of MWRI in management of SSUWC is required.

These requests were understood by the JCC members and enhancement of these parts was agreed.

In addition, the following recommendations were made by Chief Advisor.

- ✧ Expedite adoption of Metered Rate for Increasing Revenue of SSUWC and transparency of water charge for the citizen
- ✧ Adopt the system established for Juba station to other stations, along with preparation of Action Plan for Headquarter

Furthermore, the requests from JCC members made as follows.

- ✧ The Project manager requested training for the detailed design of the facilities of Grant Aid Project and training for leakage control.
- ✧ A JCC member requested long term training in KEWI.
- ✧ A JCC member requested a permanent laboratory.

Finally, following activities in the next year's term was agreed.

1. Monitoring of the Working Process by JICA project team and Improvement of Process by Counterpart Team
    - O&M of facilities
    - Water Quality (esp. residual chlorine)
    - Sales (increase revenue)
    - HQ management (Annual, monthly report evaluation, other station's database)
2. Modification of revenue collection software for Flat rate and Metered rate
3. Improvement of transportation means and communication tools
4. Final Evaluation for the Project by JICA in April or May in 2013

Annex1: Attendance List of the 3rd Joint Coordination Meeting

VENUE: NEW YORK HOTEL

DATE: 29 NOV. 2012

TIME: 9:30 – 13:30

Organization			Name
MWRI			Isaac Liabwel C. Yol (Project Chairman)
SSUWC	Headquaters		Chamjok Chung (Project Director)
			Olwak Mugo
			Khor Guang Loa
			Chrisphine Abugo
	Juba		Santurino Tongun (Project Manager)
		Administratior	William Lokuji
			Roda Misaka
			Christine Moyo
		Accounting	Alexander Dalsor Hakim
			Kenneth Gideon Dakaya
			Morris Emmanuel
		Purification	David Wani
			El-Fetech Rihan
			Sebit Ladu Silvano
			Peter Toburo Nigo
			Martin Rume Olimpio
			John Brown
			George Wani
			Sebit Marko
		Distribution	Hassan Aggrey Yousif
			Cienggan Mading
			Christopher Philip
			Jonthana Winston
			Repent Monday
			Mujung Justin
JICA	JICA Expert Team and Assiatant		Hirotaka Sato (JICA Chief Advisor)
			Hayato Nakazono
			Manyok
			Jura Festo
	JICA		Atsushi Hanatani (Chief Representative)
			Tomoki Kobayashi
			Kyohei Miyoshi

MINUTES OF MEETING
BETWEEN
THE AUTHORITIES CONCERNED OF
THE GOVERNMENT OF THE REPUBLIC OF SOUTH SUDAN
AND
JAPAN INTERNATIONAL COOPERATION AGENCY
ON
JAPANESE TECHNICAL COOPERATION
FOR
THE PROJECT FOR MANAGEMENT CAPACITY ENHANCEMENT OF
SOUTH SUDAN URBAN WATER CORPORATION
IN THE REPUBLIC OF SOUTH SUDAN

The Japanese Terminal Evaluation Team (hereinafter referred to as "the Team"), organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") headed by Mr. Tatsuya Imai, visited the Republic of South Sudan (hereinafter referred to as "South Sudan") from May 20th to June 6th, 2013, for the purpose of conducting terminal evaluation of the "the Project for Management Capacity Enhancement of South Sudan Urban Water Corporation in the Republic of South Sudan (hereinafter referred to as "the Project").

During its stay, the Team and the South Sudanese side formulated the Joint Evaluation Team, conducted a field survey, exchanged views and had a series of discussions with the South Sudanese authorities concerned. As a result of the discussions, the Team submitted the terminal evaluation report as attached and both sides agreed upon the description of the report.

Juba, June 5th 2013

THE REPUBLIC OF SOUTH SUDAN
Office of the Undersecretary
Date:
MINISTRY OF WATER RESOURCES AND IRRIGATION

Mr. Tatsuya Imai
Leader
The Terminal Evaluation Team
Japan International Cooperation Agency

~~Mr. Laurence Muludyang~~, Mr. Isaac Liabwel
~~Director of Urban Water Programs~~ Undersecretary
Ministry of Water Resources & Irrigation

Eng. Chamjok Chung Wiitour
General Manager
South Sudan Urban Water Corporation

Joint Terminal Evaluation Report

on

The Project for Management Capacity Enhancement of South Sudan Urban Water Corporation

June 5, 2013

List of Abbreviations and Acronyms

Abbreviation	Official Name
C/P	Counterpart
GIS	Geographic Information System
GIZ	German International Cooperation Agency
GPS	Global Positioning System
HQ	Headquarters
IDP	Internal Displaced Person
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
M/M	Minutes of Meeting, Man Month
MDTF	Multi Donor Trust Fund
MFEP	Ministry of Finance and Economic Planning
MWRI	Ministry of Water Resources and Irrigation
OVI	Objectively Verifiable Indicator
O&M	Operation and Maintenance
PDM	Project Design Matrix
PI	Performance Indicator
PO	Plan of Operations
R/D	Record of Discussion
ROSS	Republic of South Sudan
SIP	Small Infrastructure Project
SOP	Standard Operational Procedure
SSDP	South Sudan Development Plan
SSP	South Sudanese Pound
SSUWC	South Sudan Urban Water Corporation
SUWASA	Sustainable Water and Sanitation in Africa
TCP	Technical Cooperation Project
TICAD	Tokyo International Conference on African Development
USAID	United States Agency for International Development
USD	United States Dollars
UWC	Urban Water Corporation
WB	World Bank
WTP	Water Treatment Plant

Table of Contents

1. Introduction

1-1. Background and Purpose of the Evaluation

(1) Background of the Evaluation

The Project for Management Capacity Enhancement of South Sudan Urban Water Corporation (hereinafter referred as "the Project") is a bilateral technical cooperation project between the Government of Japan (through the Japan International Cooperation Agency: JICA), and the Government of South Sudan (through the Ministry of Water Resources and Irrigation: MWRI). The Project was launched in October 2010 for the duration of three years. As the end of the project period is approaching (September 2013), as laid out in the Record of Discussions (R/D) signed on the 8th of July 2010 by both governments, the terminal evaluation of the Project was conducted by the Joint Terminal Evaluation Team (hereinafter referred to as "the Terminal Evaluation Team"), comprised of representatives from both sides.

(2) Purpose of the Evaluation

The purposes of the evaluation are as follows:

1) To confirm the achievement levels of Inputs and Outputs and the prospect for the Project Purpose to be achieved by the end of the project period, and the Overall Goals within three to five years after the project completion, based on the Project Design Matrix (PDM) version 3 (see Annex 7);

2) To identify factors or issues that have promoted or hindered the implementation of project activities;

3) To conduct a comprehensive evaluation from the viewpoints of five evaluation criteria; Relevance, Effectiveness, Efficiency, Impact and Sustainability (see 2-2 "Criteria of the Joint Terminal Evaluation" for their definitions);

4) To draw up recommendations of the measures to be taken for the Project's further improvement and identify lessons learned to be referred to by similar JICA projects; and

5) To discuss and agree on the direction of the Project and prepare a joint terminal evaluation report based on the results of the discussions.

1-2. Members and Schedule of the Evaluation

(1) Members of the Evaluation

The members of the Terminal Evaluation Team are as follows:

1) Japanese Side

Name	Title	Position/Organization
Mr. Tatsuya Imai	Leader	Director, Water Resources Management Division 2, Water Resources and Disaster Management Group, Global Environment Department, JICA
Mr. Yoshiki Omura	Water Supply Management	Senior Advisor, Water Supply Development, JICA
Mr. Tadashi Kageyama	Planning Management	Deputy Director, Water Resources Management Division 2, Water Resources and Disaster Management Group, Global Environment Department, JICA
Ms. Miku Watanabe	Evaluation and Analysis	Consultant, IMG Inc.

2) South Sudanese Side

Name	Title	Position/Organization
Mr. Simon Koak	Office Manager	SSUWC HQ (Output 5)
Eng. Santurino Tongun	Director, Commercial and Customer Services	SSUWC HQ (Project Manager)
Mr. Peter Tuburo	Director, Department of Planning and Projects	SSUWC Juba Station (Project Planning)

(2) Schedule of the Evaluation

The Evaluation was conducted from the 20th of May to the 6th of June 2013 (see Annex 1 for the Evaluation Schedule.)

1-3. Outline of the Project

(1) Background of the Project

In Sudan, after more than two decades of conflict between the government and the Sudan People's Liberation Movement (SPLM), the Comprehensive Peace Agreement (CPA) was signed and the Southern Sudan established an interim government in January 2005. The population of Juba, the capital of the Southern Sudan, has been rapidly increasing with a bulk of internally/internationally displaced people (IDP) returning and is now estimated to be around 400,000. As little maintenance work has been conducted for urban infrastructures due to the conflict, many facilities have become old and the service provision function has significantly decreased.

The South Sudan Urban Water Corporation's (SSUWC) Juba Station (164 staff members) is responsible for operating and maintaining water supply facilities in Juba consisting of water treatment, transmission and distribution facilities and collecting water bills. The Juba Station, however, faced difficulties in distributing safe water in an efficient manner due to the absence of: the knowledge and skills for the proper operation and maintenance of water supply facilities; timely and appropriate measures for operation and maintenance; the inspection and verification process of supplied water quality; an up-to-date customer ledger; a management system for equal water distribution; and necessary maintenance materials and budget, coupled with the degraded facilities. The Juba Station did not generate enough revenue to cover all the necessary expenses for the operation of water supply facilities.[1] A low flat-rate system has been employed without clear valuation of the water supply cost or a proper water tariff policy. The bill collection system with handwritten ledgers was considerably inefficient.

SSUWC Headquarters (HQ) (38 staff members) is responsible for securing and distributing the government budget to area stations, and providing guidance and supervision on technical issues of the area stations. However, HQ was not able to provide appropriate instructions or support to area stations due to the lack of a clear institutional framework for information collection on the status of area stations' facilities and activities as well as sufficient mutual consultation between HQ and area stations.

Under these circumstances, there was an imminent need for a technical cooperation project to enhance the SSUWC Juba Station's operation and maintenance capacity for water supply services. In response to the request from the Southern Sudanese side, a mission for detailed planning was carried out from February to March 2010 and the project outline was developed with MWRI being the executing organization and SSUWC HQ and the Juba Station being the target organizations. In July 2010, the Record of Discussions (R/D) was signed between the Ministry of Finance and Economic Planning (MFEP), which represents the Government of Southern Sudan (then) for the Project, and the Resident Representative of the JICA Sudan Office. According to the R/D, the Project is carried out for the period of three years from October 2010.

[1] The Republic of South Sudan (ROSS) provides SSUWC with the budget for salaries and allowances, chemicals (in-kind) and fuel for generators (in-kind). Due to the budget cut under the fiscal austerity since July 2012, ROSS has suspended the provision of chemicals and fuel for generators and cut the salary expenditure in half. In exchange, the SSUWC's remittance to the government, which was originally 80% of the income from water bills, was reduced to 20% in July 2012, and 0% in April 2013. According to the Project Report, the Juba Station's monthly revenue from water bills in the fiscal year 2011/2012 was SSP 86,369 on average. SSUWC is currently operating its water supply facilities mostly from its own revenue although its level is still minimal.

(2) Summary of the Project

Overall Goals	1. The quality of the water supply service extended by SSUWC-Juba is improved 2. The management capacity of SSUWC is improved
Project Purpose	The management capacity of SSUWC -Juba Station is enhanced through capacity development on operation and maintenance of water supply facilities.
Project Outputs	1. Capacity of SSUWC-Juba Station with respect to operation and maintenance of water intake and treatment facilities is improved. 2. Capacity of SSUWC-Juba Station with respect to operation and maintenance of water transmission and distribution facilities is improved 3. Capacity of water quality management of SSUWC-Juba Station is improved. 4. Understanding of financial conditions of SSUWC-Juba Station is enhanced 5. Capability of SSUWC HQ to support SSUWC-Juba Station is enhanced
Project Period	From October 2010 to September 2013 (Three years)
Implementing Agency	SSUWC Headquarters and SSUWC Juba Station

2. Methodology of the Evaluation

2-1. Framework

In accordance with the *New JICA Guidelines for Project Evaluation* (the First Edition, 2010), the Terminal Evaluation Team evaluated the Project, taking the following steps:

Step 1. Prepare an evaluation grid that lists evaluation questions, data/information necessary for evaluation and information sources;

Step 2. Collect data and information necessary for the evaluation;

Step 3. Assess the Project's achievements in reference to the PDM ver. 3;

Step 4. Analyze the factors that promoted or inhibited the Project's achievements, including factors relating to the project design and the project implementation process.

Step 5. Analyze the Project from the viewpoints of five evaluation criteria, defined in 2-2 "Criteria of the Joint Terminal Evaluation";

Step 6. Draw up recommendations from the analysis;

Step 7. Share the preliminary evaluation results with stakeholders and discuss the future directions of the Project; and

Step 8. Reach an agreement on the evaluation results between the Japanese and South Sudanese sides.

2-2. Criteria of the Evaluation

Five evaluation criteria used in the evaluation are defined as follows:

Relevance	Relevance is assessed in terms of the Project's validity in relation to the development policy of the South Sudanese Government at the evaluation stage, Japan's Official Development Assistance (ODA) policy, and the needs of the Project beneficiaries, as well as the appropriateness of the project approach to address the needs.
Effectiveness	Effectiveness is assessed based on the prospect of achieving the Project Purpose by the end of the project period and whether this is due to the Project's Outputs.
Efficiency	Efficiency is assessed by focusing on the relationship between Outputs and Inputs in terms of timing, quality and quantity of Inputs. It measures to what extent Project Inputs have economically been converted into Outputs in consideration of the achievements of both Inputs and Outputs.
Impact	Impact is assessed based on the prospect of achieving the Overall Goals within three to five years of the project completion and the positive and negative changes have been produced, directly or indirectly as a result of project implementation.

Sustainability	Sustainability is assessed in terms of institutional, organizational, financial and technical aspects, by examining the extent to which the achievements of the Project will be maintained or further expanded by the South Sudanese side after the project period.

2-3. Evaluation Grid and Data Collection Methods

(1) Evaluation Grid

The Team evaluated the Project based on the evaluation questions listed in the evaluation grid (see Annex 4 for the list of evaluation questions and evaluation results of the questions.). The evaluation grid is comprised of three sections: (1) Project achievements; (2) Implementation Process; and (3) Evaluation by the Five Criteria.

(2) Data Collection Methods

The following sources of information and data were used in the joint terminal evaluation:

1) Interviews with and/or questionnaires' answers from stakeholders at SSUWC HQ, the Juba Station, MWRI as well as development partners (see Annex 2 "List of Interviewees");
2) Documents agreed upon by both sides prior to and/or during the course of the Project implementation;
3) Records of inputs from both sides and activities of the Project (see Annex 3 "Inputs") ;
4) Site visits (SSUWC Juba Station, pumping stations, public tap stands, tanker filling stations);
5) Documents that provide data and information indicating the degree of achievements of the Project Outputs, Project Purpose, and Overall Goals, and
6) Policy documents that show the project's relevance and sustainability.

3. Performance and Implementation Process of the Project

3-1. Performance of the Project

3-1-1 Inputs

(1) Japanese Side

The Japanese side provided the following inputs to the Project (see Annex 3-1 "Inputs by the Japanese Side" for details.).

1) Assignment of Experts

The Japanese side has assigned eight experts to the Project. The expertise and assigned periods of experts are the following. (see Annex 3-1-1 "Assignment of Experts").

Table 1. Expertise and Assigned Period of Experts

Expertise	Number (Person)	Assigned period (M/M)
Chief Advisor/Water Utility Management	1	12.90
Water Treatment Plant /Pumping Facilities Operation and Maintenance (1)	1	9.84
Pumping Facilities Operation and Maintenance (2)	1	1.00
Transmission and Distribution Facilities Operation and Maintenance	1	12.53
Water Quality Management	1	9.47
Financial Evaluation/Water Tariff	1	9.60
Community Development (1)	1	7.60
Coordinator/Community Development (2)	1	11.26
Total	8	74.20

2) Training in Japan and the Third Country

The Japanese side has provided overseas training to 53 staff members (6 people in Japan, and 47 people in Kenya) from MWRI, SSUWC HQ, the Juba Station, the Wau station and the Malakal station (see Annex 3-1-2 "Training in Japan and the Third Country").

3) Provision of Equipment and Materials

The Japanese side has provided equipment necessary for O&M of facilities (e.g. water quality test kit, chlorine injector, and flow meters), motor bikes, office supplies and equipment (e.g. a photocopier, desktop computers, and printers), and other machinery and equipment necessary for the implementation of the Project, which amounted to USD 220,829 (see Annex 3-1-3 "Provision of Equipment and Materials").

4) **Construction of Public Water Tap Stands and Flow Meter Chambers**

The Japanese side has constructed three public tap stands and 11 chambers for flow meters, which amounted to USD 124,899 (see Table 2 below).

Table 2. Construction Cost of Public Taps and Flow Meter Chambers

Item	Quantity	Amount (USD)
Public taps	3	75,530
Chambers for flow meters	8	19,643
Chambers for flow meters	3	11,944
Fence	7	17,782
Total	21	124,899

5) **Operational Expenses by Japanese Side**

The Japanese side has allocated the total amount of JPY 22,066,702 (Approximately USD 219,351) for the operational costs of project activities (see Annex 3-1-4 "Operational Expenses by Japanese Side").

(2) **South Sudanese Side**

The South Sudanese side has provided the following inputs to the Project. (see Annex 3-2 "Inputs by the South Sudanese Side" for details.)

1) **Assignment of C/Ps**

The South Sudanese side has assigned the Chair, one Project Director, one Project Manager, and twelve SSUWC members from SSUWC HQ and the Juba Station as C/Ps to the Project (see Annex 3-2-1 "Assignment of C/P Personnel").

2) **Facilities**

The South Sudanese side has provided a room in SSUWC Juba Station for Japanese Experts and training venues for the Project activities.

3) **Operational Expenses by South Sudanese Side**

The South Sudanese side has allocated the total amount of SSP 218,230 for the operational costs of project activities (see Annex 3-2-2 "Operational Expenses by South Sudanese Side").

3-1-2 Achievements of Outputs

(1) Achievements of Output 1

Output 1: Capacity of SSUWC-Juba Station with respect to operation and maintenance of water intake and treatment facilities is improved.
Objectively Verifiable Indicators (OVIs)
1-1. Monthly reports and annual reports in which O&M data is compiled.
1-2. Annual plan on water treatment plant.
1-3. The number of staff who acquired adequate O&M skills for WTP increases from 0 to 11 persons.
1-4. Plant average operating hour per day increases from 17.9 hours (2011 average) to 22 hours/day
1-5. The monthly average ratio that the quality of treated water with respect to turbidity is below 5 NTU increases from 90% to 100%.
1-6. The monthly average ratio that the quality of treated water with respect to residual chlorine falls in the range between 0.7 mg/l and 1.2 mg/l increases from 10% to 80 %.

Output 1 is evaluated to have mostly been achieved judging from the assessment on the implementation of activities as well as the levels of staff's capacity in O&M of water intake and treatment facilities.

The capacity of the purification department's staff in O&M of the water intake and water treatment plant (WTP) has been strengthened by a series of training activities that have been conducted by the JICA Expert Team throughout the Project period as well as the overseas training in Kenya (see Annex 3-1-3 "Training in Japan and the Third Country" and Annex 5 "Training in South Sudan"). According to the results of examination, it was assessed that eleven staff out of the 25 trained staff in the purification department have acquired basic O&M skills for WTP (OVI 1-3).

Under the technical guidance provided by the JICA Expert Team, staff of the purification department have conducted a baseline survey for understanding the status of the intake pumping system and WTP, maintained daily records of O&M, and prepared the O&M plan. In cooperation with C/Ps, the JICA Expert Team prepared O&M manuals and SOP so that staff can conduct proper O&M without an assistance of Experts (see Annex 6 "List of Reports, Manuals, Database and Training Materials"). Staff have mastered proper O&M methodologies including injecting appropriate amounts of chlorine and carrying out back wash. This has led to an improvement in the water quality; the turbidity of treated water constantly stays below 5 NTU in contrast to the monthly average ratio of 79% in 2011 (OVI 1-5) while the ratio of residual chlorine that falls within the target range (0.7 – 1.2 mg/l) improved from an average of 31% in 2011 to 91% in April 2013 (OVI 1-6).

Staff have become able to use a computer and produce monthly reports from the daily monitoring records of the volume of treated water, chlorine consumption, and operation of generators, which is a substantial improvement from their original skill level and understanding about O&M (OVI 1-1). The department staff fully understand the importance of daily monitoring, with the thorough checking and cleaning of facilities having become their routine activities. With the support by the

JICA Expert Team, main C/P developed the annual plan in 2011 and 2012, which included the performance targets for water quality, water production, and pump operation, as well as the statements on outstanding problems, activities for addressing the problems, and required resources (OVI 1-2). Although staff can prepare monthly reports on their own through simple calculation and the filling out of the format developed by the Project, their analytical and planning capacity needs further improvement.

As for the operating hours of WTP (OVI 1-4), it is deemed difficult to achieve 22 hours per day by the end of the Project period under the condition in which SSUWC generates its own power by purchasing fuels for generators from collected water bills. When the baseline data was collected, SSUWC was receiving a relatively stable supply of electric power, which allowed WTP to be in operation for 17.9 hours per day on average. The target plant operating hours (22 hours/day, OVI 1-4) was determined at the time of the baseline survey in 2011 based on the assumption that WTP would receive a stable power supply from the city. Although the direct line from the city power was connected in January 2012, the power supply has been unstable and completely stopped since January 2013. Although the current average plant operating hours is 13.7 hours per day, the operating hours is expected to be increased even without external power supply, as a result of the forthcoming increase in bill collection in 2013 following the adoption of the strategy for efficient billing, new water tariff and improved water quality (see (4) "Achievements of Output 4" for details).

(2) Achievements of Output 2

Output 2: Capacity of SSUWC-Juba Station with respect to operation and maintenance of water transmission and distribution facilities is improved.
Objectively Verifiable Indicators (OVIs)
OVI 2-1. Monthly reports and annual reports in which O&M data is compiled.
OVI 2-2. Annual operation and maintenance plan on O&M of water transmission and distribution facilities.
OVI 2-3. The number of staff who acquired adequate O&M skills for transmission and distribution increases from 0 to 10 persons.
OVI 2-4. Application of a formulated Pump Operation Plan by the Project is started in 2012.

Output 2 is evaluated to have mostly been achieved judging from the achievement levels of its indicators.

Survey activities conducted under the instruction of the JICA Expert Team led to an improvement of the understanding of the distribution department staff on the distribution pipelines, the working condition of transmission and distribution facilities, and the transmission water flow. Based on the survey of the water supply service and existing transmission and distribution facilities, the Pump Operation Plan was developed in 2012 (OVI 2-4); however, treating and distributing water according to the plan was difficult due to the unstable power supply. Since January 2013, the city power has

been completely suspended. Staff of the distribution department then calculated possible operation hours of electric generators, based on which they revised the Pump Operation Plan, as the station is obliged to use only diesel for its operation.

Staff of the distribution department and other departments had never used a computer for data management and report writing before the Project started. The JICA Expert Team provided hands-on training on the use of a computer, and then the staff became able to compile data by themselves, as monthly and annual reports in the computer (OVI 2-1), on the operation of the transmission and distribution facilities including the volume of water flow, cases of water leakages and repairs, and the number of installations or replacements of pipes. Additionally, the JICA Expert Team has provided practical training in proper O&M in water transmission and distribution. GPS/GIS was introduced for identifying water leakages and recording newly installed distribution pipes. Based on the oral and written examination, the JICA Expert Team recognized that 10 out of the 13 trained distribution department staff have acquired adequate O&M skills for the operation of transmission and distribution facilities (OVI 2-3).

With the support by the JICA Expert Team, staff of the department developed the annual operation and maintenance plan in 2011 and 2012 covering performance targets in water flow and repairs of water leakages as well as outstanding problems, activities for addressing the problems, and required resources (OVI 2-2). Due to the lack of budget for purchasing necessary materials for proper O&M, the number of repair works against the cases of water leakages has not been sufficient. It is recommended that continuous efforts be made to generate more revenues to secure the proper maintenance of the distribution network.

(3) Achievements of Output 3

Output 3: Capacity of water quality management of SSUWC-Juba Station is improved.
Objectively Verifiable Indicators (OVIs) OVI 3-3. Water quality management report (monthly and annual) in which water quality monitoring data is compiled. OVI 3-4. The number of staff who acquired adequate water quality test skills increases from 0 persons to 2 persons.

Output 3 is evaluated to have been achieved judging from the achievement levels of its indicators. While all training under Output 3 has been conducted as planned, a longer time frame than originally expected was needed for the lab staff to comprehend basic ideas of water quality tests including the concept of unit and simple arithmetic. Continuous On-the-Job Training (OJT) by the JICA Expert Team and repeated experiments have enhanced the water quality test skills of the two lab staff (OVI 3-2).

The water testing lab staff collect samples daily from WTP, weekly from pumping stations and elevated tanks, and monthly from water tap stands and tanker filling stations in Juba City, and

conduct water test on turbidity, residual chlorine, pH, conductivity, Total Dissolved Solid (TDS) and color. After training in basic computer literacy and the preparation of the data format, these staff became able to develop monthly reports compiling the results of daily water tests.

