

Annex 6:

Public Relations Documents

National Water Council 2016



Federal Capital Territory Administration
Federal Capital Territory Water Board
Japan International Cooperation Agency



The Federal Capital Territory Reduction of Non-Revenue Water Project

31st May 2016

Engr. A. A. Nahuiche
Technical Manager, HOD Distribution, FCTWB
Supported by JICA Expert Team

1

Annex6-1

Part-I: Water Supply of FCTWB

3

Contents

Part-I: Water Supply of FCTWB

- 1-1. Introduction
- 1-2. Features
- 1-3. FCTWB Organization and Members involved
- 1-4. Master Plan for Water Supply in the FCC
- 1-5. Water Sources & Water Infrastructure

Part-II: FCTA/FCTWB-JICA Project

- 2-1. Outline of the Project
- 2-2. What is Non-Revenue Water?
- 2-3. Overall Goal, Project Purpose & Outputs
- 2-4. Distribution Monitoring Zones (proposed)
- 2-5. Procedures of Pilot Project
- 2-6. Ongoing Pilot Project Activities (Baseline Analysis)
- 2-7. Training in Japan

2

1-1. Introduction

- The Federal Capital Territory (FCT), Abuja was created in 1976 to serve as the new capital city of the Federal Republic of Nigeria.
- The FCT Water Board (FCTWB) was established in October 1989 to provide potable water of adequate quantity and quality at affordable rate to the residents of the FCT.

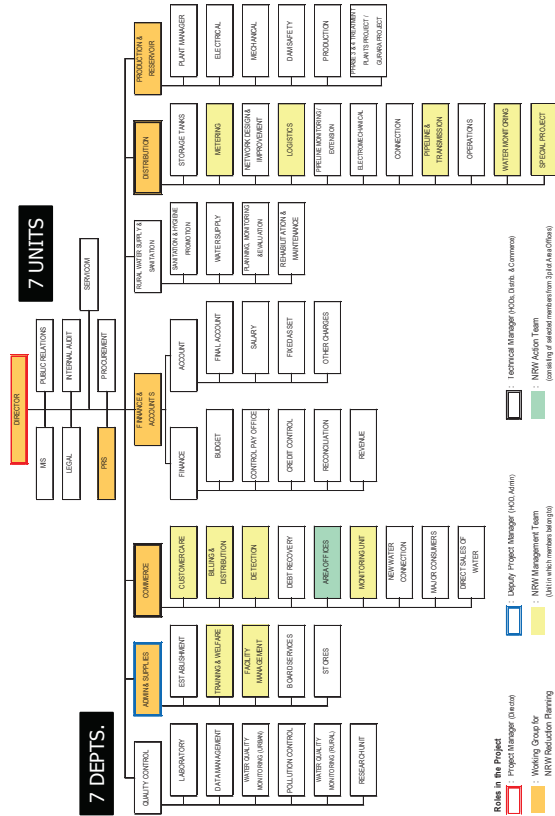
Functions:

- ❖ Management and maintenance of all water works in the FCT
- ❖ Harnessing all water resources of the Territory for economic development.
- ❖ Conducting research for the purpose of carrying out its functions
- ❖ Submission of the findings of the research to the Hon. Minister of the FCT for the purpose of policy formulation

4

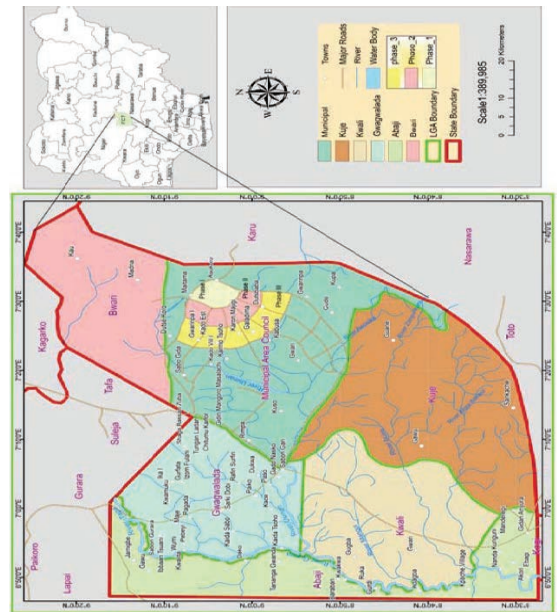
- The water sub-sector of the FCT is well documented under the support infrastructure system of the Master Plan of Abuja.
- The manner in which the water is supplied, distributed, used and disposed off in the FCT properly documented in the Abuja Water supply Master Plan
- The Federal Capital Development Authority (FCDA) Engineering Services Department is responsible for the provision of Water Infrastructure in FCT
- The FCT Water Board (FCTWB) is the Government Agency responsible for the provision of water supply to the residents of FCT

1-3. FCTWB Organization and Members involved

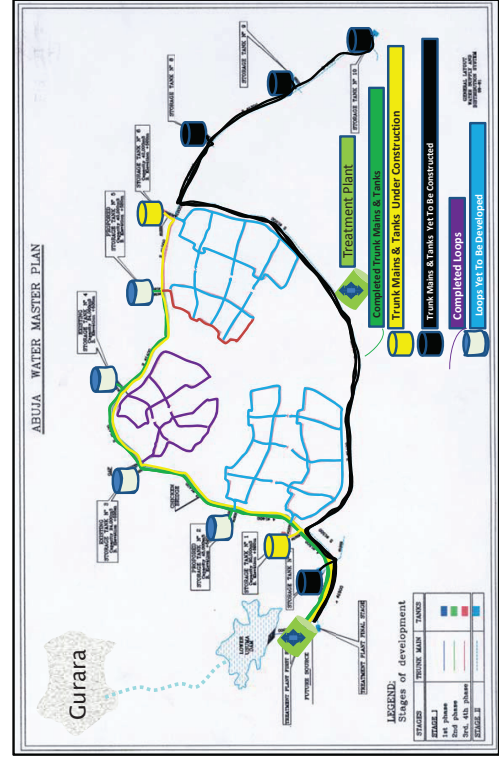


1-2. Features

- National Population 170 million
- FCC population 3 million
- Connections 48,300
- Average actual water product. 274,000m³/day
- Non-Revenue Water (NRW): estimated at 52% of 2014



1-4. Master Plan for Water Supply in the FCC



1-5. Water Sources & Water Infrastructure



- **Lower Usuma Dam**
Capacity: 100 mil. m³
- **Gurara Dam**
Capacity: 880 mil. M³



- **Treatment Plants 1 & 2**
Capacity 10,000m³/hr designed to operate 24hrs a day thus the total output of 240,000m³/day is expected
- **Treatment Plants 3 & 4**
Designed capacity: To provide 20,000m³/hr treated water each boosting treated water supply to 480,000m³/day.

Total Treatment Capacity: 720,000m³/day.

9

Part-II: FCTA/FCTWB-JICA Project

11

2-1. Outline of the Project

- Project Name**
The Federal Capital Territory Reduction of Non-Revenue Water Project
- Project Period**
Phase-1: October 2014 to December 2016 *