Given the current limited capacity of the water test laboratory (i.e. the staff and facilities), the training of the existing staff in testing more parameters including microbiology is difficult. Equipping the water test laboratory with qualified staff and proper facilities is essential in order to cater to the need for water quality tests.

(4) Achievements of Output 4

Output 4: Understanding of financial conditions of SSUWC-Juba Station is enhanced.	
Objectively Verifiable Indicators (OVIs)	
OVI 4-1	Revenue collection reports are prepared monthly.
OVI 4-2	Recommendations on revenue collection improvement are made.
OVI 4-3	Management method of public water tap stands is established.

Judging from the achievement levels of its indicators, Output 4 is evaluated to have mostly been achieved. In cooperation with the staff of the financial department, the JICA Expert Team conducted a study on the actual situation of the revenue collection in the Juba Station. Based on the analysis of the cost structure, recommendations on the improvement of revenue collection and water tariff have been put forth in the budget plan and the annual plan of the Juba Station (OVI 4-2). The recommendations have been reflected in the increase of the water bills. In view of the forthcoming financial independence of the Juba Station, the JICA Expert Team provided training in the concept of tariff setting and cost recovery for the existing operation of the Juba Station.[2]

In consultation with the staff of the financial department, the JICA Expert Team developed a customer ledger database to be used for compiling customers' information and issuing bills, which contributed to an achievement of efficiency in bill collection. Staff of the financial department participated in the training in Kenya on the metered system for house connection and customer services. In addition to the training for the management of customer ledger, the JICA Expert Team has also provided basic computer training for the staff. As a result of a series of these training activities, the staff have acquired skills to prepare monthly reports through extracting data from the database (OVI 4-1); the routine of compiling information to develop reports has been well established. However, there are still four major challenges that could hinder effective revenue collection: (1) the insufficient number of staff who distribute bills; (2) a large number of unidentified consumers using SSUWC's water for free; (3) the lack of a map indicating the location of customers; and (4) inadequate budget for purchasing water meters and other materials required for house connections.

[2] SSUWC developed the interim tariff to maintain the operation and maintenance of existing facilities after the training.

Through the activities of collecting the baseline information, staff of the SSUWC Juba Station have gained better understanding on the station's financial situation, status of installed water meters, and level of customer satisfaction. Following the pilot operation and studies on the management models for public taps and tanker filling stations, the JICA Expert Team recommended that the public taps and tanker filling stations be managed by individual operators (OVI 4-3). In preparation for increased public taps and tanker filling stations, the Project has developed a draft contract and data log sheet for site operators. When the JICA's Grant Aid project, "The Project for the Improvement of Water Supply System of Juba in South Sudan" (2012-2015), is completed, additional 120 public taps and eight tanker filling stations will be in operation in 2015.[3] Since the Juba Station will be required to manage a large number of site operators and monitor their activities, the financial staff's capacity in contract management needs to be strengthened.

(5) Achievements of Output 5

Output 5: Capacity of SSUWC-HQ to support SSUWC-Juba Station is enhanced.
Objectively Verifiable Indicators (OVIs)
5-1. SSUWC HQ examines the monthly reports submitted by SSUWC Juba Station every other month.
5-2. The number of annual reports and plans that SSUWC HQ examined becomes 2 each.
5-3. The existing water supply facilities and services are inputted into the established database.

Output 5 is evaluated to have been achieved judging from the achievement levels of its indicators.

With the guidance and instruction by the JICA Expert Team, SSUWC HQ has been carrying out the evaluation of monthly reports submitted by the Juba Station in accordance with "The Roles of SSUWC Headquarters and Reporting and Planning System". SSUWC HQ has been holding a review meeting with the management staff of the Juba Station, examining monthly reports submitted by the station, and providing feedback to the station every month (OVI 5-1). SSUWC HQ also reviewed and assessed annual reports and the up-coming year's plan of the Juba Station in 2011 and 2012 (OVI 5-2). While the structure of providing feedback and guidance to the station has been established, continuous efforts to support the Juba Station as well as other area stations are required for strengthening the newly established organizational structure.

The Project conducted a study on the Wau and Malakal stations to collect information on their facilities and status of service delivery. Along with the information on the Juba Station, the data on the Wau and Malakal stations was compiled in a report (OVI 5-3).[4] The study presented the current situation of each of the three area stations; however, it is still unclear as to how SSUWC HQ is going to incorporate and reflect the compiled information in its planning and management.

[3] The Juba Station currently manages four out of six public taps and one out of four tanker filling stations. Two public water tap stands and three tanker filling stations are out of order due to insufficient water flow.
[4] The Project did not conduct survey in other area stations due to safety concerns.

3-1-3 Prospect for Achieving the Project Purpose

Project Purpose: The management capacity of SSUWC-Juba Station is enhanced through capacity development on operation and maintenance of water supply facilities.
Objectively Verifiable Indicator (OVI) 1. 80% of 25 essential performance indicators set in the annual plan which are measurable at the SSUWC Juba Station is improved compared to the 2011 average.

Table 3. Progress in 25 Essential Performance Indicators

		Indicators	Unit	Monthly average in 2011	April 2013
Production					
1	P1	Average daily production volume (estimate)	m3/day	5,208	3,711
2	P2	Average plant operating hour per day (estimate)	hours/day	17.9	14.1
3	P3	Average daily clear water pumping station operating hours	hours/day	28.2	27.2
4	P4	Gap between design capacity and actual production	m3/day	1,992	3,489
5	P5	Operating ratio (actual average production/design capacity)	%	72	52
6	P6	Operating ratio (actual average operation hours/24 hours)	%	74	58
Distribution					
7	D1	Average daily pump operation hours of Hospital PS	hours/day	5.8	3.3
8	D2	Average daily pump operation hours of Konyokonyo PS	hours/day	1.5	0.4
9	D3	Total transmission and distribution flow from WTP	m3/day	4,928	2,232
10	D4	Percentage of No. of leakage repaired in No. of leakage reported	%	55	100
11	D5	The number of days that data on pipe maintenance is recorded per month	days/month	0	30
Water Quality					
Daily Sampling (purification plant)					
12	W1	Compliance ratio of turbidity	%	79	100
13	W2	Compliance ratio of residual chlorine	%	31	91
Weekly sampling (tank in the city)					
14	W3	Ratio of days that sampling was conducted to required total weekly sampling days	%	43	100
15	W4	Ratio of actual samples to the total number of required weekly samples	%	19	100
16	W5	Compliance ratio of turbidity	%	77	83
17	W6	Compliance ratio of residual chlorine	%	13	100
Monthly sampling (tap in the city)					
18	W7	Ratio of days that sampling was conducted to required total monthly sampling day	%	63	83
19	W8	Ratio of actual samples to the total number of required monthly sample	%	42	83

		Indicators	Unit	Monthly average in 2011	April 2013
20	W9	Compliance ratio of turbidity	%	76	100
21	W10	Compliance ratio of residual chlorine	%	14	80
Sales					
20	S1	Number of bills delivered	num	545	476
21	S2	Amount of bills delivered	SSP/month	249,348	330,842
24	S3	Bills issued/ a total number of connection	%	16	13
25	S4	Collected amount (SSP)/ a total amount billed	%	21	50

The prospect for achieving the Project Purpose by the end of the project period is evaluated as promising judging from the achievement levels of its indicators. Except for the Performance Indicators (PIs) that are determined by the situations of power supply and accessibility to fuel (i.e. P1-P6, D1-D3 in Table 3), all the PIs have improved from the values in 2011.

As discussed in 3-1-2 "Achievements of Outputs," the management capacity of the Juba Station has considerably improved in each department though OJT by the JICA Expert Team and overseas training in Kenya and Japan. Although staff's limited skills of English, computer and arithmetic could be hindering factors, the JICA Expert Team adopted appropriate approaches for capacity development and succeeded in raising the skill level of the Juba Station's staff. The capacity development approaches including hands-on training, teamwork and problem solving through discussions with C/Ps have been highly appreciated by C/Ps and proved to be a quite effective method for capacity development. The JICA Expert Team used figures and pictures in the posters and manuals illustrating operation procedures in order to make these materials simple and understandable for all the staff including the illiterate and the uneducated. The JICA Expert Team first trained managers and core staff to be department-level trainers so that they could translate the Experts' lectures and transfer the proper O&M methodologies to the staff whose English proficiency and basic arithmetic skills are limited.

As a result of the above-mentioned OJT, proper O&M procedures are currently applied to WTP, pumping stations and distribution network in which staff regularly monitor the water supply facilities and properly keep records of the water volume and dosage of chlorine and alum. Daily O&M records are compiled in electronic data sheets developed by the Project. Some of the staff who had never used a computer before the Project have become able to compile the data, conduct simple analysis and prepare monthly reports. Staff's understanding of the locations of distribution pipes through mapping and their practices of keeping records of the status of water leakages have enabled more organized and efficient repair work of water leakages (D4 in Table 3). Water quality tests are now been conducted daily on WTP, weekly on pumping stations and water tanks, and monthly on

public water taps and tanker filling stations (W3-4, W7-8 in Table 3). The quality of water from the station as well as sampling points in the city also fulfills the standards (target ratios) for turbidity and residual chlorine (W1-2, W5-6, W9-10 in Table 3). Using the customer ledger database developed by the Project, the financial department has become able to make sure that high-volume water users are billed in order to increase revenue. By placing a priority on the billing to high-volume water users, the amount of delivered bills increased from a monthly average of SSP 249,348 in 2011 to SSP 330,842 in April 2013.[5]

As for the indicators that are dependent on the availability of power supply and accessibility to fuel, which are external factors to the Project, staff of each department calculate possible operation hours for WTP and pump stations based on the income amount from water bill collection, revise the operation plans, and operate the facilities accordingly. While achieving target operation hours defined in the PDM by the end of the Project period is deemed difficult without stable power supply, staff have become able to operate water supply facilities according to the plans using acquired knowledge and skills. The daily plant operating hours, which is currently 13.7 hours, is expected to increase since the income from water bills will increase as a result of the efficient billing system (i.e. data management using the digital customer ledger, strategy of and billing high-volume users), revised water tariff, and improved quality of water.

3-1-4 Prospect for Achieving the Overall Goals

Overall Goals: **1. The quality of the water supply service extended by SSUWC-Juba is improved.** **2. The management capacity of SSUWC HQ is improved.**
Objectively Verifiable Indicators (OVIs) 1. The customer satisfaction on water supply service of SSUWC-Juba Station is enhanced. 2. All essential performance indicators are further improved from the final date of the Project. 3. All reports and plans submitted from area stations are assessed and guidance is given back to them.

The prospect for achieving the Overall Goals within three to five years after the project completion is promising judging from the achievement levels of its indicators; however, the limited power supply is likely to hinder the achievement of the Overall Goals.

According to the Social Condition Survey for Water Supply Service conducted by the Project, the customer satisfaction rate on SSUWC's water supply service (OVI 1) has increased from 22.4% in 2010 to 36.4% in 2013. Staff of the Juba Station received comments from customers that water

[5] The number of delivered bills decreased from a monthly average of 545 in 2011 to 476 in April 2013. This was because some customers rejected bills on the ground of failure of water provision caused by reduced operating hours and subsequent decrease of water production.

quality had improved. The elements of current dissatisfaction of SSUWC's water supply service include irregular water supply, short service hours, insufficient water supply and low water pressure.

As discussed in 3-1-3 "Prospect for Achieving the Project Purpose," all 25 essential performance indicators, except those linked with the power supply grid (i.e. P1-P6, D1-D3 in Table 3), have greatly improved since the Project started. The essential PIs are expected to be further improved after the Project period should proper O&M be continuously carried out and bill collection be increased (OVI 2).

Following the evaluation checklist developed by the Project, SSUWC HQ reviews and evaluates monthly reports and annual plans submitted by the Juba Station. Since SSUWC HQ has carried out the reviewing process multiple times, SSUWC HQ is already capable to assess reports and plans from other area stations (OVI 3) as well. However, without proper guidance and attention, area stations other than the Juba Station are unable to prepare and submit reports to SSUWC HQ. There is a need for discussions in SSUWC HQ in relation to how to extend support to other area stations and promote coordination among donors that support respective stations.

SSUWC HQ is currently in the process of studying and understanding the status of O&M in each of the area stations. Since reviewing reports of and providing guidance to area stations have not been carried out by SSUWC HQ during the Project period, whether SSUWC HQ can provide, based on detailed analysis, appropriate guidance to each respective area station is yet to be known.

3-2. Implementation Process of the Project

3-2-1. Project Management, Monitoring and Ownership

The Project has been conducted with an effective and open communication between the JICA Expert Team, SSUWC Juba Station and HQ staff members. Joint Coordination Committee meetings were held annually to monitor the overall progress of the Project. C/Ps and the JICA Expert Team have held weekly meetings to share and discuss the results of completed activities, outstanding issues and the countermeasures that should be taken by the SSUWC Juba Station and HQ, through which C/Ps' strong ownership of and commitment to supplying safe water have been developed. Given the Experts' short-term assignments, the JICA Expert Team arranged their fieldwork schedule so that their absence from the SSUWC Juba Station was minimized while encouraging C/Ps to attend weekly meetings. As a result, organizing weekly meetings among all the departments of the Juba Station became a routine activity. Through these regular meetings that have nurtured strong cooperation between C/Ps and the JICA Expert Team, the Project has responded flexibly to the ever-changing political and fiscal situations and made sure that the planned activities are conducted smoothly.

3-2-2. Methods of Maintaining and Enhancing Motivation

The JICA Expert Team made various efforts for maintaining and enhancing motivation of the staff of the Juba Station, especially those who have limited English proficiency and computer and basic arithmetic skills. The Mid-Term Review pointed out that the inability to comprehend training sessions was one of the factors for C/Ps' low participation in training sessions. In order to promote understanding of training contents among non-English speaking staff, the JICA Expert Team gave examples and cases as to what actions to be taken in specific cases of situation, and provided visual aids including tables and simple figures demonstrating proper O&M methodologies of facilities. The Project assistants and SSUWC's English speaking staff helped the JICA Expert Team by interpreting the training sessions for the staff whose English comprehension is limited. After discussions with C/Ps followed by multiple revisions, simple and user-friendly Standard Operational Procedures (SOPs) and manuals were developed. Working together with the JICA Expert Team who has a high level of diligence and patience, C/Ps learned O&M techniques as well as time management, problem solving and commitment for providing safe water. In order to raise C/Ps' motivation, the JICA Expert Team occasionally provided incentives for C/Ps, including an award to the staff who scored high on a comprehension test after training.

3-3. Responses to the Recommendations of the Mid-Term Review

3-3-1. Recommendation 1: Strengthen public relations

Following the recommendation of the Mid-Term Review, the Project conducted several public relations (PR) activities. The Juba Station invited 60 students from local elementary and secondary schools for a study tour of WTP. Staff of the Juba station presented the function of water supply facilities using posters to the school children. The process of preparing for presentation raised the motivation and ownership of staff. The local TV station broadcasted the study tour at the Juba station. A song called "Water is Life" was written by a local musician for raising awareness of water consumers in preserving water and played for the school children. The Project also organized a picture contest, which helped to promote a better understanding about the importance of preserving water. Continuous efforts in raising awareness of consumers on water supply services are encouraged for promoting better understanding about the function of SSUWC and improving bill collection.

3-3-2. Recommendation 2: Proactive contribution in the activities from both sides

The Mid-Term Review called for C/Ps' active participation in meetings and training as well as the JICA Expert Team's additional actions to fill the capacity gap. The level of C/Ps' participation in weekly meetings and training sessions has improved since the Mid-Term Review. Staff of each department proactively participated in weekly meetings with the issues for discussion typed up and

printed out in advance for distribution by themselves. The JICA Expert Team offered additional computer classes to teach basic functions of computer and English training to improve staff's English skills. Training course was interpreted by English-speaking staff and Project assistants. Through these efforts and contribution from both sides, capacity development has been promoted; a significant improvement in the capacity of trained staff was confirmed in the capacity assessment.

3-3-3. Recommendation 3: Input additional equipment necessary to enhance the Project effectiveness

Following the recommendation of the Mid-Term Review, additional equipment has been provided in a timely manner to produce expected Outputs. New chlorine injectors have enabled staff to measure appropriate amounts of chlorine. Flow meters for measuring raw water have been replaced with electromagnetic ones to avoid frequent malfunction from clogging with algae. A total of eight motor cycles have been provided to make the activities for bill delivery, water sampling, meter checking and monitoring of distribution pipes more efficient.

3-3-4. Recommendation 4: Secure necessary budget for O&M activities

Securing budget for continuous O&M activities seems to be the most difficult element. Neither the expenditures for reagent and the domestic travel for staff of area stations outside Juba City (as pointed out by the recommendation of the Mid-Term Review), nor the in-kind provision of chemicals and fuel for generators have been made under the fiscal austerity. In exchange, the Juba Station has been allowed to retain the full amount of the revenue from bill collection and use it for O&M. In order to respond to the changed financial regime, staff have revised the Pump Operation Plan so that operation hours of facilities match the level of the collected water bills. With a view to achieving the goal of 24 hour pump operation by January 2014, the Juba Station is in the midst of taking a number of measures in increasing bill collection, including charging bills according to the revised water tariff, adopting an efficient billing strategy, and installing water meters.

3-3-5. Recommendation 5: Strengthen the organization by recruiting necessary staff

Despite the recommendation made by the Mid-Term Review, some of the key staff in the respective departments and HQ have not been appointed. Although existing staff in the laboratory have been improving their skills in sampling tests, a larger number of eligible staff are urgently needed. Recruiting staff in the middle management positions in SSUWC HQ is recommended for better planning and management of SSUWC HQ and all the area stations.

4. Result of the Evaluation

4-1. Evaluation by the Five Criteria

4-1-1 Relevance: High

The Relevance of the Project is evaluated as high since the improvement of water supply services through the capacity enhancement of SSUWC is in line with the needs of South Sudanese people, the Government of South Sudan's development policy, and the Japanese Government's aid policy to South Sudan. The project approach (SBI/CBI) is also deemed appropriate.

(1) Relevance with the Needs of South Sudanese people

The Project is in line with the needs of the end beneficiaries since urban water supply had not been adequately provided in Juba due to the absolute lack of purified water and inappropriate O&M of the water distribution system. While the Juba Station with the water treatment capacity of 7,200 m^3 per day supplies treated water in the City, its coverage is mostly limited to businesses and factories in the city.[6] For drinking water, people rely on untreated river water distributed by water tankers or water from shallow wells with a high level of salt contamination. With the rapid increase in population of Juba, the Government was in need of urgently providing adequate and reliable water to people living in the city.

(2) Relevance with the Development Policy of the South Sudanese Government

Given the above-mentioned situation, the Republic of South Sudan (ROSS) sets the provision of urban water and sanitation as one of the priority areas for the nation's socioeconomic development in its "Water Policy" (2007). In the Policy, the Government aims to promote efficient, equitable and sustainable development and use of available water resources, and effective delivery of water and sanitation services. In particular, ROSS is committed to ensuring rapidly growing urban populations benefit from access to safe, affordable and reliable water supply and sanitation services. The specific objectives in the Policy include: to promote technical and management training of staff working at all levels in urban water and sanitation services; and to improve the financial sustainability of urban water systems through the introduction of efficient management practices.

(3) Relevance with the Japanese Aid Policy to South Sudan

Japan's assistance policy for South Sudan sets "Assistance for Basic Human Needs (BHN)" as one of the three priority areas for its development assistance towards South Sudan, which constitutes part of the Japan's assistance policy to Sudan in the consolidation of peace adopted at the first Sudan consortium in 2005 in Oslo. As part of the assistance for BHN, the aid policy for South Sudan aims

[6] The service coverage is only 8% of the city population.

at the enhancement of public service delivery including the improvement of water supply systems. Japan is committed to providing safe water to 6.5 million people in Africa, which was expressed at the Fourth Tokyo International Conference on Africa Development (TICAD IV) in 2008.

(4) Appropriateness of the Project Approach

The Project approach for improving the management capacity of the SSUWC Juba Station and HQ in South Sudan is deemed appropriate. The Project conducted a series of OJT activities primarily targeting department managers and technical staff of the Juba Station. The JICA Expert Team carried out the daily O&M activities with the department managers and technical staff and developed their capacity in record keeping, maintaining water supply facilities, communicating among departments and preparing reports. The capacity development approach through hands-on instruction and practical training proved to be appropriate since the department managers and technical staff of the Juba Station could immediately apply knowledge and skills to their daily tasks.

4-1-2 Effectiveness: Relatively High

The Effectiveness of the Project is assessed as relatively high because the prospect of the Project Purpose being achieved by the end of the project period is deemed promising and there is a clear linkage between the achievement of the Project Purpose and the successful production of Outputs.

(1) Prospect for Achieving the Project Purpose

As discussed in 3-1-3 "Prospect for Achieving the Project Purpose," the prospect for the management capacity of the Juba Station to be enhanced by the end of the Project period is evaluated as promising. Due to the unstable power supply since 2012, the Project faced difficulty in reaching the target operation hours of WTP and pumping stations. As a result, 56% (14 PIs) of the PIs marked improvement in April 2013, which is lower than the target rate of 80%. Under the current power supply situation, achieving the target operation hours and water production volume deemed difficult. On the other hand, staff acquired skills and knowledge to calculate possible operation hours of WTP and pump stations to match the expected revenue from bill collection and to operate the water supply facilities in accordance with the developed operation plans. In view of becoming a self-sustained organization and achieving 24 hour operation by January 2014, SSUWC intends to continue carrying out proper O&M activities and take appropriate measures (i.e. the efficient billing system, revised water tariff, and meter installation for house connections) to increase its revenue. Once the income increases due to improved bill collection, staff will be able to manage WTP and pump stations for longer hours and produce a larger amount of water.

(2) Causality between the Project Purpose and Outputs

The five Outputs cover all the major components (O&M of water intake and treatment facilities

[Output 1], O&M of water transmission and distribution facilities [Output 2], water quality management [Output 3], financial management [Output 4] and SSUWC HQ's support system to the Juba Station [Output 5]) that are necessary to enhance the SSUWC's management capacity. Therefore, the successful production of the five Outputs is directly linked to the achievement of the Project Purpose. As discussed in 3-1-2 "Achievement of the Outputs", most of the expected Outputs have been either achieved or mostly achieved. The capacity in the operation and management of the SSUWC Juba Station as well as in the support system by SSUWC HQ is assessed to have been improved.

4-1-3 Efficiency: Moderate

The Efficiency of the Project is evaluated as moderate since most Project activities have been conducted as planned to produce the intended Outputs although there have been some constraints in the production of Outputs caused by such issues as the decrease in the government budget and the insufficient power supply.

(1) Production of Outputs and Causality between Inputs/Activities and Outputs

In consideration of the drastic changes in external conditions (i.e. fiscal austerity, interruption of the power supply, and transfer of personnel) that have significantly affected the Project, the Project has taken appropriate measures and practical approaches, including the revision of the Pump Operation Plan, the provision of incentives (e.g. award) and active discussions among C/Ps and the JICA Expert Team at weekly meetings, in order to facilitate the successful production of intended Outputs.

Most inputs that are necessary for the implementation of activities have been allocated in a timely manner and used effectively to contribute to Output production. The JICA Expert Team adjusted the timing of its members' assignments to minimize the absence of the Team from the SSUWC Juba Station throughout the Project period, which helped timely implementation of Project activities. The overseas training in Japan and Kenya was organized multiple times in a wide variety of fields including customer meter management, human resource management, O&M of a water distribution network and of an electro-mechanical system. The opportunity for overseas training was extended to management and technical staff of HQ, MWRI, the Juba, Wau and Malakal stations, which has contributed to the nurturing of motivation and ownership to the Project of the staff from the management level to the field level. Following the recommendation of the Mid-Term Review (Recommendation No. 3), additional equipment including chlorine injectors, electromagnetic flow meter and motor cycles has been procured, which improved the efficiency of the Juba Station's operation.

While the South Sudanese staff's low attendance in the training and limited English skills reduced the efficiency of the Project at the initial stage of the Project, the JICA Expert Team patiently worked with staff, offered training in the same contents multiple times, and provided classes on basic English and computer literacy. As a result, the tangible improvements in daily practices have been observed including daily data collection and proper O&M procedures.

The Project has effectively cooperated with GIZ and USAID through information sharing. Donors including GIZ and USAID met monthly at the Urban Water Working Group meetings organized by SSUWC HQ. Project officers of GIZ and USAID were invited to seminars in which the Project's progress and planned activities were presented. The study report on the existing water supply facilities and services of the Juba and Malakal stations was shared with GIZ that is in the process of developing a comprehensive database on SSUWC area stations. USAID is currently developing a GIS map compiling customers' information in the Juba Station that is built on the GIS map of the distribution network developed by the Project.

(2) Important Assumptions of Outputs

Two issues that are related to the Outputs' Important Assumptions (risks of the decrease of the government budget and the insufficient power supply) have constrained output production. Due to the budget constraints, the expenses for reagent for water quality tests and chemicals have not been provided by the South Sudan side. The lack of provision of travel expenses for area stations hindered the implementation of the Project activity 5-5 "Assistance to SSUWC HQ in holding monthly meeting with stations and MWRI". While the monthly meetings have been organized by SSUWC HQ, no staff from the area stations other than Juba has participated in the meetings.

As discussed in 3-1-3 "Prospect for Achieving the Project Purpose," power supply has been suspended since January 2013. Staff has revised the operation plan and adjusted the operation hours of WTP and pump stations. While the water production volume has inevitably decreased, staff have been able to operate the facilities according to the planned schedule.

4-1-4 Impact: Good potentials to generate a large scale of impacts

The prospect for achieving the Overall Goals within three to five years after the project completion is evaluated as promising. If all the staff of SSUWC HQ and the Juba Station fulfill their commitment and carry on with proper O&M activities and financial management, the Project will generate a large scale of impacts.

(1) Prospect of Achieving the Overall Goals

The Overall Goals of the Project are (1) the improvement in the quality of the water supply service of the Juba Station and (2) the improvement of the management capacity of SSUWC HQ. As

discussed in 3-1-3 "Prospect for Achieving the Overall Goals", the prospect for achieving the Overall Goals within three to five years after the project completion is assessed as promising, judging from the achievement level of three OVIs: (1) the customer satisfaction rate on the water supply service; (2) essential PIs, and (3) SSUWC HQ's capacity in assessing area stations' reports and plans. Despite the decrease in the water production volume, the customer satisfaction has improved due to the improvement in water quality. Given the increasing trend of income from water bills in 2013, the operation hours of water supply facilities is likely to increase, which will lead to a further improvement in the customer satisfaction.[7] The entire system of regular monitoring of water supply facilities, data management, communication through weekly meetings, and monthly reporting to and assessment by SSUWC HQ has become routine activities of the Juba Station. It is important that staff of SSUWC and the Juba Station continuously implement the current O&M activities.

(2) Promoting and Inhibiting Factors for Achieving the Overall Goals

One of the major promoting factors to the achievement of the Overall Goals is the synergetic effects produced by the Project's cooperation with development partners (USAID, GIZ, MDTF, etc.) in improving the quality of urban water services in Juba City. During the Project, in selecting appropriate management models for tap stands, the JICA Expert Team referred to GIZ's operational procedure of public tap stands. GIZ requested the JICA Expert Team to share the database on the area stations developed by the Project so that GIZ could utilize the Project's database for the development of an asset management database. Under the Sustainable Water and Sanitation in Africa (SUWASA) program, USAID has been assisting the Wau and Maridi Stations in becoming self-sustained organizations. As part of the program, USAID developed a GIS map indicating the locations of customers' residences, payment information and the status of the meter installation of the Wau Station. USAID is planning to develop the similar type of a customer information map for the Juba Station under its Small Infrastructure Project (SIP), building on the GIS water distribution network database created by the Project. Effective cooperation with development partners will bring about synergy and promote the achievement of the Overall Goals.

As discussed in 3-1-2 "Achievements of Outputs", the power shortage has negatively affected the quality of the water supply service and will be a hindering factor for achieving the Overall Goals.

4-1-5 Sustainability: Moderate

The Sustainability of the Project is evaluated as moderate. On one hand the Project has developed human resources who have basic technical foundations to properly conduct O&M of water supply facilities, water quality tests and financial management, and built an internal mechanism for

[7] The Juba Station's income from bill collection has steadily increased from SSP 102,272 in January 2013 to SSP 166,076 in April 2013.

information sharing and collaboration among different departments. On the other hand, there are serious concerns in regards to the securing of the expenses for fuel and O&M and need for organizational strengthening of SSUWC HQ and the Juba Station.

(1) Institutional Aspects

Institutional sustainability is assessed to be ensured by the ROSS' overall strategies for urban water sector development. In 2011, the ROSS adopted "Water, Sanitation and Hygiene (WASH) Sector Strategic Framework" as a guideline to realize the National Water Policy (2007). The WASH Sector Strategic Framework provides for the urban water supply strategy that is aimed to "ensure efficient rehabilitation, expansion, development and management of UWS services on a sustainable, equitable and cost recovery basis". The Project is also supported by the "South Sudan Development Plan (2011-2013)," which places improved water and sanitation infrastructure as one of the top five priority programs under its Economic Pillar.

(2) Organizational Aspects

From the organizational perspective, roles and responsibilities of SSUWC HQ and each department of the Juba Station have been clearly defined and well understood among all parties. As a result of needs identified through Project activities, the Juba Station established the department of planning and projects and is planning to set up the customer service department. In order to function properly and improve the planning and customer services of the Juba Station, these new departments further require organizational strengthening and capacity development. Weekly meetings are being held involving all the departments of the Juba Station even during the absence of the JICA Expert Team, and are expected to continuously play an important role for sharing information on the progress of activities and discussing outstanding issues and upcoming plans.

Staffing issues pose challenges against organizational sustainability. The Mid-Term Review pointed out the need to increase qualified staff in SSUWC HQ and the Juba Station (Recommendation No. 5). At the time of the Terminal Evaluation, neither the management positions (i.e. a technical director and commercial director) in SSUWC HQ nor staff of the laboratory were recruited. In order to increase revenue, a larger number of staff is required for bill collection in addition to the existing four staff members. More engineers with a university degree are also necessary since the need for technical staff in water production and distribution is rising and the Juba Station currently has only two engineers out of four posts. It is reported that the request for appointing new staff both in SSUWC HQ and the Juba Station has been submitted to MFEP from the Managing Director of the SSUWC HQ.

(3) Technical Aspects

The Project has built a sound technical foundation for continuous O&M, proper record keeping and regular information sharing. Staff of the Juba Station have acquired basic skills and knowledge to carry out O&M activities in accordance with the annual plan. In particular, core staff of the purification, distribution and financial departments have started training their staff in respective assignments using skills and knowledge acquired from the Project. The quality of supplied water has improved as a result of injecting an appropriate amount of chlorine and flocculent and regular water tests. Staff's technical capacity in O&M of water supply facilities has reached a minimal level to properly operate and maintain the current facilities; however, continuously carrying out the newly introduced O&M procedures among all the staff in the Juba Station is necessary to raise the skill level of the station's staff for the extended pump operation and increased water production that are expected until the end of the Project period.

(4) Financial Aspects

The Project has contributed to the establishing of a base for achieving SSUWC's financial independence although it was not the main goal of the Project. Since the Government has suspended the in-kind provision of fuel for generators, the Juba Station has been purchasing the fuel using the revenue from bill collection and operating the water supply facilities according to its revised plan. The monthly revenue steadily increased from SSP 102,272 in January 2013 to SSP 166,076 in April 2013 as a result of the efficient billing system introduced by the Project and the revised water tariff applied in February 2013. Customers' increased willingness to pay due to improved water quality also seems to have contributed to the increase in the revenue. According to the revenue forecast created by the Project, the Juba Station will collect monthly revenues of SSP 202,000 and achieve 24 hours of operation by January 2014. While the quality and quantity of supplied water is expected to enhance, the Juba Station is examining the feasibility of new payment methods including setting up payment kiosks throughout the city and accepting payment through a direct deposit into the Juba Station's account in order to make payment easy for consumers who are unable to visit the SSUWC office. As long as the Juba Station continues ensuring the billing to large-volume water users and applying the revised water tariff, the monthly revenue will increase steadily. By investing collected bills in fuel for generators, the quality of water supply service will improve due to the extended operation hours of WTP and pump stations and the increased water production. Although it is deemed difficult to achieve the target plant operation hours per day (i.e. 17.9 hours, P2 in Table 3 of page 14) by the end of the Project period, the Juba Station is committed to increase bill collection through the introduction of the efficient billing system and the new water tariff in order to achieve the operation of 24 hours by January 2014.

4-2. Conclusion

The Project has made a significant progress in developing the management capacity for the SSUWC Juba Station and HQ. Judging from the achievement level of each expected Output, the Project Purpose is expected to be achieved by the end of the Project period.

The Project has high relevance assessed from the ROSS's development policies, Japanese Government's aid policies, and the needs of the beneficiaries. The effectiveness of the Project is evaluated as relatively high because the Project has succeeded in building the basic O&M and managing capacity of the Juba Station; however, raising the skill level of all the staff is indispensable for further achievement of operational efficiency of the water supply facilities. The efficiency of the Project is evaluated as moderate since most inputs have been successfully converted to the expected Outputs in spite of the staff's low participation in the Project activities in the initial stage of the Project. The Project has good potential to generate a large scale of impacts if staff continues their effort in conducting proper O&M and financial management of the Juba Station. In order to enhance the sustainability of the Project, more efforts are required for appointing eligible staff in the laboratory, SSUWC HQ, and the financial department, and increasing revenue to cover O&M costs.

Although laying the foundation for proper O&M and management of a water corporation in a post-conflict country is an enormous challenge, the Project has successfully brought about significant achievement in staff's operation and management capacity in the SSUWC Juba Station and HQ. In order to ensure the achievement of the Project Purpose by the end of the Project and further improve the sustainability and impact of the Project, the Joint Evaluation Team makes the following recommendations.

5. Recommendations and Lessons Learned

5-1. Recommendations

5-1-1. Ensuring the implementation of assigned tasks in accordance with the established procedures and data management system in each department

Before the Project implementation, there were no structured O&M procedures, digital record-keeping and data management system, or regular water quality analysis, all of which have been established by the Project. The Project also succeeded in assisting core staff of the Juba Station in acquiring proper O&M skills in the purification and distribution departments, data management skills in the financial department and regular water quality test in the laboratory. In order to further enhance the management capacity of the Juba Station for the expected increase of operation hours and water production, it is recommended that staff in the SSUWC Juba Station thoroughly conduct

the newly-established O&M, water tests, and billing procedures in accordance with the O&M manual and data management system developed by the Project.

5-1-2. Planning a structured internal training system

During the course of Project activities, core staff and C/Ps voluntarily started providing informal training for staff in each department. Peer training is effective since trainers can effectively respond to the trainees' learning needs using the already-established rapport and the shared language. Since raising staff's overall technical capacity is still necessary for further enhancing the skill level of O&M and bill-collection activities, it is recommended that the SSUWC HQ and the Juba Station start the planning of a structured internal training system.

5-1-3. Extending support to area stations

The Project laid out the SSUWC HQ's procedure in providing support to area stations through evaluating the Juba Station's monthly reports and upcoming plans and giving feedback in a systematic way. Although SSUWC HQ is capable of assessing reports submitted by the Juba Station, other area stations need proper guidance and attention to prepare and submit reports to SSUWC HQ. It is recommended that SSUWC HQ develop effective strategies to extend support to area stations outside Juba City; for example, organizing an area stations meeting periodically as a platform of sharing good practices and lessons learned or mandating all the area stations to submit reports regularly in the format developed by the Project. These measures will promote better communication and information sharing among SSUWC HQ and area stations.

5-1-4. Increasing bill collection

Although it is not a part of the Outputs or target objectives of the Project, continuous efforts in increasing bill collection are recommended in order to enhance SSUWC's financial sustainability under the ROSS's uncertain fiscal prospect. While the financial department of the Juba Station is carrying out the billing activities more efficiently than before through the digital customer ledger, a larger number of staff who deliver the bills would increase the income from water bills. The financial department has made efforts to introduce the methods that make customers' payments easier (e.g. payment through a direct deposit into the Juba Station's bank account, payment kiosks throughout the city). Installing meters for house connections and businesses will increase bill collection. In order to facilitate the process of installing meters, the cost of meter installation should be recommended during the Project period.[8] In addition, the Japan's Grant Aid project[9] will construct 120 public taps and 8 tanker filling stations by 2015 which is expected to contribute to an increase in bill collection. In order to properly manage and monitor the activities of a large number of site operators, the Juba Station is recommended to review the "Evaluation of the Management

[8] The Juba Station has 2,000 water meters granted by the Multi Donor Trust Fund (MDTF).
[9] The Project for the Improvement of Water Supply System of Juba in South Sudan (2012-2015)

Model for the Public Tap Stands and Tanker Filling Points", analyze lessons learned, and start planning the staffing structure of managing the public taps and tanker filling stations. The Juba Station's capacity in contract management also needs to be strengthened.

5-1-5. Recruiting qualified staff

Recruiting qualified staff in vacant positions is indispensable in enhancing the organizational sustainability. As recommended in the Mid-Term Review, directors' positions (i.e. technical director and commercial director) in SSUWC HQ and staff of the laboratory need to be filled as soon as possible. In addition, increasing staff for delivering bills will be of great help in increasing water bill collection. Appointment of engineers in the Juba Station would further increase the technical capacity of the purification and distribution departments. Since the request for appointing new staff for SSUWC HQ and the Juba Station has been submitted to MFEP, proper follow up is necessary to ensure the recruit process to make progress.

5-2. Lessons Learned

5-2-1. Methods of capacity development in a post-conflict country

A prolonged civil war in Sudan severely devastated public infrastructures and institutions including SSUWC. Most of the staff are undereducated while some are even illiterate or innumerate. In order to achieve the efficiency and effectiveness of the Project, it is important to assess the level of capacity and learning needs of C/Ps in the early stage of the Project period and take approaches suitable for the target groups. In the Project, the SOP, O&M manuals, and format of monthly reports have been revised multiple times so that staff can conduct O&M and prepare monthly reports on their own. The JICA Expert Team developed posters and manuals using figures and pictures illustrating operation procedures in order to make these materials simple and understandable for all the staff regardless of their reading ability. The JICA Expert Team spent a long time for teaching basic concepts of O&M as well as proper O&M methodologies, water test, billing and data management. Identifying the C/Ps' level of capacity and taking appropriate approach for their skill levels are essential for capacity development in a post-conflict country.

Annex 1: Evaluation Schedule

Date		Mission	Appointment (plan)	Meeting person
19-May	Sun	Narita→Bangkok		
20-May	Mon	Bangkok→Nairobi→9:25Juba(KQ350)		
		Security Briefing at JICA Office	11:00	Miyagi
		Meeting with JICA Office	11:30	Hanatani,Miyoshi
		Meeting with SSUWC (evaluation member)	15:00	Koak, Tongun, Tuburo
		Meeting with Japanese Experts	16:00	H. Sato
21-May	Tue	Meeting with SSUWC (interview with C/Ps)	9:30-11:30 14:00-15:00	Purification Dep. Laboratory Sec.
22-May	Wed	Meeting with SSUWC (interview with C/Ps)	9:30-11:30	Finance Dep.
		Meeting with GIZ	15:30	Christoph Hagenbruch
23-May	Thu	Meeting with SSUWC (interview with C/Ps)	9:30-11:30	Distribution Dep.
		Meeting with USAID expert at SSUWC (SUWASA office near USAID compound)	15:00	Abdoulaye BARRO
24-May	Fri	Meeting with SSUWC (interview with C/Ps)	9:30-10:30 10:30-11:30	Admin. Dep Santurino Tongun
25-May	Sat	Data Analysis		
26-May	Sun	Data Analysis		
27-May	Mon	Meeting with SSUWC (interview with C/Ps)	10:00-11:00	Simon Koak, Samuel Taban
28-May	Tue	Meeting with SSUWC (interview with C/Ps)	9:30-11:30	Area Manager
		SSUWC Juba (JICA mission)	9:00-9:30	Area Manager
		SSUWC HQ (JICA mission)	14:00	MD, Deputy MD
		USAID		
29-May	Wed	Meeting with SSUWC (interview with C/Ps)	(Reserved)	-
30-May	Thu	Meeting with SSUWC (interview with C/Ps)	(Reserved)	-
31-May	Fri	SSUWC HQ	15:00	MD, Simon Koak Area Manager of the Juba Station
		Meeting with Japanese Experts	16:00	H Sato
1-Jun	Sat	Site survey	9:00-11:30	H. Sato
2-Jun	Sun	Data Analysis		
3-Jun	Mon	Courtesy Visit to MWRI Meeting on M/M Distribution of Evaluation Report	9:00 11:00	Acting Undersecretary /DG for Planning Evaluation team (MD, Act. SG)
4-Jun	Tue	Finalization of Evaluation Report	10:00 -11:00	Evaluation team
		Explanation of Final Evaluation Report Meeting on M/M	13:30-14:30 15:00-16:00	MD Act SG (MWRI)
		Preparation for JCC		
5-Jun	Wed	**JCC (Reporting on Evaluation Results)**	9:30	DG-MWRI MD, CPs-SSUWC
		Signature on Minutes	13:00	DG-MWRI MD-SSUWC
6-Jun	Thu	Report to Japanese Embassy and JICA Office		

Annex 2: List of Interviewees

1. Ministry of Water Resources and Irrigation

Name	Position	Roles in the Project
Eng. Issac Liabwel C. Yol	Under secretary	Chairman
Mr. Laurence Lopula Busuk Muludyang	Director, Urban Water Program	Output 5

2. SSUWC HQ

Name	Position	Roles in the Project
Eng. Chamjok Chung Wiitour	Managing Director	Project Director
Mr. Simon Koak	Office Manager	Output 5
Eng. Santurino Tongun	Director, Commercial and Customer Services	Project Manager
Mr. Christino Abugo	Financial department	Output 5

3. SSUWC Juba Station

Name	Position	Roles in the Project
Eng. Hassan Aggrey Yousif	Area Manager	Output 2
Mr. Elfateh Rihan Surur	Manager, Purification Department	Output 1
Mr. Peter Toburo Nigo	Director, Planning and Project	Output 1
Eng. Cieggan Madding	Distribution Department	Output 2
Mr. Philip Christopher	Distribution Department	Output 2
Mr. Mujun Justin	Distribution Department	Output 2
Mr. Johnthana Wiston	Distribution Department	Output 2
Mr. Sebit Lado Silvano	Manager of Water Quality Laboratory, Purification Department	Output 3
Mr. Alison Moboruk Brown	Senior Inspector of Sales Department	Output 4
Mr. Kenneth Gideon Dakaya	Financial Department	Output 4
Mr. Alexiander Hakim	Financial Department	Output 4
Mr. William Lokuji	Manager of Administration Department	Coordinator

4. Japanese Experts

Name	Position
Mr. Hirotaka Sato	Chief Advisor / Water Utility Management
Mr. Yarai Sato	Water Treatment Plant /Pumping Facilities Operation and Maintenance (1)
Mr. Masashi Kawamura	Transmission and Distribution Facilities Operation and Maintenance
Mr. Moriji Yanagimura	Water Quality Management

5. Development Partners

Name	Position
Mr. Christoph Hagenbruch	GIZ Technical Advisor
Mr. Abdoulaye Barro	USAID SUWASA Team Leader

Annex 3: Inputs

Annex 3-1: Input by the Japanese Side

Annex 3-1-1 Assignment of Experts

Field of Expertise	Name	Dispatched period (M/M)				
		Year 1	Year 2	Year 3	Year 4	Total
Chief Advisor/Water Utility Management	Mr. Hirotaka Sato	3.27	4.47	2.83	2.33	12.90
Water Treatment Plant /Pumping Facilities Operation and Maintenance (1)	Mr. Yarai Sato	2.67	3.00	2.00	2.17	9.84
Pumping Facilities Operation and Maintenance (2)	Mr. Yoshiki Sugiyama	0	1.00	0	0	1.00
Transmission and Distribution Facilities Operation and Maintenance	Mr. Masashi Kawamura	3.03	4.50	3.00	2.00	12.53
Water Quality Management	Mr. Moriji Yanagimura	2.50	2.97	2.00	2.00	9.47
Financial Evaluation/Water Tariff	Mr. Atsuo Ohno	2.50	2.77	2.33	2.00	9.60
Community Development (1)	Mr. Mukibi Steven	2.53	2.83	1.00	1.23	7.60
Coordinator/Community Development (2)	Mr. Hayato Nakazono	3.03	4.13	2.34	1.77	11.26
Total	8 Persons	19.53	25.67	15.50	13.50	74.20

Annex 3-1-2 Training in Japan and the Third Country

1. Training in Japan

No.	Name	Unit	Training Title	Period
1	Eng. Chamjok Chung Wiitour	General Manager of SSUWC HQ (HQ)	Administration of Water Supply Management	December 9 - 16, 2011
2	Eng. Santorino Tangun Roben Unkey	Area Manager*, SSUWC Juba Station (Juba)		
3	Eng. Albert Eluzai Moni	Rural Water Supply, MWRI		
4	Mr. Peter Toburo Nigo	Purification department	O&M of urban water supply system (WTP and water quality)	June 18 – July 12, 2012
5	Mr. Jonathana Winston	Distribution department		June 18 – July 19, 2012
6	Mr. Ciengan Mading	Distribution department	O&M of Urban Water Supply System (Water Distribution and Service)	June 3 – July 6 , 2013

* The title is the one at the time of the training.

2. Third Country Training in Kenya

No.	Name	Unit	Training Title	Period
1	Mr. Philip Christopher	Juba	Installation of service Connections, Leak Repairs and Pipe jointing of Asbestos, Steel, PVC and DCIP	15 – 21 January, 2012
2	Mr. Lazarus Anania	Juba		
3	Mr. Yanga Modi	Juba		
4	Mr. Justin Mujun	Juba		
5	Mr. Johntuno Wiston	Juba		
6	Mr. John Brown	Juba	Repair and Maintenance Works for Pumps, Generators and Blowers	22 – 28 January, 2012
7	Mr. Cosmas Pitia	Juba		
8	Mr. Martin Andrea	Juba		
9	Mr. Martin Rume	Juba		
10	Mr. Hillary Laku Loro	Juba	On the Job Training of Water Treatment (Purification Plant)	15 – 28 January, 2012
11	Mr. George Wani	Juba		
12	Mr. John Sebit	Juba		
13	Mr. Peter Gatluak Deng	HQ	Administration& Human Resource Management	29 July- 4 August, 2012
14	Mr. Biel Nyuot Nhial	HQ		
15	Mr. Veronica Suleiman	Wau		
16	Mr. Francisca James Abiel	Malakal		
17	Mr. Robert Wani Mario	Juba		
18	Mr. Duku David Inyacio.	Juba		
19	Mr. Morris Lado Tongun	Juba		
20	Mr. Christine Moyo Benjamin	Juba		
21	Mr. Daniel Henry Kun	Wau	O&M of Water Distribution	29 July- 4 August, 2012
22	Mr. Natali Albert	Malakal		
23	Mr. Taban Phillip	Juba		
24	Mr. Repent Monday	Juba		
25	Mr. Luica Keji	Juba		
26	Mr. Anjelo Appolo	Juba		
27	Mr. John Garang	Juba		
28	Eng. Samuel Taban Longa	HQ	Customer Care and Public Relation	5 - 11 August, 2012
29	Mr. Peter Pisa Joseph	HQ		
30	Mr. Joseph Alfred	Wau		
31	Mr. Morris Emmanuel Sebit	Juba		
32	Mr. Phillip Martin	Juba		
33	Mr. Kenneth Gideon	Juba		

No.	Name	Unit	Training Title	Period
34	Mr. Augustino Manut Atak	Wau	Customer Meter Management	5 - 11 August, 2012
35	Mr. Tor Douth Dup	Malakal		
36	Mr. Peter Loro	Juba		
37	Mr. Evelino Loro David	Juba		
38	Mr. Casca Lado Simon	Juba		
39	Mr. Gabriel Marko Mangu	Wau	Ware House and Inventory	5 - 11 August, 2012
40	Mr. Khor Yuat Wal	Malakal		
41	Mr. Fredrick Wani Lado	Juba		
42	Mr. Robert Michael	Juba		
43	Mr. Lou Joseph Jamba	Juba	Operation and Maintenance Electro-Mechanical system in Water Utilities	18 – 24 November, 2012
44	Mr. Cosmas Tandrupasi	Juba		
45	Mr. Fahim Khafif Madriu	Juba		
46	Mr. Manash Lokule Wani	Juba		
47	Mr. Peter Karbino Ore	Juba		

Annex 3-1-3 Provision of Equipment and Materials

	Year of procurement	Item	Description	Unit	Amount		
					USD	JPY	SSP
Water Quality							
1	2011	Water Conditioning Laboratory	CEL/850	1	4,387		
2	2011	Pocket Colorimeter	Chlorine Free + Total	3	1,875		
3	2011	Pocket Colorimeter	Iron	1	653		
4	2011	Pocket Colorimeter	Manganese	1	653		
5	2011	Pocket Colorimeter	Ammonia	1	653		
6	2011	Pocket Colorimeter	Nitrate	1	653		
7	2011	Pocket Colorimeter	Fluoride	1	645		
8	2011	Pocket Colorimeter	Dissolved Oxygen	1	653		
9	2011	Conductivity Starter Kit	Conductivity Starter Kit	1	1,413		
10	2011	Portable Turbidimeter	2100Q	1	1,736		
11	2011	Turbidity/Colormeter	2100AN	1	5,882		
12	2011	Still Water Automatic	Still Water Automatic	1	6,178		
13	2011	Handbook	Standard Method	2	539	22,682	
14	2011	Beakers	Glass 1000ml, 6/pk	2	156		
15	2011	Beakers	Glass 250ml	12	60		
16	2011	Flask Erlenmeyer Wide Mouth	Glass 250ml	12	144		
17	2011	Bottle Amber Glass	Amber 237ml, 6/pk	2	38		
18	2011	Bottle Amber Polyethylene	Amber 500ml, 6/pk	1	50		
19	2011	Bottle Amber Polyethylene	Amber 1L, 3/pk	1	38		
20	2011	Cylinder Glass	100ml	10	250		
21	2011	Cylinder Glass	250ml	10	444		
22	2011	Polyethylene Bucket	10L Handle	3	228		
23	2011	Sampler Dipper	500ml 12ft handle	2	348		
24	2011	Jar Tester	Six paddle lab stir, 220V 50Hz	1	5,636		
25	2011	Microscope	Ultra compact handy inverted type (synophthalmia: 10×) (objective : 4×、 10×、 40×)	1		83,633	
26	2012	Hydrochloric acid (HCL) Analytical grade	2.5 litres	2	44		
27	2012	Sulphuric acid (H2SO4) Analytical grade	2.5 litres	4	62		
28	2012	Sodium thiosulfate	500 grams	4	60		
29	2012	Sodium hydroxide pellets	500 grams	1	16		
30	2012	Residual Chlorine		3	105		
31	2012	Alkalinity		1	104		
32	2012	Dissolved Oxygen		4	180		
33	2012	Ammonium		1	165		
34	2012	Nitrate		1	120		
35	2012	Hardness	Low Range	1	25		
36	2012		High Range	1	25		
37	2012	Iron		1	31		
38	2012	Manganese		1	83		
39	2012	Zink		1	90		
40	2012	Copper		1	68		
41	2013	Residua Chlorine		20	760		
42	2013	Dissolved Oxygen		4	184		
43	2013	Ammonium		1	162		
44	2013	Nitrate		1	120		

	Year of procurement	Item	Description	Unit	Amount		
					USD	JPY	SSP
45	2013	Iron (Low Range)		2	70		
46	2013	Manganese		2	166		
47	2013	Zink		1	92		
48	2013	Copper		1	69		
Operatin and Maintenance Toolsand Mterials							
49	2011	Pressure gauge		20		87,000	
50	2011	Welding machine	DC60A-140A, 2.0-3.2mm	1	840		
51	2011	Electrode	3.2mm, 10kg	10	24		
52	2011	Electrode holder		1	12		
53	2011	Earth grip		1	22		
54	2011	Welding cable	20-30m	2	600		
55	2011	Welding goggles		2	24		
56	2011	Welding globes		2	24		
57	2011	Blade for pipe cutting by grinder		10	30		
58	2011	Code reel		3	360		
59	2011	Slide calipers		3	360		
60	2011	Claw bar		3	45		
61	2011	Tapping machine		1	6,800		
62	2011	Vice		3	360		
63	2011	Working platform	to install vice	1	156		
64	2011	Circuit tester		1	120		
65	2011	insulation resistance tester	500/1000V, double range	1	480		
66	2011	Clamp tester/meter	power voltage, electric flow, frequency, resistance	1	120		
67	2011	Jamper cable	for 5A	5	175		
68	2011	Rotating meter		1	220		
69	2011	Vibration gauge		1	850		
70	2011	Noise level meter		1	350		
71	2011	Bar thermometer		1	50		
72	2011	Metal Box		10			1,500
Office Equipment							
73	2011	Projector	VPL-EX100, SONY, Standard Resolution: XGA	1	975		
74	2011	PC (Desktop)	HP S2031a(Monitor), HP500B MT(CPU), OS:Windows 7 Professional Office:Microsoft Office 2010 Professional CPU: Core 2 Duo or more than 2.0GHz HDD: 150GB, Memory 2GB 17 inch screen, Internal DVD-RW, CD-RW Keyboard, Mouse, including Anti-Virus Software	20	24,056		
75	2011	PC (Laptop)	HP G62, hp OS:Windows 7 Professional Office:Microsoft Office 2010 Professional CPU: Core 2 Duo or more than 2.0GHz HDD: 150GB, Memory 2GB Internal DVD-RW, CD-RW Keyboard, Mouse, including Anti-Virus Software, software	2	4,983		
76	2011	UPS	Back-UPS CS 650, APC	20	3,590		
77	2011	Equipmentfor Intranet	iBOOK 1110, WD External HDD 1TB DIR615, D-Link Hub with 4 channels DES-1008D, D-Link Hub with 8 channels	1	3,048		
78	2011	Printer (A4 laser)	HP Color Laserjet CP2025 Laser printer, color	6	4,428		
79	2011	Toner (A4 laser)	for laser printer (No.11), color	18	9,684		
80	2011	Printer (A4 laser)	HP Laserjet P2055dn Laser printer, black and white	6	4,440		

	Year of procurement	Item	Description	Unit	Amount		
					USD	JPY	SSP
81	2011	Toner (A4 laser)	for laser printer (No.13), black and white	18	1,746		
82	2011	Printer (A3 inkjet)	HP Officejet 7000 Inkjet printer, color	1	560		
83	2011	Ink Cartridge (A3 inkjet)	for inkjet printer (No.15), a set of all colors	3	621		
84	2011	Drum Cartridge	Canon Laser Base MF8180C	1	1,550		
85	2011	USB memory stick	imation, Memory 2GB	13	1,040		
86	2011	Plotter	HP Designjet T1200&T770 printer series, Maximum size A0, color	1	6,700		
87	2011	Copy Machine	Kyocera TASKalfa 250ci, Black and white & color, A3, A4, letter size	1	7,900		
88	2011	Photocopy machine table	For Kyocera TASKalfa 250ci	1	2,000		
89	2011	Digital Camera	DSC-W310	1	250		
90	2011	Video Camera	DCR-SR68E LCD-display, Zoom&Focus fuction,	1	5,000		
91	2011	GPS (Global Positioning System)	Mobile Mapper 6, ashtech With Arc Pad 10 OS: Microsoft Windows Mobile,GPS receiver with GPS antenna, Bluetooth Wireless Technology,	1	2,950		
92	2011	Book Shelf	Wooden with 1/2 cabinet	5	6,800		
93	2011		Open bookshelf	5	3,600		
94	2011	Desk	Computer desk	2	1,664		
95	2011	Chair	Computer chair	18	2,592		
96	2011	Files	Record filing for data management	60	720		
97	2011	Drainage Pump	Automatic Water Pump, BLT30CX including 10m pipes	1			1,500
98	2011	Air conditioner	LG Model: HS-C1865SA4	1	1,070		
Flow meters and Pipe Materials							
99	2012	Electromagnetic flow meter	ELECTROMAGNET. FLOW METER KROH NE IP57 DIAM.300 230V OBTIFLUX2000	1	3,330		
100	2011	Flow Meter	Turbine type (diameter 8 inch)	5	7,250		
101	2011	Flow Meter	Turbine type (diameter 6 inch)	1	893		
102	2011	Flow Meter	Turbine type (diameter 4 inch)	1	560		
103	2011	Flow Meter	Turbine type (diameter 2 inch)	1	411		
104	2011	Pipes and Fittings	PVC pipe 225mm x 5000mm	4	628		
105	2011	Pipes and Fittings	PVC pipe 160mm x 5001mm	2	188		
106	2011	Pipes and Fittings	Flange valve 200mm	5	3,875		
107	2011	Pipes and Fittings	Flange valve 150mm	1	460		
108	2011	Pipes and Fittings	Flange valve 100mm	1	307		
109	2011	Pipes and Fittings	Flange valve 50mm	1	225		
110	2011	Flange adapter for GI	8 inch, GIXF, PN16, with bolts and nuts	4	480		
111	2011	Flange adapter for PVC	8 inch, PVCXF, PN16, with bolts and nuts	16	2,240		
112	2011	Flange adapter for PVC	6 inch, GIXF, PN16, with bolts and nuts	4	380		
113	2011	Flange adapter for PVC	6 inch, PVCXF, PN16, with bolts and nuts	4	380		
114	2011	Flange adapter for PVC	4 inch, PVCXF, PN16, with bolts and nuts	4	240		
115	2011	Flange adapter for PE	2 inch, PEXF, PN16, with bolts and nuts	4	180		
116	2011	Coupling	6 inch	4	380		
117	2011	Coupling	4 inch	8	480		
118	2011	Rubber gascket	for 8 inch	20	136		
119	2011	Rubber gascket	for 6 inch	4	22		
120	2011	Rubber gascket	for 4 inch	4	15		

	Year of procurement	Item	Description	Unit	Amount		
					USD	JPY	SSP
121	2011	Rubber gascket	for 2 inch	4	12		
122	2011	Bolts & nuts	M20	144	172		
123	2011	Bolts & nuts	M16	32	22		
124	2011	Washers	for M20	144	19		
125	2011	Washers	for M16	32	3		
126	2012	Turbine flow meter	FLANGED WATER METER WOLTMANN PN 10/16 EPOXY COATED DIAM. 150	3	1,511		
127	2012	Turbine flow meter	FLANGED WATER METER WOLTMANN PN 10/16 EPOXY COATED DIAM. 100	1	322		
128	2012	Sluice Valve	CI FLANGED HAND WHEEL GATE VALVE ND 150 CLOCKWISE CL.PN10-16	3	674		
129	2012	Sluice Valve	CI FLANGED HAND WHEEL GATE VALVE ND 100 CLOCKWISE CL.PN10-16	1	127		
130	2012	Level Gauge	Water level gauge piezometter , submerged type, Monitor model NANODAC, Control panel for setting of monitor and Warning tone for high level of water	1	4,005		
131	2012	Chlorine injection by gravity	GRAVITY DOSING SYSTEM OD 25mm scale 10-100L/H	2	3,750		
132	2012	Bolts & nuts	for flange DN100	4	46		
133	2012	Bolts & nuts	for flange DN150	12	229		
134	2012	Bolts & nuts	for flange DN200	2	52		
135	2012	Female Adaptor in brass for HDPE OD 20 threaded 1/2" BSP		60	385		
136	2012	Female Adaptor in brass for HDPE OD 25 threaded 3/4" BSP		90	608		
137	2012	Female Adaptor in brass for HDPE OD 20 threaded 1" BSP		30	292		
138	2012	Flange Adaptor for PVC	6 inch	7	623		
139	2012	Flange Adaptor for PVC	4 inch	2	120		
140	2012	Gasket	12"	2	45		
141	2012	Gasket	6"	10	55		
142	2012	Gasket	4"	3	11		
143	2012	Coupling	6 inch	3	233		
144	2012	Coupling	4 inch	1	60		
145	2012	Saddle for Asbestos	Main pipe: Asbestos 4", Outlet pipe PE 1/2"	2	120		
146	2012	Saddle for Asbestos	Main pipe: Asbestos 4", Outlet pipe PE 3/4"	3	180		
147	2012	Saddle for Asbestos	Main pipe: Asbestos 4", Outlet pipe PE 1"	1	60		
148	2012	Saddle for Asbestos	Main pipe: Asbestos 6", Outlet pipe PE 1/2"	2	161		
149	2012	Saddle for Asbestos	Main pipe: Asbestos 6", Outlet pipe PE 3/4"	3	241		
150	2012	Saddle for Asbestos	Main pipe: Asbestos 6", Outlet pipe PE 1"	1	80		
151	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 3", Outlet pipe: PE 1/2"	2	37		
152	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 3", Outlet pipe: PE 3/4"	3	56		
153	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 3", Outlet pipe: PE 1"	1	19		
154	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 4", Outlet pipe: PE 1/2"	2	45		
155	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 4", Outlet pipe: PE 3/4"	3	67		
156	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 4", Outlet pipe: PE 1"	1	22		

	Year of procurement	Item	Description	Unit	Amount		
					USD	JPY	SSP
157	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 6", Outlet pipe: PE 1/2"	2	54		
158	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 6", Outlet pipe: PE 3/4"	3	82		
159	2012	Combines Ferrulle Saddle for PVC	Main pipe: PVC 6", Outlet pipe: PE 1"	1	27		
160	2012	Ball Valve	1/2"	20	99		
161	2012	Ball Valve	3/4"	30	297		
162	2012	Ball Valve	1"	10	155		
163	2012	Valve Box	φ75, H=500-600mm	20	2,346		
164	2012	Valve Box	φ75, H=700-900mm	10	1,544		
165	2012	Elbow for PE Pipes 90 degree	1/2"	40	100		
166	2012	Elbow for PE Pipes 90 degree	3/4"	60	189		
167	2012	Elbow for PE Pipes 90 degree	1"	20	78		
168	2012	Male Socket	1/2"	20	30		
169	2012	Male Socket	3/4"	30	56		
170	2012	Male Socket	1"	10	23		
171	2012	Female Socket	1/2"	20	37		
172	2012	Female Socket	3/4"	30	71		
173	2012	Female Socket	1"	10	31		
174	2012	Socket	1/2"	10	26		
175	2012	Socket	3/4"	15	51		
176	2012	Socket	1"	5	28		
177	2012	PVC insert machine		2		101,178	
178	2013	Wall mounted converter and display model IFC 100W from Krohne		1	968		
179	2013	Conversion KIT from Compact model to separate display mode		1	228		
180	2013	Cable for flowmeter alimentation 400V		1	1,010		
181	2013	Cable for Display information from flowmeter to IFC 100 (4-20mA)		1	701		
182	2013	Waterproofing kit for flowmeter OPTISONIC 2100 C		1	92		
Manuals and textbooks							
183	2011	Water Distribution System Operator Training Handbook; Third Ed.	AWWA	1	80		
184	2011	Water Distribution System Operation and Maintenance: A Field Study Training Program, Fifth Edition	AWWA	1	65		
185	2011	Water Treatment Plant Operation Volume I	AWWA	1	65		
186	2011	Water Treatment Plant Operation Volume II	AWWA	1	65		
187	2011	Water Supply Operations: Textbook Set: AWWA Water Operator Training Textbooks (5 books)	5.1 Water sources (No. 1955)	1	498		
188	2011		5.2 Water Treatment (No. 1956)	1			
189	2011		5.3 Water Transmission and Distri	1			
190	2011		5.4 Water Quality (No. 1958)	1			
191	2011		5.5 Basic Science Concepts and Ap	1			
192	2011	1. Making Public Enterprises Work: From Despair to Promise: A Turn Around Account		1		9,675	
193	2011	2. Water Rates, Fees, and the Legal Environment, 2nd Edition		1		10,498	
194	2011	3. M1 Principles of Water Rates, Fees and Charges, 5th Edition		1		13,815	

	Year of procurement	Item	Description	Unit	Amount		
					USD	JPY	SSP
195	2011	4. M6 Water Meters-selection, Installation, Testing, and Maintenance, 4th Edition		1		10,281	
196	2011	5. M5 Water Utility Management, 2nd Edition		1		12,897	
197	2011	6. M20 Water Chlorination and Chlorination Practices and Principles, 2nd Edition		1		11,138	
198	2011	7. M22 Sizing Water Service Lines and Meters, 2nd Edition		1		10,281	
199	2011	8. M23 PVC Pipe—Design and Installation, 2nd Edition		1		12,102	
200	2011	9. M37 Operational Control of Coagulation and Filtration Processes, 3rd Edition		1		4,957	
201	2011	10.Teach Yourself VISUALLY Access 2010		1		2,865	
Communication/Transportation							
202	2012	Motor bike	SENKE CG 125cc	6			22,800
203	2013	Motor bike	SENKE CG 125cc	2	2,200		
204	2013	Wakie-talkies	Base station	1	1,526		
205	2013	Wakie-talkies	Radia	6	4,080		
206	2013	Wakie-talkies	Amprifier	1	3,599		
207	2011	Storage yard		1			3,365
Sub Total					208,123	393,002	29,165
						USD 3,907	USD 9,845
Grand Total					USD 221,875		

USD1.00= JPY 100.6 (2013.0530)

USD1.00= SSP 2.9623 (2013.04)

Annex 3-1-4 Operational Expenses by Japanese Side

Item	Amount (JPY)
Secretary	2,814,506
Technical Staff	335,250
Local Consultant (Juba University)	562,413
Computer Training (Juba University)	503,000
Inspection of Water Supply Facility in Malakal	291,794
Inspection of Water Supply Facility in Wau	255,414
Seminar (2nd JCC, progress seminar, 201104)	520,102
Seminar (3rd JCC, tariff seminar, 201111)	222,439
Seminar (4th JCC, progress seminar,201202)	190,516
Seminar (5th JCC, progress seminar,201211)	181,687
Training in Kenya	5,107,695
Equipments from recipient country	10,258,886
Transportation for Equipments	823,000
TOTAL	22,066,702

Annex 3-2: Input by the South Sudanese Side

Annex 3-2-1 Assignment of South Sudanese C/Ps

Role in the Project	Main C/P	Position/Organization
Chair	Eng. Isaac Liabwel C. Yol	Under secretary, MWRI
Project Director	Eng. Chamjok Chung Wiitour	Managing Director, SSUWC HQ (HQ)
Project Manager	Eng. Santurino Tongun	Director, Commercial and Customer Services (HQ)
Output 1	Mr. Elfateh Rihan	Manager, Purification Department, Juba Station (Juba)
	Mr. Peter Toburo Nigo	Director, Department of Planning and Projects (Juba)
Output 2	Eng. Cieggan Mading	Manager, Distribution Department (Juba)
Output 3	Mr. Sebit Lado Silvano	Manager, Water Quality Laboratory (Juba)
Output 4	Mr. Alexander Dalson Hakim	Manager, Financial Department (Juba)
	Mr. Simon Boss Yoasa	Financial Department (Juba)
	Mr. Alison Moboruk Brown	Financial Department (Juba)
Output 5	Eng. Samuel Taban	Director General, Administration and Finance (HQ)
	Mr. Simon Koak	Office Manager (HQ)
	Eng. Olwac Mugo	SSUWC HQ
Overall Coordination	Eng. Hassan Aggery Yousif	Area Manager, Juba Station
	Mr. William Lokuji	Director, Administration Department, Juba Station

Annex 3-2-2 Operational Expenses by South Sudan

Category	Items	Cost (SSP)
Direct power line from power station	Power line, pole, and registration fee (for the Juba Station and Konyokonyo)	195,000
Remodeling of room	Repair of a computer room (HQ)	5,000
Motor bicycle	Registration fee (8 numbers)	6,400
Walkie Talkie	Registration fee	4,830
Pipe accessories	Fitting and protection	5,000*
Water Meter	14 meters	2,000*
	Total	218,230

* The cost is an estimate since these items were provided in kind.

Annex 4: Evaluation Grid (Results of the Evaluation)

SECTION I: Project Achievements

Evaluation Questions		Results
Main Questions	Sub Questions	
Prospect for Achieving the Overall Goals	To what degree have the Overall Goals been achieved? **Overall Goals:** 1. The quality of the water supply service extended by SSUWC-Juba is improved. 2. The management capacity of SSUWC HQ is improved.	**OVI 1. The customer satisfaction on water supply service of SSUWC-Juba station is enhanced.** • According to the Social Condition Survey for Water Supply Service conducted by the Project, the rate of customer satisfaction on UWC's water supply service has been increased from 22.4% percent in 2010 to 36.4% in 2013. Staff of the Juba station were informed by customers that the water quality has been improved. Reasons for dissatisfaction of UWC's water supply service include irregular water supply, short service hours, insufficient water supply and low water pressure. **OVI 2. All essential performance indicators are further improved from the final date of the Project.** • PIs, except those linked with the power supply situations, have been greatly improved since the Project started. • Some PIs such as "Ratio of actual sampling days to required total weekly sampling days" and "Ratio of actual samples to required total weekly samples" have been reached 100% and it is likely that sampling will be carried out as regular routine of lab staff unless external factors affect the sampling activities. **OVI 3. All reports and plans submitted from area stations are assessed and guidance is given back to them.** • According to "The Roles of SSUWC Headquarters and Reporting and Planning system" formulated by the Project based on the Provisional SSUQC Order, SSUWC HQ has been evaluating and providing feedback on reports and plans submitted by the Juba station. SSUWC HQ utilizes the evaluation checklist developed by the Project and follows procedures of review and evaluation. Since SSUWC HQ has carried out the reviewing process for a couple of times, it is likely that SSUWC HQ is able to assess reports and plans from other area stations. • As for the proper guidance, SSUWC HQ is in the process of surveying and understanding the status of O&M in each of the area stations. Since reviewing reports and providing guidance to area stations is the newly established role for SSUWC HQ, it is still unclear if SSUWC HQ can provide detailed analysis and appropriate guidance to each respective area station.
Prospect for Achieving the Project Purpose	To what degree has the Project Purpose been achieved?	**Project Purpose:** The management capacity of SSUWC-Juba station is enhanced through capacity development on operation and maintenance of water supply facilities. **OVI 1. 80% of 25 essential performance indicators set in the annual plan which are measurable at the SSUWC Juba station is improved compared to the 2011 average. (Essential performance indicators is attached with baseline data of average value in 2011)** • Except for the PIs that are determined by situations of power supply and accessibility to fuels, all the PIs has been improved. • Some of the 25 PIs overlap. When one PI is met, other PI automatically fulfilled.
Achievement levels of the Outputs	To what degree has Output 1 been achieved? **Output 1:** Capacity of SSUWC-Juba station with respect to operation and maintenance of water intake and treatment facilities is improved.	**OVI 1-1. Monthly reports and annual reports in which O&M data is compiled.** • SSUWC staff daily collect data on operation of WTP and intake pumping station including the volume of treated water, chlorine consumption, and operation of generators, which are recorded on the data format prepared by the Project. In the end of the month, a staff compiles data and develops monthly reports. In the purification department, while only one staff is able to develop monthly reports, he is training other staff of the department in inputting data into an excel sheet, analyzing the data, and preparing reports. **OVI 1-2. Annual plan on water treatment plant.** • With support by the JICA Expert Team, main C/P developed the annual plan in 2011 and 2012. The annual plan include performance targets in water quality, water production, and pump operation, foreseeable problems, activities for addressing problems, and required resources. the JICA Expert Team have provided practical training in the development of annual plan as well as in proper O&M in WTP including determining appropriate chlorine dosing rate and operating WTP according to schedule. The format of annual plan has been revised and improved so that staff can develop plans on their own after the completion of the Project.

Evaluation Questions		Results
Main Questions	Sub-Questions	
		OVI 1-3. The number of staff who acquired adequate O&M skills for WTP increases from 0 to 11 persons. • According to the results of the oral and writing examination on O&M of WTP in March 2013, the number of staff who acquired adequate O&M skills for WTP was eight out of six managers and 15 shift operators. the JICA Expert Team provided supplementary training for those who did not meet the minimum scores on the examination so that staff understand proper O&M procedures. After the supplementary training, the number of staff with adequate O&M skills increased to eleven. **OVI 1-4. Plant average operating hour per day increases from 17.9 hours (2011 average) to 22 hours/day** • Staff of each department calculate possible operation hours of WTP and pump stations based on the income amount from collected water tariff, revise the operation plans, and manage the operation of the facilities accordingly. Although it is difficult to achieve target operation hours defined in the PDM until the end of the Project period without stable power supply, staff operate water supply facilities according to the plans using acquired knowledge and skills. • SSUWC currently purchases fuel using the income from water tariff. The current average plant operating hour per day is 13.7 hours per day on average, which is expected to be increased as the income from water tariff increased. • When the baseline data was collected, SSUWC was receiving relatively stable supply of electric power, which allowed WTP to be in operation at 17.9 hours per day on average. The target plant operating hour (22 hours/day) of OVI 1-4 was determined based on the assumption on the stable power supply from the city at the time of the baseline survey. Although the direct line from the city power was connected in January 2012, the power supply was unstable. Furthermore, border disputes over oil caused an interruption of the power supply to SSUWC in January 2013. Under the fiscal austerity, there is no provision of fuel from the government. **OVI 1-5. The monthly average ratio that the quality of treated water with respect to turbidity is below 5 NTU increases from 90% to 100%.** • The turbidity stays below 5 NTU for 100% of the day of the month compared to 79% in 2001. • The turbidity of raw water during rainy season tends to be high and fluctuate greatly. the JICA Expert Team trained staff on operation of WTP upon the high turbidity. As a result, the turbidity is under control. **OVI 1-6. The monthly average ratio that the quality of treated water with respect to residual chlorine falls in the range between 0.7 mg/l and 1.2 mg/l increases from 10% to 80 %.** • The ratio of residual chlorine falls in the target range (0.7 – 1.2 mg/l) has been improved from 31% in 2011on average to 85% in February 2013. • The Project replaced the chlorine injectors and the JICA Expert Team provided training in chlorine injection. The fluctuation of the treated water volume due to power cuts poses difficulties in determining the appropriate amount of chlorine. The purification department checks the residual chlorine at each shift and is trying to maintain the residual chlorine in the target range at all times.
Achievement levels of the Outputs	To what degree has Output 2 been achieved? .	OVI 2-1. **Monthly reports and annual reports in which O&M data is compiled.** • SSUWC staff daily collect data on operation of transmission and distribution facilities including the volume of transmission water flow, cases of water leakage and repairs, and the number of installation or replacement of pipes, which are recorded on the data format prepared by the Project. In the end of the month, a staff compiles data and develops monthly reports. OVI 2-2. **Annual operation and maintenance plan on O&M of water transmission and distribution facilities.** • With support by the JICA Expert Team, main C/P developed the annual operation and maintenance plan in 2011 and 2012. The annual plan include performance targets in transmission water flow and repairs of water leakages, foreseeable problems, activities for addressing problems, and required resources. the JICA Expert Team have provided practical training in the development of annual plan as well as in proper O&M in water transmission and distribution including repair of flow meter and pipe and the use of GPS/GIS for recording water leakage and newly installed distribution pipes. The format of annual plan has been revised and improved so that staff can develop plans on their own after the completion of the Project.

Evaluation Questions		Results
Main Questions	Sub Questions	
Achievement levels of the Outputs	**Output 2:** Capacity of SSUWC-Juba station with respect to operation and maintenance of water transmission and distribution facilities is improved.	OVI 2-3. **The number of staff who acquired adequate O&M skills for transmission and distribution increases from 0 to 10 persons.** • According to the results of the oral and writing examination on O&M skills for transmission and distribution in March 2013, the number of staff who acquired adequate O&M skills for transmission and distribution facilities was ten out of 13 staff of the distribution department. the JICA Expert Team provided supplementary training for all the staff who took the examination so that staff achieve better understanding on proper O&M procedures on water transmission and distribution. OVI 2-4. **Application of a formulated Pump Operation Plan by the Project is started in 2012.** • While the first version of the Pump Operation Plan was developed in the middle of 2012, it was difficult to treat and distribute water according to the plan due to the unstable power supply. Since January 2013 when the city power was completely interrupted, SSUWC has been operating pumps using generators according to the Pump Operation Plan which has been revised and updated by SSUWC staff.
	To what degree has Output 3 been achieved? **Output 3:** Capacity of water quality management of SSUWC-Juba station is improved.	OVI 3-1. **Water quality management report (monthly and annual) in which water quality monitoring data is compiled.** • Water testing lab staff collect samples daily from WTP and weekly from pump stations and public taps, and conduct water test on turbidity, residual chlorine, pH, conductivity, Total Dissolved Solid (TDS) and color. Staff input the results of the water test in the data format prepared by the Project. In the end of the month, a staff compiles data and develops monthly reports. OVI 3-2. **The number of staff who acquired adequate water quality test skills increases from 0 persons to 2 persons.** • According to the results of the examination on water quality test in March 2013, the number of staff who acquired adequate water quality test skills was two. The examination evaluated the staff' understanding on the water quality test method of each parameter and calibration of equipment as well as skills on sampling, water test, and data input and organization.
	To what degree has Output 4 been achieved? **Output 4:** Understanding of financial conditions of SSUWC-Juba station is enhanced.	OVI 4-1 **Revenue collection reports are prepared monthly.** • In the beginning of the month, a staff compiles data collected in the previous month and develops monthly reports. Staff have been preparing monthly reports since September 2011 and the routine of compiling information to develop reports is well established. Through the activities of surveying the baseline data, SSUWC Juba station has gained better understanding on financial conditions, status of installed water meter, and the level of customer satisfaction. OVI 4-2 **Recommendations on revenue collection improvement are made.** • Based on the analysis of the baseline survey on financial conditions of the Juba station, recommendations on revenue collection improvements were put forth in the budget plan and the annual plan of the Juba station. • In particular, the Project developed customer ledger database to organize customers' information and issue bills, which improved efficiency of tariff collection. In the financial department, 5 staff can manage customer ledger and issue bills. • The financial department started to update and reorganize customer ledger, and install meters for introducing the metered system as opposed to the current flat rate system. OVI 4-3 **Management method of public water tap stands is established.** • Based on the pilot operation and studies on management methods of public water tap stands, the Project recommended that the public water stands be managed by individual operator based on a three-month or six-month contract. Each operator is required to log daily sales in the form developed by the Project, which are checked by SSUWC staff every month. From the sales of the public taps, SSP 4 per cubic meter is to be collected by SSUWC. • In regards to management method of tanker filling stations, due to the large volume of daily sales, tanker filling stations are managed by private companies. The operators are required to report to SSUWC daily and settle the payment to SSUWC.

Evaluation Questions		Results
Main Questions	Sub Questions	
Achievement levels of the Outputs	To what degree has Output 5 been achieved? **Output 5:** Capacity of SSUWC-HQ to support SSUWC-Juba station is enhanced.	OVI 5-1. **SSUWC HQ examines the monthly reports submitted by SSUWC Juba station every other month.** • According to "The Roles of SSUWC Headquarters and Reporting and Planning System" formulated by the Project, SSUWC HQ organizes the review meeting with the management staff of the Juba station, examines monthly reports submitted by the Juba station, and provides feedback every month. OVI 5-2. **The number of annual reports and plans that SSUWC HQ examined becomes 2 each.** • SSUWC HQ reviewed and assessed annual report and plan of Juba station in 2011 and 2012. The Juba station is in the process of preparing the annual report of the year 2012/13 and the annual plan for the year 2013/14. OVI 5-3. **The existing water supply facilities and services are inputted in to the established database.** • The Project conducted a study on the Wau and Malakal station to collect information on their facilities and status of service delivery. Along with the information on the Juba station, the data was compiled in a report. The Project did not conduct survey in other area stations due to safety concerns.
Achievement of Inputs	Have the Japanese side's inputs been allocated as planned?	• **Personnel (Japanese the JICA Expert Team):** The Japanese side has assigned eight the JICA Expert Team to the Project in the fields of: Chief Advisor/Water Utility Management, Water Treatment Plant /Pumping Facilities Operation and Maintenance (1), Pumping Facilities Operation and Maintenance (2), Transmission and Distribution Facilities Operation and Maintenance, Water Quality Management, Financial Evaluation/Water Tariff, Community Development (1), Coordinator/Community Development (2) (See Annex 3-1-1 Assignment of the JICA Expert Team). • **Training in Japan and Kenya:** The Japanese side has provided overseas training to 50 staff members (3 people in Japan, and 47 people in Kenya) from MWRI, SSUWC HQ, Juba station, Wau station and Malakal station (See Annex 3-1-3 Training in Japan and Kenya). • **Provision of equipment and materials:** The Japanese side has provided equipment necessary for O&M of facilities (e.g. water quality test kit, chlorine injector, and flow meters), motor bikes, office supplies and equipment (e.g. a photocopier, desktop computers, and printers), and other machinery and equipment necessary for the implementation of the Project, which amounted to Japanese Yen (JPY) USD 220,829 (See Annex 3-1-4 Provision of Machinery and Equipment). • **Construction of Public Water Tap Stands and Flow Meter Chambers** The Japanese side has constructed three public tap stands and 11 chambers for flow meters, which amounted to USD 124,899. • **Operational Expenses:** The Japanese side has allocated the total amount of JPY 22,066,702 (Approximately USD 168,578.59) for the operational costs of project activities (See Annex 3-1-5 Japanese Side's Operational Costs).
	Have the South Sudanese side's inputs been allocated as planned?	• **Counterpart personnel:** The South Sudanese side has assigned one Chair, one Project Director, one Project Manager, and 12 SSUWC members from SSUWC HQ and the Juba station as C/Ps to the Project (See Annex 3-2-1 Assignment of C/P Personnel). • **Facilities:** The South Sudanese side has provided a room in SSUWC Juba station for Japanese the JICA Expert Team. • **Local cost:** The South Sudanese side has allocated the total amount of SSP 218,230 for the operational costs of project activities (See Annex 3-2-2 South Sudanese Side's Local Costs).

SECTION II. Implementation Process

Evaluation Questions		Results
Main Questions	Sub Questions	
Implementation of Activities	To what degree have project activities been implemented as planned?	• The Project activities have been implemented mostly as planned. • Some activities of the Project have been interrupted due to the political and fiscal situations around the Independence in July 2011. The plan of activities were rescheduled and resumed in September 2011. • The Project hired a university processor to provide basic English training for staff of the Juba station.
Project management	Are there any issues with the project management? Has there been an effective communication and information sharing among CP (MWRI, SSUWC HQ, and Juba station) and between CP and the JICA Expert Team?	• Project monitoring: The Joint Coordination Committee (JCC) was held annually to monitor the overall progress of the Project. • Communication: The Project has been conducted with an effective and open communication between the JICA Expert Team, SSUWC HQ and the Juba station staff members. C/Ps and the JICA Expert Team have organized weekly meetings and seminars to share and discuss the results of completed activities, foreseeable issues and countermeasures that should be taken by SSUWC HQ and the Juba station, through which C/Ps' strong ownership of and commitment to supplying safe water have been developed. Despite their short-term assignment, the JICA Expert Team arranged their fieldwork schedule to minimize the absence from SSUWC Juba station and encouraged C/Ps to attend weekly meeting, which resulted in establishing routine of organizing weekly meetings by all the department heads of the Juba station without fail. • Method of Capacity Development: the JICA Expert Team made various efforts for effective technology transfer in order to maintain motivation among C/Ps and promote capacity enhancement which resulted in establishing routine of organizing weekly meeting among staff with limited English proficiency and basic arithmetic skills, which was pointed out in the Mid-Term Review as a contributing factor to low participation of C/Ps in training sessions. In order to promote understanding of subject matters among Arabic speaking staff, the JICA Expert Team gave specific examples and cases as to which actions to be taken in a case of given situations, and provided visual aids including tables and simple figures demonstrating proper O&M of facilities. The Project assistant staff and SSUWC's English speaking staff helped the JICA Expert Team in interpreting the training sessions for staff with limited English comprehension. After multiple revisions based on discussions with C/Ps, SOPs and manuals were prepared with the focus on simplicity and user-friendliness. Working together with the JICA Expert Team who have a high level of diligence and persistence, C/Ps learned O&M techniques in implementation as well as time management, problem solving and the importance of neatness of facilities and offices. In order to enhance C/Ps' motivation, the JICA Expert Team occasionally provided incentives for C/Ps, for example, giving an award to the staff who scored high on the test after training and adjusting the timing of the Third Country Training and provision of equipment.
	Have SSUWC-HQ and SSUWC-Juba demonstrated an adequate level of ownership to enhance their management capacity?	• Both SSUWC-HQ and the Juba station demonstrate a high level of ownership to enhance their management capacity. Weekly meetings organized every week among HQ and the management staff of the Juba station are considered to be a platform for discussions and information sharing. At weekly meetings, each department understands activities and issues of other departments, draws recommendations, and comes up with next plans. According to the questionnaires and interviews with C/Ps, weekly meetings function effectively to determine the direction of SSUWC and develop collective understanding on SSUWC's objectives and priority. • Through training of the Project, managers of each department have acquired an adequate level of O&M skills for WTP, pumping station, water transmission and distribution facilities. Managers are highly motivated that they voluntarily train staff in their departments on proper O&M.
Follow-ups of Recommended Actions by the Mid-Term Review	To what extent have the **five actions recommended to be taken by the end of the project period in the Mid-term review** been taken by the Project?	**(1) Strengthening public relations** • The Project conducted several PR activities. The Project hired a local musician and developed an awareness-raising song called "Water is Life." The Juba station invited 60 students from local elementary and middle schools for observation of WTP. Staff of the Juba station created posters to describe the function of water supply facilities. The local TV station covered the visit of students to the Juba station, which was broadcasted locally. The Project organized a picture contest and spoke the importance of preserving water to the public.

Evaluation Questions		Results
Main Questions	Sub Questions	
		(2) Regularly participating in training/ meetings (CP), offering additional classes to fill the capacity gap (the JICA Expert Team), and conducting a capacity assessment of trained SSUWC staff • As suggested, South Sudanese side participated in the Project activities more regularly and proactively than before the Mid-Term Review. Using the Project assistants as translators, the JICA Expert Team provided training to improve basic skills of staff so that proper O&M is carried out by staff of Juba station even after the completion of the Project. The capacity assessments of trained staff have been implemented to confirm the level of their skills and knowledge in respective field. **(3) Providing additional equipment** • Additional equipment including chlorine injectors and electromagnetic flow meters have been provided to enhance the effectiveness of O&M activities. **(4) Securing budget for O&M activities** • Securing budget for continuous O&M activities seems to be the most difficult element. Neither the expenditures for reagent and the domestic travel for staff of area stations outside Juba City (as pointed out by the recommendation of the Mid-Term Review), nor the in-kind provision of chemicals and fuel for generators have been made under the fiscal austerity. • In exchange, the Juba Station has been allowed to retain the full amount of the revenue from fee collection and use it for O&M. • With a view to achieving the goal of 24 hour pump operation by January 2014, the Juba Station is in the midst of taking a number of measures in increasing fee collection including charging fees according to the revised water tariff, adopting efficient billing strategy, and installing the water meters. **(5) Recruiting sufficient number of qualified staff** • Related to the fiscal status, the staff in the water test laboratory in the Juba station and the Director-level management staff in the HQ have not been appointed.

SECTION III: Evaluation by the Five Criteria

	Evaluation Questions		Results
	Main Questions	Sub Questions	
Relevance	Relevance with the Government policy of South Sudan	Has the Project been in line with the priority of development policies of the Government of South Sudan?	• Given the above-mentioned situation, the Republic of South Sudan (ROSS) sets the provision of urban water and sanitation as one of the priority areas for the nation's socioeconomic development in its "National Water Policy" (2007). In the Policy, the Government aims to promote efficient, equitable and sustainable development and use of available water resources, and effective delivery of water and sanitation services. In particular, ROSS is committed to ensuring rapidly growing urban populations benefit from access to safe, affordable and reliable water supply and sanitation services. The specific objectives in the Policy include: to promote technical and management training of staff working at all levels in urban water and sanitation services; and to improve the financial sustainability of urban water systems through the introduction of efficient management practices.
	Relevance with the needs of beneficiaries	Has the Project Purpose been in line with the needs of the target group? Have the needs of the target group been high? **Target Group:** SSUWC Headquarters and Juba station staff	• SSUWC operates and maintains water supply facilities that consist of water treatment, transmission and distribution facilities and also collects water tariff. However, it has become difficult to distribute safe water in an efficient manner due to lack of knowledge and skills about the operation and maintenance of water supply facilities, ad-hoc measures taken as a result of insufficient planning of operation and maintenance, lack of inspection and confirmation process of supplied water quality, lack of understanding of the water supply status in the Juba city, lack of water distribution management for equal water distribution, and lack of necessary maintenance materials and budget, in addition to the degraded facilities. Moreover, the revenue collection system with handwritten ledgers is very inefficient and there is no adequate budget or annual plan for operation maintenance. The Project which aims to strengthen the management capacity of SSUWC Juba station is in line with the needs of South Sudan.

Evaluation Questions			Results
	Main Questions	Sub Questions	
Relevance	Relevance with the needs of beneficiaries	Has the Project been in line with the needs of the end beneficiaries, i.e. people living in the water supply service areas of SSUWC-Juba station (Approximately 400,000)?	• The Project is in line with the needs of the end beneficiaries since urban water supply had not been adequately provided in Juba due to the absolute lack of purified water and inappropriate O&M of water distribution system. The Juba station with the water treatment capacity of 7,200 m^3 per day supplies treated water primarily to businesses and factories in the city, resulting in the water supply coverage of approximately 8% of population in the service areas. People rely their drinking water on untreated river water distributed by water tankers and water with high level of salt from shallow well. With the rapid increase in population of Juba, it was the urgent needs for the Government to provide adequate and reliable water services to people living in the water supply service areas.
	Relevance with the Japan's ODA Policy	Has the Project been in line with the Japanese Government's assistance policies for South Sudan?	The Project is in line with the Japan's assistance policies for South Sudan. • Japan's assistance policy for South Sudan sets "Assistance for Basic Human Needs (BHN)" as one of the three priority areas for its development assistance towards South Sudan, which constitutes part of the Japan's assistance policy to Sudan in the consolidation of peace adopted at the first Sudan consortium in 2005 in Oslo. As part of the assistance for BHN, the aid policy for South Sudan aims at the enhancement of public service delivery including the improvement of water supply systems. Japan is committed to providing safe water to 6.5 million people in South Sudan, which was expressed at the Fourth Tokyo International Conference on Africa Development (TICAD IV) in 2008.
	Comparative empirical and technological advantage of Japan's cooperation	Does Japan have technological and empirical advantages in operation and maintenance of water supply facilities in South Sudan?	• Japan has sufficient empirical and technical advantages for strengthening O&M of water supply facilities in Africa. • Japan has been providing technical assistance in improving water supply services since pre-independence of South Sudan. • This Project is built on findings and analysis from the Emergency Study on the Planning and Support for Basic Physical and Social Infrastructure in Juba Town and the Surrounding Areas (2006-2008) and the Juba Urban Water Supply and Capacity Development Study (2007-2009).
Effectiveness	Achievement of the Project Purpose **Project Purpose:** The management capacity of SSUWC-Juba station is enhanced through capacity development on operation and maintenance of water supply facilities.	To what degree has the Project Purpose's OVI been achieved?	See Section 1: Project Achievement
		What is the prospect of achieving the Project Purpose by the end of the Project period?	• The prospect of the Project Purpose being achieved by the end of the project is relatively high based on the achievement levels of the Project Purpose's indicators. • The preparation of monthly report based on regular data collection became a part of routine activities of each department.
		To what degree was the achievement of the Project Purpose attributable to the successful achievement of the Outputs?	• The five Outputs cover all the components (O&M of water intake and treatment facilities [Output 1], O&M of water transmission and distribution facilities [Output 2], water quality management [Output 3], financial management [Output 4] and SSUWC HQ's support system to the Juba station [Output 5]) that are necessary to enhance the management capacity of SSUWC. • The successful production of the five Outputs is directly linked to the achievement of the Project Purpose. As discussed in the "3-1-2 Achievement of the Outputs" section, the most of the expected Outputs have been either achieved or mostly achieved, it is evaluated that capacity in operation and management of SSUWC Juba station and a support system by SSUWC HQ have been improved.

	Evaluation Questions		Results
	Main Questions	Sub Questions	
Effectiveness		Have the Important Assumptions for achieving the Project Purpose been fulfilled?	**Important Assumptions:** (1) Any significant damage to water supply facilities is not caused. (2) Raw water quality is not deteriorated significantly. (3) Raw water flow is not decreased significantly. • At the time of the Terminal Evaluation, no significant damage to water supply facilities or changes of raw water in quality and quantity have been reported. • According to questionnaires and interviews, it was confirmed that two generators, the power source of the Juba station, are getting decrepit and require replacement. The generators are for an emergency purpose as a back-up for the regular electric supply; however, the Juba station is currently using the generators as the regular power source, which accelerates deterioration.
Efficiency	Contributing factors	To what degree has each Output been produced?	See Section 1: Project Achievement
		Have there been any other factors that contributed to the achievement of the Project Purpose?	• Urban Water Working Group (UWWG) was established in SSUWC HQ in June 2011 upon the recommendation by the JICA Expert Team. UWWG holds monthly meeting with MWRI, SSUWC HQ, the Juba station, and relevant donors and NGOs to share information and discuss issues in the urban water sector.
	Hindering factors to Effectiveness	Have there been any other factors that impeded the achievement of the Project Purpose?	• The unstable and insufficient power supply impeded the achievement of the Project Purpose.
	Causality of Inputs and Outputs	Have Project activities been appropriately conducted in terms of their timing, duration, and quality to produce planned Outputs?	• Despite the unstable power supply, most Project activities have been appropriately conducted in terms of their timing, duration and quality.
	Achievement of Outputs	Have the Important Assumptions for achieving the Outputs been fulfilled?	**Important Assumptions:** (1) The current budget of SSUWC-Juba station is not decreased. (2) Counterparts do not resign from training course and do not get transferred. (3) Custom clearance process does not significantly delay import of equipment from overseas. (4) The power supply condition to water supply facilities is not worsened from the current level. (5) The roles of SSUWC are not changed. • No significant delay of custom clearance process or changes in the SSUWC's role have been reported. • Since the fiscal year 2012/13, the budget for the Juba station has been greatly decreased, which caused the reduction of the operation hour of WTP and pump stations. • Personnel transfer occurred quite frequently throughout the Project period. While the JICA Expert Team train staff of each department in groups and prepared simple and clear SOP for all the staff to understand and follow, managers of respective department tried to continuously develop staff's skills and knowledge in order to continue proper O&M in the face of personnel transfer. • As discussed in the Achievement Level of Output 1 above, the power supply has been completely interrupted since January 2013. The Project has changed operation plans to adjust the operation hours of WTP and pump stations.

	Evaluation Questions		Results
	Main Questions	Sub Questions	
	Appropriateness of Inputs by Japan	How appropriate has the assignment of the JICA Expert Team been in terms of the number, their expertise and capabilities, and the dispatched periods and timings?	• The assignment of the JICA Expert Team has been appropriate in terms of the number, expertise, and dispatched periods and timings. • In spite of limited dispatched periods, the JICA Expert Team adjusted the timing of dispatches to minimize the absence of the JICA Expert Team from SSUWC Juba station throughout the Project period.
Efficiency	Appropriateness of Inputs by Japan	How appropriate has CP training in Japan and Kenya been in terms of the number of participants, training contents, and the dispatched period and its timing?	• C/P training in Japan and Kenya have been appropriate and effective in terms of the number of participants, training contents, and the dispatched period and its timing. • C/P training in Kenya was organized three separate occasions as incentives for active involvement in the Project activities. • The participants in the C/P training in Japan and Kenya prepared a report and gave a presentation to share their experience with staff in SSUWC HQ and the Juba station upon their return. • Inspired by the practices of the Kenya Water Institute (KEWI), SSUWC has recently established the customer service department as a structure to keep the record of customers' feedback and provide proper appropriate services.
		How appropriate has the provision of machinery and equipment by the Japanese side been in terms of its quality, quantity and timing?	• The provision of machinery and equipment by the Japanese side has been appropriate in terms of its quality, quantity and timing. • The Japanese side provided eight motorcycles for improving monitoring, water sampling, and meter reading activities, which greatly improved the level of record keeping as well as the motivation of staff.
	Appropriateness of Inputs by South Sudan	How appropriate has the assignment of CP been in terms of the number, placement ownership and level of participation?	• The assignment of C/Ps has been appropriate since manager from each concerned department and HQ were selected as the main C/Ps. As leaders of each department, C/Ps discussed with the JICA Expert Team to plan and implement the Project activities and encouraged their staff to participate in capacity development training. • Despite their regular work responsibilities, C/Ps adequately allocated their time for the Project.
		How appropriate has the provision of facilities and equipment by the South Sudanese side been?	• Office space for the JICA Expert Team and training venues were appropriately provided by the South Sudanese side.
		Has the South Sudanese budget for the Project been appropriate in scale?	• Due to the budget constraints, travel expenses for area stations to attend meetings in monthly meeting with SSUWC HQ and MWRI were not provided. • The Japanese side covered transportation costs and visa administration fees for staff of the Wau and Malakal station, which were originally planned to be covered by the South Sudanese side.
	Cooperation with other organizations/ projects	Has there been any effective cooperation with other organizations or projects that increased the efficiency of the Project?	• The Project effectively cooperated with GIZ and USAID on information sharing and collaboration. The donors including GIZ and USAID meet monthly at the Urban Water Working Group organized by SSUWC HQ. Project officers of GIZ and USAID were invited to seminars in which the Project progress and planned activities were presented. The study report on the existing water supply facilities and services of the Juba and Malakal stations was shared with GIZ, which is in the process of developing a comprehensive database on SSUWC area stations. USAID is currently developing a GIS map compiling customers' information in the Juba station by building on the GIS map of distribution network developed by the Project.
	Contributing or hindering factors to Efficiency	Are there any other factors that increased or decreased the efficiency of the Project?	• There are no other factors that increased or decreased the efficiency of the Project Purposehow.

	Evaluation Questions		Results
	Main Questions	Sub Questions	
Impact	Prospects of achieving the Overall Goals	To what degree has the Overall Goal been achieved?	See Section 1: Project Achievement
	Prospects of achieving the Overall Goals	Will the Overall Goal be achieved in 3 to 5 years after the completion of the Project? (Are the Overall Goal and verifiable indicators still valid?)	• According to the baseline and impact surveys, the customer satisfaction on water supply service of the Juba station has been improved since the beginning of the Project. Since staff of the Juba station have acquired skills to control the turbidity and residual chlorine, it is likely that the water quality will be maintained. The water supply volume is dependent on the provision of power supply. • Capacity of O&M of water supply facilities and financial management has been improved since the outset of the Project. As long as the Juba station can maintain the skills and knowledge of O&M and conduct proper implementation, essential PIs are expected to be further improved. • As far as the Juba station is concerned, assessment of its monthly reports and proper guidance in response are likely to be provided since SSUWC HQ has followed the procedure during the Project period. At the time of the Terminal Evaluation, it is still unclear whether SSUWC HQ are able to assess reports and plans submitted by other area stations since SSUWC HQ has had no opportunity to do it during the Project period.
		Have the Important Assumptions for achieving the Overall Goals been fulfilled?	**Important Assumptions:** (1) Adequate budget of SSUWC is disbursed. (2) The trainees completing the courses do not leave SSUWC. (3) SSUWC HQ starts to extend support to other SSUWC stations as it extends to SSUWC-Juba. • As discussed in the Achievement of the Output above, budget of SSUWC has been greatly reduced and personnel transfer has been occurred quite frequently. • As discussed in the Prospects of achieving the Overall Goals, it is highly likely that SSUWC HQ will provide support to the Juba station according to the reporting system formulated by the Project; however, it is still unclear if SSUWC HQ can provide support to other area stations unless they submit reports since the current support structure is to provide guidance and feedback on the reports submitted by area stations.
	Other aspects	Are there any unexpected positive and negative impacts?	• No unexpected impacts have been identified at the time of the Terminal Evaluation.
Sustainability	Institutional aspect	Have roles and responsibilities of SSUWC-HQ and Juba station have been clearly defined and understood by CP?	• The Project formulated "The Roles of SSUWC Headquarters and Reporting and Planning System" which defined the roles and functions of SSUWC HQ based on the Provisional SSUWC Order. The main functions of SSUWC HQ include, but not limited to, developing guidelines for stations' activities, enforcing rules, and monitoring the performance of stations. • Roles and responsibilities of the Juba station are to operate and manage water supply facilities to provide safe water.
	Organizational aspect	Has an organizational mechanism for continuous capacity development of SSUWC-Juba in its operation and management been established?	• Internal capacity development has been started in each department on a voluntary basis. Managers and core staff of each department acquired an adequate level of O&M methodologies or financial record keeping. In the purification department, the O&M manager is training his staff in daily monitoring, data input and preparation of monthly report. In financial department, while five staff can manage the customer ledger on the digital database, the manager is planning to train all the staff in the department on the newly-established customer database. The managers are going to discuss the plan to organize internal training at the weekly meeting so that training activities are implemented effectively with support and understanding by Area Manager. • There is no internal training system provided for SSUWC area stations.

Evaluation Questions			Results
	Main Questions	Sub Questions	
Sustainability	Financial aspect	Has SSUWC-Juba been able to secure sufficient budget to conduct its operation and management based on the annual plans and O&M manuals developed by the Project?	• Since the Government has suspended the in-kind provision of fuel for generators, the Juba Station has been purchasing the fuel using the revenue from fee collection and operating the water supply facilities according to its revised plan. • The monthly revenue steadily increased from SSP 102,272 in January 2013 to SSP 166,076 in April 2013 as a result of the efficient billing system introduced by the Project and the revised water tariff applied in February 2013 along with the improved water quality. • According to the revenue forecast created by the Project, the Juba Station is estimated to collect monthly revenues of SSP 202,000 and achieve 24 hours of operation by January 2014.
	Technical aspect	Have core staff of SSUWC-Juba been trained sufficiently in number and knowledge to conduct its operation and management based on the annual plans and O&M manuals developed by the Project?	• Core staff in the purification and distribution department has acquired skills and knowledge to conduct its operation and management based on the plans and manuals. Staff of water quality test laboratory are conducting daily, weekly, and monthly test according to the plan. Staff in the financial department manage customer information and payment status using the database developed by the Project. Information regarding the operation status of water supply facilities and location of water leakages has been well recorded since the Project focused on daily inspection of facilities, keeping maintenance record, and understanding the status of operation. • Staff of different department have started to communicate to each other and work together, which have never been observed before the Project. In weekly meetings, each department reports activities that have been carried out in the previous week and shares any problems for discussions. Through regular communications and discussions, staff developed better understanding about activities and challenges of other department.
		Have core staff of SSUWC-Juba acquired sufficient technical skills to be able to maintain, and upgrade or replace when necessary, the equipment provided by the Project?	• Most of the equipment provided by the Project does not require a high level of skill and knowledge to maintain. Further, the JICA Expert Team provided training on maintenance and replacement of equipment. The contact persons and procedures for procuring spareparts and consumables have been organized and presented to responsible staff. • SSUWC HQ and the Juba station need to outsource the repair and maintenance of computers and printers.
	Other factors that will increase or decrease the sustainability of the Project	Are there any other factors that will increase or decrease the sustainability of the Project?	• The Non-Revenue Water Rate of the Juba Station is estimated to be around 50% due to the water leakages from old pipes and unidentified consumers. Although the amount of water supply is expected to increase, the revenue will not increase as expected without taking appropriate measures for the reduction of NRW. • There is a number of unidentified consumers who are not billed from the SSUWC Juba Station.

Annex 5: Training in South Sudan

No.	Activity	1st Term			2nd term			3rd Term			Total		
		No. of participants	No. of sessions	No. of Participants per session	No. of participants	No. of sessions	No. of Participants per session	No. of participants	No. of sessions	No. of Participants per session	No. of participants	No. of sessions	No. of Participants per session
1-1	Analysis and Understanding of the Current Status of O&M of Water Intake and Treatment Facilities	118	14	8							118	14	8
1-2	Collection of O&M Digital Data of Intake Pumping Station and Water Treatment Plant	52	5	10	15	3	5				67	8	8
1-3	Preparation of O&M Plan for Intake Pumping Station and Water Treatment Plant				238	47	5	1	1	1	238	47	5
1-4	Preparation of O&M Manuals for Intake Pumping Station and Water Treatment Plant				56	12	5	27	10	3	56	12	5
2-1	Survey and understanding of the current conditions of water supply service	25	4	6							25	4	6
2-2	Investigation and Understanding of Current Statues of Water Distribution Facilities	22	2	11	10	2	5				32	4	8
2-3	Collection and Compilation of O&M Data of Transmission and Distribution Facilities in Computer				24	4	6	10	5	2	24	4	6
2-4	Preparation of O&M Plan for Transmission and Distribution Facilities				91	19	5	10	5	2	91	19	5
2-5	Preparation of O&M Manuals for Water Transmission and Distribution Facilities				85	15	6	15	5	3	85	15	6
3-1	Preparation of Water Quality Test Plan	40	8	5	5	2	3				45	10	5
3-2	Collection of Digital Data of Water Quality Test Results	59	12	5	179	28	6	55	10	6	238	40	6
4-1	Investigation and Understanding of Current Revenue Collection Conditions	33	9	4				1	1		33	9	4
4-2	Preparation of Digital Customer Ledger Database	43	11	4	1	1	1	2	2	1	44	12	4
4-3	Case Study on Water Tariff and Cost Recovery of Water Utility				5	3	2	25	3	8	5	3	2
4-4	Analysis of Financial Conditions of SSUWC Juba Station				22	15	1	1	1	1	22	15	1
4-5	Recommendations on Improvement of Financial Conditions Including Revenue Collection	6	2	3	5	3	2				11	5	2
4-6	Study on Management Models of Public Water Tap Stands				0						0	0	0
4-7	Study on Management Forms of Water Supply Points for Water Tankers				0						0	0	0
4-8	Study on Tariff Collection from House Connections				12	3	4				12	3	4
5-1	Definition of Roles of SSUWC HQ and SSUWC Juba Station	6	1	6							6	1	6
5-2	Establishing the Rule on Submission of Reports and Plans by SSUWC Stations	21	3	7	5	1	5	8	1	8	26	4	7
5-3	Training on Design and Planning of Water Supply Facilities				22	4	6	52	7	7	22	4	6
5-4	Assistance to Examination of Reports and Plans Submitted by SSUWC Juba Station				9	1	9	23	4	6	9	1	9
5-5	Assistance to SSUWC HQ in Holding Monthly Meeting with Stations and MWRI				9	1	9	3	1	3	9	1	9
5-6	Study on the Existing Water Supply Facilities and Services of 4 Stations by SSUWC HQ				6	1	6				6	1	6
	Regulation of Office Equipments(2/25)	13	1	13							13	1	13
	Computer training (Enplish speaker)	480	40	12							480	40	12
	Computer training (Arabic speaker)	200	20	10							200	20	10
	Weekly Meeting	76	8	10	213	23	9	256	27	9	289	31	9
	JCC	46	2	23	22	1	22	37	1	37	68	3	23
	Progress Seminar	60	1	60							60	1	60
	Rehearsal of Progress Seminar	31	3	10							31	3	10
	Tariff Seminar				37	1	37	25	3	8	37	1	37
Total		1,331	146		1,071	190		551	87		2,402	336	

Annex 6: List of Reports, Manuals, Database and Training Materials

	Product	Type	Year	Details
1	Baseline Survey Report	Report	2011	Current conditions of operation and maintenance for the existing facilities (i.e. intake, transmission, purification and distribution),
2	Report on Current Status of Management Forms of Public Tap Stands	Report	2010	The result of interviews regarding management forms, tariff structure, collection method, actual usage condition for community management, Payam management and private management, and recommendations.
3	Seminar Materials for Understanding of Financial Situation and Introduction of New Water Tariff	Seminar Material	2010	Current financial situation, Cost recovery Revenue Requirement and Tariff rate design, Current situation of water meter installation and customer satisfaction, Simulation of new water tariff
4	Reporting System and Planning System	Manual	2011	Final version of reporting and planning system
5	Water quality monitoring plan	Plan	2011	Water quality monitoring system including water quality standards, parameters, sampling frequency, sampling points and test method
6	Operation and maintenance of Purification plant	Manual	2011	Manuals and standard operation procedure (SOP) for purification plant
7	Operation and maintenance of transmission and distribution facilities	Manual	2011	Manuals and standard operation procedure (SOP) for distribution and transmission facilities
8	Customer and revenue collection database	Database	2011	Software for managing customer database, billing and revenue collection.
9	Management method for public tap and tanker filling points	Manual	2011	Selection procedure of contractors, recording format of collected fees, contract, management manuals
10	Roles of headquarters, reporting and planning system and database of stations	Manual	2011	Roles of headquarters, organization proposed, reporting and planning system and methodology, performance indicators and database of stations
11	Record format for O&M and database for equipment	Format	2011	Comprehensive data and record format of O&M and equipment
12	GIS water distribution network database	Database	2011	Database of distribution network using GIS base map
13	Monthly Reports of Juba station	Report	2011	First format for monthly report in September 2011 and monthly reports were prepared monthly.
14	Monthly reports evaluation formats	Report	2011	Monthly report submission dates, meeting and evaluation dates, and evaluation format
15	Annual Report (2011) and Action Plan (March to June 2012)	Report/Plan	2011	First format for annual report of existing operation and maintenance and annual action plan
16	Annual budget plan (March to June 2012)	Plan	2011	Format of annual budget plan and calculation sheets.
17	Database of SSUWC stations	Database	2011	Database on management, facilities and equipment of Juba, Malakal and Wau stations.
18	Training materials	Training Material	2011	Materials on water intake and treatment facilities, transmission and distribution facilities, water quality management, management model for public tap stands and tanker filling points, outline of planning and designing of water supply facilities
19	Report on Current Status of Management of Water Supply Points for Water Tankers	Report	2011	Positive or negative social and environmental impacts in communities around the water supply points, and management condition of water supply points constructed by USAID (tariff structure, collection method, management form, the average number of usage tankers per day and waiting hours for water supply)

	Product	Type	Year	Details
20	Report on Current Status of Tariff Collection from House Connections	Report	2011	Survey results including the number of contracts showing current condition of house connection, the average number of people using tap per contract, the average consumption water volume, water tariff structure, payment method of water tariff, willingness to pay, reason of outstanding and satisfaction
21	Revised O&M manuals	Manual	2012	Revised manual and standard operation procedures (SOP) for purification, distribution and transmission facilities.
22	Revised monthly report format	Format	2012	Revised monthly report format
23	Water distribution plan and zoning plan	Plan	2012	Plan for pump operation hours for Juba station and pumping stations
24	Water tariff seminar	Training Material	2012	This materials were used for 3 days tariff seminar to understand tariff structure, tariff level, affordability, cost structure and other countries example.
25	Materials for public awareness activities for school students in Juba Station	PR Material	2012	A series of documents was complied to do the public awareness activities for school students in Juba station (activity schedule, song preparation, painting contest, which is drinkable water?, water quiz, Juba station explanation tour)
26	Monthly Reports of Juba station	Report	2012	Revised format for monthly report and monthly reports were prepared monthly.
27	Evaluation of performance indicators	Report	2012	Evaluation results of performance indicators between March and June 2012.
28	Action Plan	Plan	2012	Action Plan from July 2012 to June 2013
29	Annual budget plan	Plan	2012	Annual budget plan and calculation sheets for Juba station from July 2012 to June 2013
30	Evaluation of the Management Model for the Public Tap Stands and Tanker Filling Points	Report	2012	Evaluation and analysis on the suggested management system and logging form and recommendation
31	Report on Ideal Management Form of Water Supply Points for Water Lorries	Report	2012	Recommendation of the management form of water supply points
32	Revised water distribution plan	Plan	2013	Revised water distribution plan with required fuel and expense estimation
33	Revised customer and billing and collection database	Database	2013	Revised software including metered volumetric charge according to new water tariff
34	Report on Analysis of Water Supply Conditions	Report	2013	Status and improvements of the water supply service since the Project started

Annex 7: Project Design Matrix (PDM) version 3

Name of Project: The Project for Management Capacity Enhancement of South Sudan Urban Water Corporation			Period: November 2010 ~ October 2013
Target Area: Juba, South Sudan	Target Group: South Sudan Urban Water Corporation (SSUWC) Headquarter and Juba Station Staff		
Project Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goals:. 1. The quality of the water supply service extended by SSUWC-Juba is improved 2. The management capacity of SSUWC HQ is improved.	1. The customer satisfaction on water supply service of SSUWC-Juba station is enhanced. 2. All essential performance indicators are further improved from the final date of the Project. 3. All reports and plans submitted from area stations are assessed and guidance is given back to them.	1. Baseline and impact survey (household sample interview survey) 2. Monthly and Annual reports 3.1 Evaluation checklist by SSUWC HQ 3.2 Views from the area stations on the support from SSUWC HQ	
Project Objective The management capacity of SSUWC-Juba station is enhanced through capacity development on operation and maintenance of water supply facilities.	1. 80% of 25 essential performance indicators set in the annual plan which are measurable at the SSUWC Juba station is improved compared to the 2011 average. (Essential performance indicators is attached with baseline data of average value in 2011)	1. Monthly and Annual reports	- Adequate budget of SSUWC is disbursed. - The trainees completing the courses do not leave SSUWC. - SSUWC HQ starts to extend support to other SSUWC stations as it extends to SSUWC-Juba.
Output: 1. Capacity of SSUWC-Juba station with respect to operation and maintenance of water intake and treatment facilities is improved.	1-1 Monthly reports and annual reports in which O&M data is compiled. 1-2 Annual plan on water treatment plant. 1-3 The number of staff who acquired adequate O&M skills for WTP increases from 0 to 11 persons. 1-4 Plant average operating hour per day increases from 17.9 hours (2011 average) to 22 hours/day 1-5 The monthly average ratio that the quality of treated water with respect to turbidity is below 5 NTU increases from 90% to 100%. 1-6 The monthly average ratio that the quality of treated water with respect to residual chlorine falls in the range between 0.7 mg/l and 1.2 mg/l increases from 10% to 80 %.	1-1 Confirmation of monthly and annual reports 1-2 Confirmation of annual O&M plan 1-3 Test results (training report) and evaluation by experts 1-4 Monthly and annual reports 1-5 Water quality management report 1-6 Water quality management report	- Any significant damage to water supply facilities is not caused. - Raw water quality is not deteriorated significantly. - Raw water flow is not decreased significantly.
2. Capacity of SSUWC-Juba station with respect to operation and maintenance of water transmission and distribution facilities is improved.	2-1 Monthly reports and annual reports in which O&M data is compiled. 2-2 Annual operation and maintenance plan on O&M of water transmission and distribution facilities. 2-3 The number of staff who acquired adequate O&M skills for transmission and distribution increases from 0 to 10 persons. 2-4 Application of a formulated Pump Operation Plan by the Project is started in 2012.	2-1 Confirmation of monthly and annual reports 2-2 Confirmation of annual O&M plan 2-3 Test results (training report) and evaluation by experts 2-4.1 Pump Operation Plan 2-4.2 Monthly report	

3. Capacity of water quality management of SSUWC-Juba station is improved. 4. Understanding of financial conditions of SSUWC-Juba station is enhanced. 5. Capability of SSUWC HQ to support SSUWC-Juba station is enhanced.	3-1 Water quality management report (monthly and annual) in which water quality monitoring data is compiled. 3-2 The number of staff who acquired adequate water quality test skills increases from 0 persons to 2 persons. 4-1 Revenue collection reports are prepared monthly. 4-2 Recommendations on revenue collection improvement are made. 4-3 Management method of public water tap stands is established. 5-1 SSUWC HQ examines the monthly reports submitted by SSUWC Juba station every other month. 5-2 The number of annual reports and plans that SSUWC HQ examined becomes 2 each. 5-3 The existing water supply facilities and services are inputted in to the established database.	3-1 Confirmation of monthly and annual water quality management report 3-2 Test results (training report) and evaluation by experts 4-1 Confirmation of revenue collection reports 4-2 Annual plan 4-3 Pilot project report on public water tap stand 5-1 Evaluation checklist by SSUWC HQ 5-2 Evaluation meeting minutes 5-3 Confirmation of database	
Activities	Inputs		
1-1 Analysis and understanding of the current status of O&M of water intake and treatment facilities 1-2 Collection and compilation of O&M data of water treatment plant and intake pumping station in computer 1-2-1 Preparation of digital data format using computer 1-2-2 Installation of measuring equipment (flow and pressure) 1-2-3 Measurement of water flow and pressure data and recording O&M data in database 1-2-4 Training on data compilation and analysis 1-2-5 Data compilation and analysis 1-2-6 Preparation of O&M report (monthly, annual) 1-2-7 Discussion on O&M with SSUWC HQ based on O&M report (monthly and annual) 1-3 Preparation of O&M plan for water treatment plant and pumping station (including procurement plan and budget plan) 1-3-1 Setting of goals for improvement, planning for improvement 1-3-2 Training on preparation for O&M plan 1-3-3 Preparation of O&M plan 1-3-4 Discussion on O&M plan with SSUWC HQ based on O&M plan 1-4 Preparation of O&M manuals for water treatment plant and intake water pump 1-4-1 Preparation of manuals 1-4-2 Training on O&M based on prepared manuals 2-1 Survey and understanding of the current conditions of water supply service (Area covered, water pressure, water quality, duration of water supply, residence water difficulties, etc.)	[Japanese side] Human resources: Experts - Chief Advisor/Water Utility Management - Water Treatment Plant Operation and Maintenance - Transmission and Distribution Facilities Operation and Maintenance - Pumping Facilities Operation and Maintenance - Water Quality Management - Financial Evaluation/Water Tariff - Community Development Local staff - Surveyors Training in Japan and other third countries Equipment and materials: - For training ・Flow meters ・Pressure gauges ・Pipes, valves, fittings and miscellaneous ・Plumbing tools set ・Additional water quality analysis equipment ・Projector ・Computers and software ・Printers + consumables ・Copy machine ・Digital camera, video camera ・GPS ・Vehicles	[South Sudan side] Human resources: - Project Director - Project Manager - Project Staff Facilities: - Training rooms - Office for experts Local costs: - Fuel, consumables, etc. - Reagent for water quality analysis - Water meters - Tax exemption Software: - Pipes, valves, fittings and miscellaneous - GIS arcview: 1 set (has been procured by JICA development study) Travel expenses: - Travel expense and allowance for participants of SSUWC stations other than Juba station in training	- The current budget of SSUWC-Juba station is not decreased. - Counterparts do not resign from training course and do not get transferred. - Custom clearance process does not significantly delay import of equipment from overseas. - The power supply condition to water supply facilities is not worsened from the current level. - The roles of SSUWC is not changed. **Pre-conditions:** - The political situation remains stable. - SSUWC continuously manages urban water supply utilities.

2-2 Investigation and understanding of existing facility conditions of transmission and distribution facilities 2-3 Collection and compilation of O&M data of transmission and distribution facilities in computer 2-3-1 Preparation of digital data format using computer 2-3-2 Installation of measuring equipment (flow and pressure) 2-3-3 Measurement of water flow and pressure data and recording O&M data in database 2-3-4 Training on data compilation and analysis 2-3-5 Data compilation and analysis 2-3-6 Preparation of O&M report (monthly, annual) 2-3-7 Discussion on O&M with SSUWC HQ based on O&M report (monthly and annual) 2-4 Preparation of O&M plan for transmission and distribution facilities (including procurement plan and budget plan) 2-4-1 Setting of goals for improvement, planning for improvement 2-4-2 Training on preparation of O&M plan 2-4-3 Preparation of O&M plan 2-4-4 Discussion on O&M plan with SSUWC HQ based on O&M plan 2-5 Preparation of O&M manuals for water transmission and distribution facilities 2-5-1 Preparation of manuals 2-5-2 Training on O&M based on prepared manuals 3-1 Preparation of water quality test plan (location, date, parameters, etc.) 3-2 Collection of digital data of water quality test results 3-2-1 Procurement of additionally required water quality test equipment 3-2-2 Preparation of digital data format using computer 3-2-3 Training on water quality test 3-2-4 Implementation of water quality test 3-2-5 Training on compilation and analysis of water quality test results 3-2-6 Compilation and analysis of water quality test results 3-2-7 Preparation of water quality management report 3-2-8 Discussion on water quality issues with SSUWC HQ based on water quality management report (monthly and annual) 4-1 Investigation and understanding of current revenue collection conditions 4-2 Preparation of digital customer ledger database 4-2-1 Preparation of digital data format using computer	- For administration ・Computers and software Construction of pilot facilities (public water tap stands) Construction of flow meter pit		

4-2-2 Training on data compilation and analysis 4-2-3 Data compilation and analysis 4-2-4 Preparation of report (monthly, annual) 4-2-5 Discussion on revenue collection with SSUWC HQ based on prepared report 4-3 Analysis of financial conditions of SSUWC-Juba station 4-3-1 Analysis of existing cost structure and identification of problems 4-3-2 Estimation of adequate cost based on prepared O&M plans 4-4 Case study on water tariff and cost recovery of water utility 4-5 Recommendations on improvement of financial conditions including revenue collection 4-6 Study on management models of public water tap stand 4-6-1 Investigation and evaluation of existing management system 4-6-2 Community survey for construction of tap stand 4-6-3 Study and selection of efficient management system for new tap stand 4-6-4 Design and construction of public water tap stand 4-6-5 Implementation, evaluation and improvement of management system 4-7 Study on management models of tanker feeding station 4-7-1 Investigation and evaluation of existing management system 4-7-2 Study and selection of efficient management system for tanker feeding station 4-8 Study on tariff collection from house connections 4-8-1 Investigation of current situation 4-8-2 Examination of existing capacity of water meter installation and reading in test field 5-1 Definition of roles of SSUWC HQ and SSUWC-Juba station 5-2 Establishing the rule on submission of reports and plans by SSUWC stations 5-3 Training on design and planning of water supply facilities 5-4 Examination of reports and plans submitted by SSUWC-Juba station 5-5 Assistance to SSUWC HQ in holding monthly meeting with stations and MWRI 5-6 Study on the existing water supply facilities and services of 4 stations by SSUWC HQ			

資料 2　　業務実施機材の譲渡品目リスト

AGREEMENT
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
SOUTHERN SUDAN URBAN WATER CORPORATION
ON
HANDINGOVER OF THE EQUIPMENTS
PROCURED IN THE PROJECT FOR
MANAGEMENT CAPACITY ENHANCEMENT OF
SOUTHERN SUDAN URBAN WATER CORPORATION

The Japan International Cooperation Agency (hereinafter referred to as "JICA") procured various equipments for the Project for "Management Capacity Enhancement of Southern Sudan Urban Water Cooperation" (hereinafter referred to as "the Project") implemented by the Ministry of Water Resource and Irrigation (MoWRI), GoSS and Southern Sudan Urban Water Cooperation (SSUWC).

This is to certify that the equipments on the attached list have been properly handed over from JICA to SSUWC as of 31st March 2011. These equipments have been installed at the required location in SSUWC Headquarters and Juba Station, and will be effectively used and adequately maintained by the staff members in SSUWC for activities of the Project under this agreement.

Juba, 31st March, 2011

Mr. Yasuhiko Wada
Deputy Resident Representative,
Japan International Cooperation Agency
Sudan Office

Eng. Chamjok Chung Wiituor
General Manager,
Southern Sudan Urban Water Cooperation
Government of Southern Sudan

Attachment: List of Equipment Handed Over by JICA

List of Equipment Handed Over by JICA

1. Office Equipment

No.	Item	Quantity	Location of Equipment
1	Projector	1	Administration
2	PC (Desktop)	20	HR, Ledger Keeper(2), Cashier, Store Keeper, Purification, Laboratory, Distribution, Computer Room(10), JICA Expert Room(2)
3	PC (Laptop)	2	Area Manager, General Manager of SSUWC
4	UPS	20	Area Manager, Secretary, HR, Ledger Keeper(2), Cashier, Store Keeper, Purification, Laboratory, Distribution, Computer Room(7), JICA Expert Room(3)
5	AutoCAD LT 2010	1	JICA Expert Room
6	External HDD 0TB	2	Ledger Keeper, JICA Expert Room
7	Hub with 8 channels	4	Computer Room(2), Ledger Keeper, JICA Expert Room
8	LAN cable (5m)	22	Computer Room, Ledger Keeper, JICA Expert Room
9	Printer (A4 laser)	6	Area Manager, Administration, Ledger Keeper, Casher, Distribution, Computer Room
10	Toner (A4 laser)	18	Administration
11	Printer (A4 laser)	6	HR, Accounting, Ledger Keeper, Stock Keeper, Purification, Laboratory
12	Toner (A4 laser)	18	Administration
13	Printer (A3 inkjet)	1	Distribution
14	Ink Cartridge (A3 inkjet)	3	Administration
15	Drum Cartridge	1	JICA Expert Room
16	Photocopy machine table	2	JICA Expert Room
17	USB memory stick	13	HQ's(2), Area Manager, Administration, HR, Accounting, Ledger Keeper, Cashier, Store Keeper, Purification, Laboratory, Distribution, JICA Expert Office
18	Plotter	1	Computer Room
19	Ink Cartridge (Plotter)	3	Computer Room
20	Copy Machine	1	JICA Expert Room
21	Digital Camera	1	Administration
22	Video Camera	1	Administration
23	GPS (Global Positioning System)	1	JICA Expert Room
24	Arc Pad 10	1	JICA Expert Room
25	Book Shelf - close	5	Area Manager, Accounting, Purification, Laboratory, Computer Room
26	Book Shelf - open	7	Administration, HR, Ledger Keeper, Distribution, Library, JICA Expert Room(2)
27	Desk	14	Laboratory, Purification, Computer Room(2), JICA Expert Room(10)
28	Chair	34	Purification(2), Laboratory(2), Computer Room(18), JICA Expert Office(12)
29	Files	60	Storehouse (JICA Expert)
30	Air conditioner	3	Laboratory, JICA Project Office (2)

2. **Equipment for Operation and Maintenance**

No.	Item	Qty	Location of Equipment
1	Tape Measure	1	JICA Expert Room
2	Spade	2	JICA Expert Room
3	Shovel	2	JICA Expert Room
4	Seeling Tape	29	Storehouse (JICA Expert)
5	Steel Pipe	2	Storehouse (JICA Expert)
6	Pressure Gauge Valve	20	Storehouse (JICA Expert)
7	Pressure Gauge	18	JICA Expert Room
8	Metal Case Box	10	JICA Expert Room
9	Extension Cable	1	Storehouse (JICA Expert)
10	Extension Cable	2	Storehouse (JICA Expert)
11	Drainage Pump	1	Storehouse (JICA Expert)
12	Welding Machine	1	Storehouse (JICA Expert)
13	Electrode	1	Storehouse (JICA Expert)
14	Electrode holder	1	Storehouse (JICA Expert)
15	Earth Grip	1	Storehouse (JICA Expert)
16	Welding Cable	2	Storehouse (JICA Expert)
17	Welding Goggles	2	Storehouse (JICA Expert)
18	Welding Globes	2	Storehouse (JICA Expert)
19	Blade for pipe cutting by grinder	10	Storehouse (JICA Expert)
20	Code reel	3	Storehouse (JICA Expert)
21	Slide calipers	3	Storehouse (JICA Expert)
22	Claw Bar	3	Storehouse (JICA Expert)
23	Tapping Machine	1	Storehouse (JICA Expert)
24	Vice	3	Storehouse (JICA Expert)
25	Working Platform	1	Storehouse (JICA Expert)
26	Circuit Tester	1	Storehouse (JICA Expert)
27	Insulation Resistance Tester	1	Storehouse (JICA Expert)
28	Clamp Tester / Meter	1	Storehouse (JICA Expert)
29	Jamper Cable	5	Storehouse (JICA Expert)
30	Rotating Meter	1	Storehouse (JICA Expert)
31	Vibration Gauge	1	Storehouse (JICA Expert)
32	Noise Level Meter	1	Storehouse (JICA Expert)
33	Bar Thermometer	1	Storehouse (JICA Expert)

3. **Equipment,Glassware and Tools for Water Quality Analysis**

No.	Item	Qty	Specification	Location of Equipment
1	Water Conditioning Laboratory	1	CEL / 850	JICA Expert Room
2	Pocket Colorimeter	3	Chlorine Free + Total	Laboratory(1), JICA Expert Office(2)
3	Pocket Colorimeter	1	Iron	Laboratory
4	Pocket Colorimeter	1	Manganese	Laboratory
5	Pocket Colorimeter	1	Ammonia	JICA Expert Room
6	Pocket Colorimeter	1	Nitrate	JICA Expert Room
7	Pocket Colorimeter	1	Fluoride	JICA Expert Room
8	Pocket Colorimeter	1	Dissolved Oxygen	JICA Expert Room
9	Conductivity Starter Kit	1	Conductivity Starter Kit	JICA Expert Room
10	Portable Turbidimeter	1	2100Q	Laboratory

11	Turbidity Color Meter	1	2100AN	Laboratory
12	Still Water Automatic	1	Still Water Automatic	JICA Expert Room
13	Handbook	1	Standard Method	Laboratory
14	Breakers	1	Glass 1000ml, 6/pk	Laboratory
15	Breakers	1	Glass 250ml	Laboratory
16	Flask Erlenmeyer Wide Mouth	1	Glass 250ml	Laboratory
17	Bottle Amber Glass	1	Amber 237ml, 6/pk	Laboratory
18	Bottle Amber Polyethylene	1	Amber 500ml, 6/pk	Laboratory
19	Bottle Amber Polyethylene	1	Amber 1L, 3/pk	Laboratory
20	Cylinder Glass	1	100ml	Laboratory
21	Cylinder Glass	1	250ml	Laboratory
22	Polyethlene Bucket	1	10L handle	Laboratory
23	Sampler Dipper	1	500ml, 12ft handle	Laboratory
24	Jar Tester	1	6 paddle lab stir, 220V, 50Hz	JICA Expert Room

4. Bookand manuals

No.	Title	Quantity	Location of books
1	Water Distribution System Operator Training Handbook; Third Ed. :AWWA	1	Area Manager's Office
2	Water Distribution System Operation and Maintenance: A Field Study Training Program, Fifth Edition : AWWA	1	Area Manager's Office
3	Water Treatment Plant Operation Volume I: AWWA	1	Area Manager's Office
4	Water Treatment Plant Operation Volume II: AWWA	1	Area Manager's Office
5	Water Supply Operations: Textbook Set: AWWA Water Operator Training Textbooks (5 books)	1 set	Area Manager's Office

AGREEMENT
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
SOUTH SUDAN URBAN WATER CORPORATION
ON
HANDINGOVER OF THE EQUIPMENT
PROCURED IN THE PROJECT FOR
MANAGEMENT CAPACITY ENHANCEMENT OF
SOUTH SUDAN URBAN WATER CORPORATION

The Japan International Cooperation Agency (hereinafter referred to as "JICA") procured various equipment for the Project for "Management Capacity Enhancement of South Sudan Urban Water Cooperation" (hereinafter referred to as "the Project") implemented by the Ministry of Water Resource and Irrigation (MoWRI), GOSS and South Sudan Urban Water Cooperation (SSUWC).

This is to certify that the equipment on the attached list have been properly handed over from JICA to SSUWC as of 8th March 2012. These equipment has been installed at the required location in SSUWC Headquarters and Juba Station, and will be effectively used and adequately maintained by the staff members in SSUWC for activities of the Project under this agreement.

8th March 2012

for

Mr. Hirotaka Sato
Chief Advisor,
JICA Project Team

Eng. Eng. Chamjok Chung Wiituor
Managing Director,
South Sudan Urban Water Corporation
Government of South Sudan

1. Equipment for Operation and Maintenance

No.	Description		Quantity	Location
1	Flow meter	Turbine type, 8 inch	5	Already installed
2	Flow meter	Turbine type, 6 inch	1	Already installed
3	Flow meter	Turbine type, 4 inch	1	Already installed
4	Flow meter	Turbine type, 2 inch	1	Already installed
5	PVC Pipe	φ225mm x 5000mm	4 pipes	Already installed
6	PVC Pipe	φ160mm x 5000mm	2 pipes	Already installed
7	Valve	Diameter : 200mm	5	Already installed
8	Valve	Diameter : 150mm	1	Already installed
9	Valve	Diameter : 100mm	1	Already installed
10	Valve	Diameter : 50mm	1	Already installed
11	Flange adaptor	8 inch, Steel X Flange, PN16	4	Already installed
12	Flange adaptor	8 inch, PVC X Flange, PN16	16	Already installed
13	Flange adaptor	6 inch, Steel X Flange, PN16	4	Already installed
14	Flange adaptor	6 inch, PVC X Flange, PN16	4	Already installed
15	Flange adaptor	4 inch, PVC X Flange, PN16	4	Already installed
16	Flange adaptor	2 inch, PE X Flange, PN16	4	Already installed
17	Coupling	6 inch	4	Already installed
18	Coupling	4 inch	8	Already installed
19	Gascket	for 8 inch	20	Already installed
20	Gascket	for 6 inch	4	Already installed
21	Gascket	for 4 inch	4	Already installed
22	Gascket	for 2 inch	4	Already installed
23	Bolts and Nuts	M20	144	Already installed
24	Bolts and Nuts	M16	32	Already installed
25	Washer	for M20	144	Already installed
26	Washer	for M16	32	Already installed

2. Equipment for Water Quality Analysis

No.	Description		Quantity	Location
1	Microscope	Ultra compact handy inverted type (synophthalmia: 10×) (objective : 4×、10×、40×)	1	JICA Expert Room

3. Book and Manuals

No.	Description		Quantity	Location
1	Making Public Enterprises Work: From Despair to Promise: A Turn Around		1 book	JICA Expert Room
2	Water Rates, Fees, and the Legal Environment	2nd Edition	1 book	JICA Expert Room
3	M1 Principles of Water Rates, Fees and Charges	5th Edition	1 book	JICA Expert Room
4	M6 Water Meters-selection, Installation, Testing, and Maintenance	4th Edition	1 book	JICA Expert Room
5	M5 Water Utility Management	2nd Edition	1 book	JICA Expert Room
6	M20 Water Chlorination and Chlorination Practices and Principles	2nd Edition	1 book	JICA Expert Room
7	M22 Sizing Water Service Lines and Meters	2nd Edition	1 book	JICA Expert Room
8	M23 PVC Pipe—Design and Installation	2nd Edition	1 book	JICA Expert Room
9	M37 Operational Control of Coagulation and Filtration Processes	3rd Edition	1 book	JICA Expert Room
10	Teach Yourself VISUALLY Access 2010		1 book	JICA Expert Room

AGREEMENT

BETWEEN

JAPAN INTERNATIONAL COOPERATION AGENCY

AND

SOUTH SUDAN URBAN WATER CORPORATION

ON

HANDINGOVER OF THE EQUIPMENT

PROCURED IN THE PROJECT FOR

MANAGEMENT CAPACITY ENHANCEMENT OF

SOUTH SUDAN URBAN WATER CORPORATION

The Japan International Cooperation Agency (hereinafter referred to as "JICA") procured various equipment for the Project for "Management Capacity Enhancement of South Sudan Urban Water Cooperation" (hereinafter referred to as "the Project") implemented by the Ministry of Water Resource and Irrigation (MoWRI), GOSS and South Sudan Urban Water Cooperation (SSUWC).

This is to certify that the equipment on the attached list have been properly handed over from JICA to SSUWC as of 12th November 2012. These equipment has been installed at the required location in SSUWC Headquarters and Juba Station, and will be effectively used and adequately maintained by the staff members in SSUWC for activities of the Project under this agreement.

12th November 2012

Mr. Hirotaka Sato
Chief Advisor,
JICA Project Team

Eng. Chamjok Chung Wiituor
Managing Director,
South Sudan Urban Water Corporation
Government of South Sudan

Eng. Santurino Tongun
Area Manager
South Sudan Urban Water Corporation
Central Equatoria State (SSUWC-CES)
Government of South Sudan

1. Equipment for Operation and Maintenance

No.	Description		Quantity	
1	Electromagnetic flow meter	ELECTROMAGNET. FLOW METER KROH NE IP57 DIAM.300 230V OBTIFLUX2000	1	P
2		3*1,5mm^2 cable between flowmeter and readout unit	15	m
3		Readout UNIT model C95 from Krohne to be deported at 15 m set in the same control panel that	1	P
4	Turbine flow meter	FLANGED WATER METER WOLTMANN PN 10/16 EPOXY COATED DIAM. 150	3	P
5		FLANGED WATER METER WOLTMANN PN 10/16 EPOXY COATED DIAM. 100	1	P
6	Sluice Valve	CI FLANGED HAND WHEEL GATE VALVE ND 150 CLOCKWISE CL.PN10-16	3	P
7		CI FLANGED HAND WHEEL GATE VALVE ND 100 CLOCKWISE CL.PN10-16	1	P
8	Level Gauge	Water level gauge 1" to be connected on drain pipe of tank model PTD 500 from Krohne outlet 4-20mA to connect a datalogger and read out unit , power 24V	1	P
9		read out unit model C95 from Krohne to be connected to the level gauge	1	P
10		Control panel for read out unit and electronic saving of level via micro SD card	1	P
11		3*1,5mm^2 cable for level gauge, display and datalogger	15	M
12	Chlorine injection by gravity	GRAVITY DOSING SYSTEM OD 25mm scale 10-100L/H	2	P
13	PVC Insert Machine		2	P

2. Equipment for Water Quality Analysis

No.	Description	Quantity	
1	Hydrochloric Acid(HCL) ANALYTICAL, GRADE 2.5L	2	P
2	Sulhuric Acid ANALYTICAL GRADE 2.5L	4	P
3	Sodium thiosulfate	1	P
4	Sodium hydroxide pellets 500g	4	P
5	DPD Free Chlorine Reagent Powder Pillows, 10 mL, pk/100	3	P
6	Alkalinity Reagent Set, Digital Titrator	1	P
7	Dissolved Oxygen AccuVac® Ampules, High Range, pk/25	4	P
8	Nitrogen-Ammonia Reagent Set, Salicylate Method, 10 mL	1	P
9	Nitrogen-Nitrate Reagent Set, LR, 10 mL, Cadmium Reduction	1	P
10	EDTA Digital Titrator Cartridge, 0.0800 M	1	P
11	FerroVer® Iron Reagent Powder Pillows, 10 mL, pk/100	1	P
12	Manganese Reagent Set, LR, PAN, 10 mL	1	P
13	Zinc Reagent Set, Zincon, 20 mL	1	P
14	CuVer® 1 Copper Reagent Powder Pillows, 10 mL, pk/100	1	P

3. Consumable

No.	Description		Quantity	
1	Female Adaptor	brass for HDPE OD 20 threaded 1/2 " BSP with insert	60	P
2		brass for HDPE OD 25 threaded 3/4" BSP with insert	90	P
3		brass for HDPE OD 20 threaded 1 " BSP with insert	30	P
4	Bolts and nuts	for flange DN100 PN16 complet set 8 ZN bolt M16X80mm & 5mm tickness gasket	4	Set
5		for flange DN150 PN16 complet set 8 ZN bolt M20X80mm & 5mm tickness gasket	12	Set
6		for flange DN300 PN10 complet set 12 ZN bolt M20X110mm & 5mm tickness gasket	2	Set
7	Flanged Adaptor	6", OD of PVC 160mm DIN (Pvc Made)	7	nos
8		4"	2	nos
9	Gasket	12"	2	nos
10		6"	10	nos
11		4"	3	nos
12	Coupling	6" -Outer dia of Pvc 160mm DIN	3	nos
13		4"	1	nos
14	Saddle for asbestos (with sockets, rubber ring, bolts & Nuts)	Main pipe: Asbestos 4", Outlet pipe: PE 1/2"	2	nos
15		Main pipe: Asbestos 4", Outlet pipe: PE 3/4"	3	nos
16		Main pipe: Asbestos 4", Outlet pipe: PE 1"	1	nos
17		Main pipe: Asbestos 6", Outlet pipe: PE 1/2"	2	nos
18		Main pipe: Asbestos 6", Outlet pipe: PE 3/4"	3	nos
19		Main pipe: Asbestos 6", Outlet pipe: PE 1"	1	nos
20	Combines ferrulle saddle for Pvc (with sockets, rubber ring, bolts & Nuts)	Main pipe: Pvc 3", Outlet pipe: PE 1/2"	2	nos
21		Main pipe: Pvc 3", Outlet pipe: PE 3/4"	3	nos
22		Main pipe: Pvc 3", Outlet pipe: PE 1"	1	nos
23		Main pipe: Pvc 4", Outlet pipe: PE 1/2"	2	nos
24		Main pipe: Pvc 4", Outlet pipe: PE 3/4"	3	nos
25		Main pipe: Pvc 4", Outlet pipe: PE 1"	1	nos
26		Main pipe: Pvc 6", Outlet pipe: PE 1/2"	2	nos
27		Main pipe: Pvc 6", Outlet pipe: PE 3/4"	3	nos
28		Main pipe: Pvc 6", Outlet pipe: PE 1"	1	nos
29	Ball Valve	1/2"	20	nos
30		3/4"	30	nos
31		1"	10	nos
32	Valve Box	75mm, H =500 -600mm, cover FCD body, Pvc	20	nos
33		75mm, H =700 -900mm, cover FCD body, Pvc	10	nos
34	Elbow for PE Pipes 90 degree	1/2" including in -core 20mm	40	nos
35		3/4" including in -core 25mm	60	nos
36		1" including in -core 32mm	20	nos
37	Male Socket	1/2" 20mm	20	nos
38		3/4" 25mm	30	nos
39		1" 32mm	10	nos
40	Female Sockets	1/2" 20mm	20	nos
41		3/4" 25mm	30	nos
42		1" 32mm	10	nos
43	Sockets	1/2" 20mm	10	nos
44		3/4" 25mm	15	nos
45		1" 32mm	5	nos

AGREEMENT
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
SOUTH SUDAN URBAN WATER CORPORATION
ON
HANDINGOVER OF EQUIPMENT
PROCURED IN THE PROJECT FOR
MANAGEMENT CAPACITY ENHANCEMENT OF
SOUTH SUDAN URBAN WATER CORPORATION
IN FOURTH YEAR TERM

The Project Team of Japan International Cooperation Agency (hereinafter referred to as "JICA") procured the following equipment for the Project of "Management Capacity Enhancement of South Sudan Urban Water Cooperation" (hereinafter referred to as "the Project") implemented by the Ministry of Ministry of Electricity, Dams, Irrigation and Water Resources (MoEDIW), GOSS and South Sudan Urban Water Cooperation (SSUWC).

This is to certify that the equipment has been properly handed over from JICA to SSUWC as of 2nd October 2013. This equipment on the attached list has been utilized for the improvement of communication among SSUWC Juba-station and for operation and maintenance, and will be effectively used and adequately maintained by the staff members in SSUWC for activities of the Project under this agreement.

1st October 2013

JICA PROJECT TEAM
1st Oct
The Project for Management Capacity Enhancement of Southern Sudan Urban Water Corporation

REPUBLIC OF SOUTH SUDAN
SOUTH SUDAN URBAN WATER
01 OCT 2013

for Mr. Hirotaka Sato
Chief Advisor,
JICA Project Team

Eng. Chamjok Chung Wiltuor
Managing Director,
South Sudan Urban Water Corporation
Government of South Sudan

Eng. Hassan Aggrey Yousif
Area Manager
South Sudan Urban Water Corporation
Central Equatoria State (SSUWC-CES)
Government of South Sudan

1. Walkie-Talkie Equipment

No.	Description		Quantity
1	Base Statior	Motorola GM 360 Mobile VHF 136-174MHz Radio, 25W, 255 channels comes with standard mobile accessories VHF Base Radio Supply, VHF base antenna with 30meters RG213 Coaxial cable and connectors	1
2	Radio Terminal	Motorola GP380 VHF 136-174 MHz Handheld Radio, 5W output power, 255 channels, 12.5KHz channel spacing, Includes battery, belt chip, antenna, single unit charger	6
3	Radio Amplifier	Motorola GR500 VHF 136-174 MHz Repeater, 25W output power consists of; * Repeater Housing with power supply * 2×GM340 Radios * 1×RICK * 1×Antenna Duplexer * 1×AC power cord	1

2. Motorcycle

No.	Description		Quantity
1	Motorcycle	SENKE CG 125cc	2

3. Waterproof Equipment

No.	Description	Quantity
1	Waterproof equipment of raw water flow meter	1 set

資料 3　　業務指標（パフォーマンスインディケータ：PI）

1. Production/Purification/Transmission

N	DATA & RATIO	UNIT	Jul	Aug	Sep	Oct	Nov	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13
	Number of days in the month	days/month	31	31	30	31	30	31	31	28	31	30	31	30	31	31	21	31	30	31	31
A	**Characteristic**																				
P1	Raw water pumping design capacity	m3/day	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600	7600
P2	Treatment plant design capacity	m3/day	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200
P3	High lift pumping station design capacity	m3/day	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7200	7600	7600
P4	Treated water tanks	m3	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740	740
P5	Electrical power nominal capacity	kW																			
P6	Required number of bulk meters for internal production	un.	2	2	2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
P7	Existing number of bulk meters for treated water(tw)	un.	1	1	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	5
P8	Working number of bulk meters for treated water(tw)	un.	1	1	1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	5
B	**Operation**																				
P9	Raw water volume	m3/month	185,209	ND	173,550	143,995	180,330	168,597	163,206	127,354	179,021	65,965	130,498	148,404	151,852	139,531	28,220	186,171	185,350	209,919	201,561
P10	Water volume for backwash (estimated) = (100 m3per wash)	m3/month	12,400		12,000	12,400	12,000	12,400	12,400	11,200	12,400	12,000	12,400	12,000	12,400	12,400	8,400	12,400	6,600	5,900	9,000
P11	Water volume for backwash (measured)	m3/month																			
P12	Treated water production volume (estimated)	m3/month	172,809		161,550	131,595	168,330	156,197	150,806	116,154	166,621	53,965	118,098	136,404	139,452	127,131	19,820	173,771	178,750	204,019	192,561
P13	Average daily raw water volume	m3/day	5,974		5,785	4,645	6,011	5,439	5,265	4,548	5,775	2,199	4,210	4,947	4,898	4,501	1,344	6,006	6,178	6,772	6,502
P14	Average daily treated water production volume (estimated)	m3/day	5,561		5,385	4,232	5,611	5,025	4,851	4,175	5,362	1,799	3,796	4,547	4,498	4,101	1,278	5,606	5,958	6,581	6,212
P15	Daily average operation hours of raw water pumping station	hours/day	21	19	19	14	15	13	19.3	16.2	12.8	8.9	19.5	22.0	9.8	19.4	9.6	19.0	19.6	21.4	20.7
P16	Plant average operating hour per day (estimated)	hours/day	18.5	0.0	18.0	14.1	18.7	16.8	16.2	13.9	17.9	6.0	12.7	15.2	15.0	13.7	4.3	18.7	19.9	21.9	20.7
P17	Clear water pumping station average operating hours	hours/day	29.6	24.7	42.0	27.3	26.8	25.1	18.4	11.3	15.3	29.7	12.9	16.2	17.0	12.0	4.7	11.9	7.1	13.1	29.3
P18	Estimated avergae production per hour	m3/hour	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300	300
P19	Power consumption for production	kWh/month																			
P20	Generator fuel	L/month	4,102	4,060	2,210	6,860	4,132	4,000	0	2,300	3,080	800	2,700	940	200	1,300	3,300	1,200	1,300	200	2,100
P21	Generator operating hours per day	hours/day	1.2	2.2	3.6	7.0								ND	6.0	ND	ND	1.6	ND	6.0	2.8
P22	Calculated fuel consumption per hour	L/hour	111.1	60.7	20.3	31.6															
P23	Normal power supply hours per month (estimated)	hours/month	17.3	-2.2	14.3	7.1															
P24	Alum sulfate consumption per month	kg/month	9,300	9,300	9,000	9,300	9,000	9,300	9,300	8,700	9,300	9,300	9,300	9,000	9,600	9,300	3,300	9,300	9,300	9,300	9,300
P25	Chlorine consumption per month	kg/month	720	720	675	697.5	495	675	540	450	675	496	405	495	450	450	135	315	310	270	225
C	**Ratio**																				
P26	Daily average gap between nominal and actual production	m3/day	1,639		1,815	2,968	1,589	2,175	2,349	3,025	1,838	5,401	3,404	2,653	2,702	3,099	5,922	1,594	1,242	619	988
P27	Operating ratio (actual production/design capacity)	%	77%		75%	59%	78%	70%	67%	58%	74%	25%	53%	63%	62%	57%	18%	78%	83%	91%	86%
P28	Operating ratio (actual operation hours/24 hours)	%	77%	0%	75%	59%	78%	70%	67%	58%	74%	25%	53%	63%	62%	57%	18%	78%	83%	91%	86%
P29	Metering ratio (production)	%	33	33	33	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
P30	Water lost by treatment process-Estimated	%	7%		7%	9%	7%	7%	8%	9%	7%	18%	10%	8%	8%	9%	30%	7%	4%	3%	4%
P31	Power consumption	wh/m3																			
P32	Alum sulfate consumption per m3 production	g/m3	53.8		55.7	70.7	53.5	59.5	61.7	74.9	55.8	172.3	78.7	66.0	68.8	73.2	166.5	53.5	52.0	45.6	48.3
P33	Chlorine consumption per m3 production	g/m3	4.17		4.18	5.30	2.94	4.32	3.58	3.87	4.05	9.19	3.43	3.63	3.23	3.54	6.81	1.81	1.73	1.32	1.17
D	**Operation of Hospital and Konyokonyo Pumping Station**																				
Hospital																					
P34	Pump																				
	New pump																				
1	Pump operation hours	hours/month	218	151	158	191	174	257	287	217	38	90	62	94	383	80	ND	ND	40.3	28.3	123.0
2	Average daily pump operation hours	hours/day	7.0	4.9	5.3	6.2	5.8	8.3	9.3	7.8	1.2	3.0	2.0	3.1	12.4	2.6	ND		3.7	0.9	4.0
	Old Pump																				
1	Pump operation hours	hours/month	218	151	158	191	174	257	136	478	8	45	264	120	138	3.4	ND	ND	28.3	64.4	63.0
2	Average daily pump operation hours	hours/day	7.0	4.9	5.3	6.2	5.8	8.3	4.4	17.1	0.3	1.5	8.5	4.0	4.5	3.0	ND		3.1	4.3	8.0
P35	Generator																				
1	Avergae daily generator operation hour	hours/day	0.6	0.7	0.0	1.7	0.4	1.2	1.5	6.8	0.9	2.1	2.0	3.1	4.5	2.6	ND	ND	3.7	2.6	4.0
2	Generator fuel consumption	L/month	840	560	0	1,464	220	1400	1360	700	840	2260	1000	400	145	300	500	ND	300	200	1240
3	Average daily generator fuel consumption	L/day	27.1	18.1	0.0	47.2	7.3	45.2	43.9	25.0	27.1	75.3	32.3	13.3	4.7	9.7	23.8		10.0	6.5	40.0
Konyokonyo																					
P36	Pump																				
1	Pump operation hours	hours/month	56	58	47	21	98	17	31	11	30	71	0	10	27	3	ND	4.6	10.3	20.1	4.9
2	Average daily pump operation hours	hours/day	1.8	1.9	1.6	0.7	3.3	0.5	1.0	0.4	1.0	2.4	0.0	0.3	0.9	0.1	ND	0.1	0.4	0.6	0.2
P37	Generator																				
1	Avergae day generator operation hour	hours/day	0.8	1.5	1.5	0.7	0.8	0.5	1.0	12	0.1	3	0	0.3	6	0.1	ND	4.4	0.6	6	0
2	Generator fuel consumption	L/month	200	400	420	200	349	400	500	600	400	100	0	260	200	140	ND	ND	0	200	300
3	Average day generator fuel consumption	L/day	6.5	12.9	14.0	6.5	11.6	12.9	16.1	21.4	12.9	3.3	0.0	8.7	6.5	4.5				6.5	9.7
E	**Total Fuel Consumption**																				
P38	Total generator fuel consumption	L/month	5,142	5,020	2,630	8,524	4,701	5,800	1,860	3,600	4,320	3,160	3,700	1,600	545	1,740			1,600	600	3,640
P39	Average day generator fuel consumption	L/day	166	162	88	275	157	187	60	129	139	105	119	53	18	0	157.0	5.9	53.3	19.4	117.4

1. Production/Purification/Transmission

N	DATA & RATIO	UNIT	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13
	Number of days in the month	days/month	28	31	30	31	30	31	31
A	**Characteristic**								
P1	Raw water pumping design capacity	m3/day	7600	7600	7600	7600	7600	7600	7600
P2	Treatment plant design capacity	m3/day	7200	7200	7200	7200	7200	7200	7200
P3	High lift pumping station design capacity	m3/day	7600	7200	7200	7200	7200	7200	7200
P4	Treated water tanks	m3	740	740	740	740	740	740	740
P5	Electrical power nominal capacity	kW							
P6	Required number of bulk meters for internal production	un.	6	6	6	6	6	6	6
P7	Existing number of bulk meters for treated water(tw)	un.	5	5	5	5	5	5	5
P8	Working number of bulk meters for treated water(tw)	un.	5	5	5	5	5	5	5
B	**Operation**								
P9	Raw water volume	m3/month	121,196	124,567	126,874	134,047	93,576	85,001	97,611
P10	Water volume for backwash (estimated) = (100 m3per wash)	m3/month	11,200	8,000	7,400	10,400	8,900	10,800	10,200
P11	Water volume for backwash (measured)	m3/month							
P12	Treated water production volume (estimated)	m3/month	109,996	116,567	119,474	123,647	84,676	74,201	87,411
P13	Average daily raw water volume	m3/day	4,328	4,018	4,229	4,324	3,119	2,742	3,149
P14	Average daily treated water production volume (estimated)	m3/day	3,967	3,760	3,982	3,989	2,823	2,394	2,820
P15	Daily average operation hours of raw water pumping station	hours/day	13.7	12.7	16.7	13.4	9.9	10.9	11.9
P16	Plant average operating hour per day (estimated)	hours/day	13.2	12.5	13.3	13.3	9.4	8.7	9.9
P17	Clear water pumping station average operating hours	hours/day	10.0	8.3	6.1	5.9	22.3	5.8	3.1
P18	Estimated avergae production per hour	m3/hour	300	300	300	300	300	209	291
P19	Power consumption for production	kWh/month							
P20	Generator fuel	L/month	10,400	10,400	13,000	17,940	10,220	10,080	10,480
P21	Generator operating hours per day	hours/day	15.4	14.0	1.8	7.6	9.7	10.4	10.9
P22	Calculated fuel consumption per hour	L/hour							
P23	Normal power supply hours per month (estimated)	hours/month							
P24	Alum sulfate consumption per month	kg/month	6,300	4,500	6,300	3,900	3,000	3,900	3,600
P25	Chlorine consumption per month	kg/month	225	270	270	225	225	225	270
C	**Ratio**								
P26	Daily average gap between nominal and actual production	m3/day	3,233	3,440	3,218	3,211	4,377	2,742	2,819
P27	Operating ratio (actual production/design capacity)	%	55%	52%	55%	55%	39%	33%	39%
P28	Operating ratio (actual operation hours/24 hours)	%	55%	52%	55%	55%	39%	36%	41%
P29	Metering ratio (production)	%	100	100	100	100	100	100	100
P30	Water lost by treatment process-Estimated	%	9%	6%	6%	8%	10%	13%	10%
P31	Power consumption	wh/m3							
P32	Alum sulfate consumption per m3 production	g/m3	57.3	38.6	52.7	54.2	41.7	45.2	52.7
P33	Chlorine consumption per m3 production	g/m3	2.05	2.32	2.26	2.18	1.25	1.25	2.32
D	**Operation of Hospital and Konyokonyo Pumping Station**								
Hospital									
P34	Pump								
	New pump								
1	Pump operation hours	hours/month	16.9	33.8	34.0	62.4	48.1	30.5	55.0
2	Average daily pump operation hours	hours/day	0.6	1.1	1.1	2.0	1.6	0.1	0.9
	Old Pump								
1	Pump operation hours	hours/month	89.6	48.2	66.0	57.4	45.1	74.4	40.2
2	Average daily pump operation hours	hours/day	4.3	1.6	2.2	1.9	1.5	2.4	0.7
P35	Generator								
1	Avergae daily generator operation hour	hours/day	0.8	ND	ND	ND	ND	ND	ND
2	Generator fuel consumption	L/month	3150	2100	2,000	3780	1,900	2,020	1,620
3	Average daily generator fuel consumption	L/day	112.5	67.7	66.6	121.9	63.3	65.1	52.3
Konyokonyo									
P36	Pump								
1	Pump operation hours	hours/month	5.0	ND	6.1	10.9	1.7	2.5	2.7
2	Average daily pump operation hours	hours/day	0.2		0.4	0.4	0.1	0.1	0.1
P37	Generator								
1	Avergae day generator operation hour	hours/day	0	ND	0.4	3.1	ND	ND	ND
2	Generator fuel consumption	L/month	0	200	300	740	80	100	0
3	Average day generator fuel consumption	L/day	0.0						
E	**Total Fuel Consumption**								
P38	Total generator fuel consumption	L/month	13,550	12,700	13,000	17,940	12,900	12,200	12,620
P39	Average day generator fuel consumption	L/day	483.9	453.6	433.3	578.7	430.0	393.0	390.2

2. Ditribution Data

			2012						2013							
N	DATA & RATIO	UNIT	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug
A	**DATA**															
D1	Length of distribution network (end of month)	km			71.3	71.7	71.7	71.7	71.7	71.7	71.7	71.7	71.7	71.7	71.7	71.7
D2	Length of network disconnected (D>50mm)	km			0	0	20	0	0	0	0	0	0	0	0	0
D3	Length of network added (D>50mm)	m			192	0	240	0	0	0	0	0	0	0	0	0
D4	Nb of leaks repaired	num			1	0	7	6	8	14	0	0	0	1	15	10
D5	Nb of leaks reported	num			1	14	16	8	4	6	0	0	0	7	19	8
D6	Total repair cost of distribution pipes	SSP														
D7	Total repair cost of house connection pipes	SSP														
B	**RATIO**															
D8	Total Nb.of leaks reported per km of network	num/km			0.01	0.2	0.22	0.11	0.06	0.08	0	0	0	0.1	0	
D9	Nb. of repaired leaks on network per km	num/km														
D10	Nb. of repaired leaks on connection / 1,000 con.	num/1,000c														
D11	% of Nb. of leaks repaired in Nb. of leaks reported	%			100	0	44	75	200	233	#DIV/0!	#DIV/0!	#DIV/0!	14	78.9	1.25
C	**DATA**															
Transmission and Distribution Flow																
D13	**Transmission and distribution from WTP**															
D13.1	To Hospital PS (transmission), 300mm, ACP	m^3/day				1,557	2,576	2,154	2,896	2,760	2,128	744	2,079	2,478	2,343	1,827
D13.2	To Konyokonyo, 200mm, SP	m^3/day				694	777	970	1,081	941	338	No	258	11	99	8
D13.3	To Hospital and TFP, 200mm, ACP	m^3/day				1,639	2,048	1,657	1,460	1,518	1,754	1,308	981	1,923	1,954	1,911
D13.4	To Juba town and Hospital (near main gate), 200mm ACP	m^3/day				179	194	281	197	226	180	85	170	185	219	211
D13.5	Power company	m^3/day			28	17	18	22	30	23	17	6	14	21	17	23
D1.6	**Total transmission and distribution flow from WTP**	**m^3/day**				**4,086**	**5,613**	**5,084**	**5,664**	**5,468**	**4,417**	**2,143**	**3,502**	**4,618**	**4,631**	**3,980**
D14	**Transmission and distribution**															
D14.1	From Hospital New PS to Parliament tank	m^3/day			415	556	553	614	1033	889	419	N/D	350	618	868	685
D14.2	From Hospital old PS to distribution	m^3/day			259	154	N/A	811	942	874	729	239	807	864	531	377
D14.3	From pariament tank to munuki	m^3/day			596	N/A	N/A	N/A	76	53	31	6	283	327	665	
D14.4	From pariament tank to ministry	m^3/day			102	63	N/A	74	28	476	315	65	788	29	104	56
D14.5	From pariament tank to Juba university	m^3/day			100	56	N/A	N/A	12	174	145	52	110	102	263	67
D14.6	From Konyokonyo PS to Kator Tank	m^3/day				70	86	148	198	64	80	N/D	N/D	66	43	3
D14.7	From Kator tank to distribution	m^3/day				114	158	185	254	155	156	N/D	N/D	614	67	65
D	**DATA**															
Days reported of recording work																
D15	Days reported of recording work for water leakage repair, and installation/replacement	days					30	31	9	27	23	22	30	22	28	25
D16	Days reported of recording work for water flow	days							18	24	16	23	22	0	0	25
D17	Days reported of recording work for house connection	days							1	9	7	4	4	7	1	
D18	Days reported of recording work for GPS/GIS	days							24	7	3	1	2	6	5	

3. Water Quality

				2011						2012						2012							2013							
N		DATA & RATIO	UNIT	Jul-11	Aug-11	Sep-11	Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13
A		**Data**																											
Daily Sampling (purification plant)																													
Q1		The number of days of water quality data	number	23	31	30	20	30	20	21	21	22	21	19	20	14	18	19	13	22	19	22	20	20	22	22	13	19	22
Q2		Turbidity in raw water																											
	1	Average turbidity of raw water	NTU	31.1	56.7	45.6	30.5	25.7	11.5	11.3	10.9	14.5	17.2	36.1	54.1	0.7	206.5	32.1	16.2	30.5	15.9	22.2	23.9	31.6	20.5	23.6	19.4	21.3	57.7
	2	Max turbidity of raw water	NTU	84.3	201	121	128	42.6	14	15.8	13	20.1	49.1	48.3	428.5	113	1508.1	81.8	25	116	26.6	30.1	30.3	35.4	80.9	60.2	28.7	58	87.8
	3	Minimum turbidity of raw water	NTU	20.3	29.5	22.3	16.5	14	7.7	8.2	9.2	12.4	10.4	20.4	12.4	21	18	16.7	11.3	11.7	10.1	6.3	14.7	28	9.5	8.9	11.9	10.9	37.1
Q3		Turbidity in clear water																											
	1	Average turbidity of clear water	NTU	3.0	5.9	10.6	4.2	2.9	1.2	0.7	0.5	0.4	0.4	1.4	7.0	1.8	10.6	1.8	1.5	1.8	0.6	0.5	0.5	0.6	1.1	0.7	0.7	1.9	3.6
	2	Max turbidity of clear water	NTU	8.6	11.8	40.0	9.6	10.0	3.4	0.9	0.6	0.5	0.5	5.6	56.0	3.8	77.4	3.9	2.8	5.9	1.5	0.9	1.2	2.0	4.0	2.1	2.7	5.2	5.6
	3	Min turbidity of clear water	NTU	0.2	2	2.3	1.8	0.4	0.1	0.3	0.4	0.2	0	0.4	0.6	0.7	1.8	0.9	0.8	0.3	0.1	0.2	0.2	0	0.1	0	0.2	0	0.5
	4	The number of days of sample within standards	number	19	13	11	15	28	20	21	21	22	21	16	20	14	16	19	13	21	19	22	20	20	20	22	13	95	82
Q4		Resdual chlorine in clear water																											
	1	Average residual chlorine	mg/l	1.0	1.3	1.5	1.1	1	1.1	0.5	0.5	0.6	0.6	0.6	5	0.9	4.5	1.4	1.3	1.2	0.8	0.9	0.8	1.5	1.8	1.8	1.6	1.7	1.8
	2	Max residual chlorine	mg/l	2.2	2.2	2.7	2.2	2.2	3.1	0.9	0.7	0.7	0.7	1.2	36.6	3	31.5	3.6	2.8	2.6	2	2.2	2.1	2.1	2.1	2.1	2	2	2
	3	Minimum residual chlorine	mg/l	0.1	0.02	0.02	0.01	0.5	0.3	0.3	0.4	0.4	0.5	0	0.1	0.1	0.1	0.4	0.04	0.2	0.2	0.3	0.2	0.2	1.5	1.5	1.2	1.2	1.5
	4	The number of days of sample within standards	number	3	4	3	3	20	13	2	4	6	7	6	20	6	8	8	4	5	3	22	20	17	20	21	10	17	22
Q5		Compliance Ratio																											
7	1	Tubidity	%	83%	42%	37%	75%	93%	100%	100%	100%	100%	100%	84%	100%	100%	89%	100%	100%	95%	100%	100%	100%	100%	100%	100%	100%	100%	82%
8	2	Residual chlorine	%	13%	13%	10%	15%	67%	65%	10%	19%	27%	33%	32%	45%	42%	44%	42%	31%	23%	16%	100%	100%	85%	91%	95%	77%	89%	100%
Weekly sampling (tank in the city)																													
Q5		Sampling																											
	1	The total number of sampling days required	number	5	4	5	ND	5	4	0	0	0	0	0	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4
	2	The number of actual sampling days	number	0	1	3	ND	5	3	0	0	0	0	0	1	2	4	3	0	4	3	4	3	4	4	4	1	3	4
1	3	Ratio of actual sampling days to required total weekly sampling days	%	0%	25%	60%	ND	100%	75%	-	-	-	-	-	25%	50%	100%	75%	0%	100%	75%	100%	75%	100%	100%	100%	25%	75%	100%
	4	The number of locations for sampling	number	6	6	6	ND	6	6	0	0	0	0	0	6	7	7	7	7	7	7	7	7	6	6	7	7	7	7
	5	Total number of samples required (days x locations)	number	30	24	30	ND	30	24	0	0	0	0	0	24	28	28	28	35	28	28	28	28	24	24	28	28	28	28
	6	Total number of actual samples	number	0	4	7	ND	12	8	0	0	0	0	0	3	9	10	9	0	18	12	18	12	24	24	24	1	24	24
3	7	Ratio of actual samples to required total weekly samples	%	0%	17%	23%	ND	40%	33%	-	-	-	-	-	13%	32%	36%	32%	0%	64%	43%	64%	50%	100%	100%	100%	100%	100%	100%
Q6		The number of samples of data within standards																						24	24	86	0%	89%	100%
	1	Tubidity	number	ND	3	3	ND	10	8	0	0	0	0	0	3	9	9	8	0	18	12	18	12	24	24	24	1	24	24
	2	Residual chlorine	number	ND	1	2	ND	1	0	0	0	0	0	0	0	3	7	5	0	11	10	18	10	24	24	24	0	24	24
Q7		Compliance Ratio																											
	1	Tubidity	%	ND	75%	43%	ND	83%	100%	-	-	-	-	-	100%	100%	100%	89%	#DIV/0!	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
	2	Residual chlorine	%	ND	25%	29%	ND	8%	0%	-	-	-	-	-	0%	33%	78%	56%	#DIV/0!	61%	83%	100%	83%	100%	100%	100%	0%	100%	100%
Monthly sampling (tap in the city)																													
Q8		Sampling																											
	1	The total number of required days for sampling	number	1	1	1	ND	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	2	The number of actual sampling days	number	1	0	1	ND	1	1	0	0	0	0	0	0	1	1	0	0	0	2	1	1	1	1	1	1	1	1
	3	Total number of samples required (locations)	number	7	7	7	ND	4	4	0	0	0	0	0	0	4	2	4	5	4	4	4	5	6	6	6	6	6	6
	4	The total number of actual samples	number	5		5	ND	4	3	0	0	0	0	0	0	1	6	0	0	0	5	3	1	5	5	5	1	5	5
2	5	Ratio of actual sampling days to required total monthly sampling days	%	100%	0%	100%	ND	100%	100%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	100%	100%	0%	0%	0%	200%	100%	100%	100%	100%	100%	100%	100%	100%
4	6	Ratio of actual samples to required total monthly samples	%	71%	ND	71%	ND	100%	75%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	25%	300%	0%	0%	0%	125%	75%	20%	83%	83%	83%	77%	83%	83%
Q9		The number of samples of data within standards																											
	1	Tubidity	number	5		0		4	3	0	0	0	0	0	0	1	2	0	0	ND	5	3	1	5	5	5	1	1	1
	2	Residual chlorine	number	0	ND	0	ND	0	0	0	0	0	0	0	0	0	0	0	0	ND	5	2	1	5	4	4	0	1	1
Q10		Compliance Ratio																											
	1	Tubidity	%	100%		0%		100%	100%	-	-	-	-	-	-	-		ND	0%	ND	100%	100%	100%	83%	100%	100%	100%	100%	100%
	2	Residual chlorine	%	0%	ND	0%	ND	0%	0%	-	-	-	-	-	-	-		ND	0%	ND	100%	67%	100%	83%	80%	80%	0%	83%	83%
B		**RATIO**																											
D7		Ratio of the number of data of clear water turbidity within standards		83%	42%	37%	75%	93%	100%	100%	100%	100%	100%	84%	100%	100%	100%	100%	100%	95%	100%	100%	100%	100%	100%	100%	100%	100%	82%
D8		Ratio of the number of data of clear water residual chlorine within standards		13%	16%	10%	17%	67%	65%	10%	19%	27%	33%	32%	45%	42%	44%	42%	46%	23%	16%	18%	0%	85%	91%	95%	77%	89%	100%
D9		Ratio of the number of data of tank water turbidity within standards		ND	75%	43%	ND	83%	100%	-	-	-	-	-		64%	20%	89%	0%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
D10		Ratio of the number of data of tank water residual chlorine within standards		ND	25%	29%	ND	8%	0%	-	-	-	-	-		0%	80%	56%	0%	61%	83%	100%	0%	100%	100%	100%	0%	100%	100%
D11		Ratio of the number of data of tap water tubidity within standards		100%	ND	0%	ND	100%	100%	-	-	-	-	-		25%	100%	ND	0%	ND	100%	100%	100%	83%	83%	100%	100%	10000%	100%
D12		Ratio of the number of data of tap water residual chlorine within standards		0%	ND	0%	ND	0%	0%	-	-	-	-	-		0%	0%	ND	0%	ND	100%	67%	0%	83%	83%	80%	0%	83%	83%

ND: No samling

4. Sales, Connections and Customers

N			DATA & RATIO	Data availability	UNIT	Total 2012	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13
A	DATA													
S1	**Population**													
	1	Estimated total population in Juba			inhab.	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000	400,000
	2	Estimated population covered by UWC water												
		1	Domestic connection/Other CU		inhab.	17,896	17,896	17,896	17,896	17,896	17,896	17,896	17,896	17,896
		2	Public tap stand (UWC water)		inhab.	17.316	17,316	17,316	17,316	17,316	17,316	17,316	17,316	17,316
		3	Tankers (UWC water)		inhab.	36,400	36,400	36,400	36,400	36,400	36,400	36,400	36,400	36,400
			Total			**54,313**	**71,612**	**71,612**	**71,612**	**71,612**	**71,612**	**71,612**	**71,612**	**71,612**
	3	Percentage of service population (			%		17.90%	17.90%	17.90%	17.90%	17.90%	17.90%	17.90%	17.90%
S2	Water volume													
	1	Monthly production												
		1	Piped connection (Total - (2+3))											
		2	Public tap stand (Munuki, Kator)											
		3	Tanker filling stations (TFS)											
	2	Estimated Non-Revenue water rat			%		40%	44%	45%	47%	57%	45%	40%	40%
	3	Monthly sold \			m^3/month									
S3	Number of days in period*1													
	1	Domestic customers			days	720	60	60	60	60	60	60	60	60
	2	Other customers (government, co			days	360	30	30	30	30	31	30	31	32
S4	Number of connections (end of the month)													
	1	Domestic			num	3,033	3,043	3,057	3,067	3,069	3,074	3,080	3,090	3,094
	2	Commercial & industrial sector			num	152	153	154	156	157	159	159	160	160
	3	Public sector			num	173	175	175	176	178	179	180	180	181
	4	Public tap stand			num	64	64	64	64	64	64	64	64	64
	5	Tanker filling stations			num	14	14	14	14	14	14	14	14	14
	6	Others			num	129	129	129	129	129	129	129	129	129
		Total			**num**	**3,565**	**3,578**	**3,593**	**3,606**	**3,611**	**3,619**	**3,626**	**3,637**	**3,642**
S5	Number of metered connections													
	1	Domestic			num	46	46	46	46	46	46	46	46	516
	2	Commercial & industrial sector			num	11	11	11	11	11	11	11	11	11
	3	Public sector			num	15	15	15	15	15	15	15	15	15
	4	Public tap stand			num	9	9	9	9	9	9	9	9	9
	5	Tanker filling stations			num	8	8	8	8	8	8	8	8	8
		Total			num	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**89**	**559**
S6	Number of bills delivered													
	1	Domestic			num	2,223	118	277	212	198	398	181	187	224
	2	Commercial & industrial sector			num	207	56	59	46	49	61	32	42	31
	3	Public sector			num	1,008	201	153	129	136	139	67	69	61
	4	Public tap stand			num	54	10	4	3	3	3	3	2	2
	5	Tanker filling stations*2			num	1080	90	90	90	90	90	90	90	90
		Total			**num**	**4,572**	**475**	**583**	**480**	**476**	**691**	**373**	**390**	**408**
S7	Amount of bills delivered													
	1	Domestic			num	885,594	37,310	38,437	41,650	38,420	48,300	28,250	10,390	21,934
	2	Commercial & industrial sector			num	408,275	29,890	49,750	38,450	41,800	91,500	31,400	31,300	30,812
	3	Public sector			num	3,468,047	168,803	179,050	156,900	159,100	184,595	91,200	92,360	99,820
	4	Public tap stand			num	59,577	5,800	8,700	7,958	8,120	4,595	1,800	1,184	2,890
	5	Tanker filling stations*2			num	564,814	40,672	28,937	58,040	83,402	86,320	67,262	88,684	70,675
		Total			**num**	**5,182,320**	**282,475**	**304,874**	**302,998**	**330,842**	**415,310**	**219,912**	**223,918**	**226,131**
S8	Number of bills paid													
	1	Domestic			num	893	59	168	98	83	181	102	109	161
	2	Commercial & industrial sector			num	156	31	38	39	40	53	27	33	23
	3	Public sector			num	410	83	97	42	73	27	21	31	36
	4	Public tap stand			num	50	4	3	2	2	3	2	2	1
	5	Tanker filling stations*2			num	108	90	90	90	90	90	90	90	90
		Total			**num**	**1,550**	**267**	**396**	**271**	**288**	**354**	**242**	**265**	**311**
S9	Amount of bills paid													
	1	Domestic			SSP/perio	119,489	9,042	18,147	14,568	11,120	11,020	12,300	5,629	12,984
	2	Commercial & industrial sector			SSP/perio	183,521	19,090	24,040	24,310	26,056	50,010	20,500	15,905	24,050
	3	Public sector			SSP/perio	238,223	16,500	26,683	11,846	36,154	16,700	19,052	5,576	20,300
	4	Public tap stand			SSP/perio	28,537	1,635	3,813	5,013	6,214	1,020	1,156	712	144
	5	Tanker filling stations*2			SSP/perio	571,630	40,672	28,937	58,038	83,402	86,302	67,262	88,684	70,675
	6	Others			SSP/perio	224158	15,333	15,748	52,207	3,130	6,105	6,340	7,355	7,833
		Total			SSP/perio	**1,365,258**	**102,272**	**117,368**	**165,981**	**166,076**	**171,157**	**126,610**	**123,861**	**136,130**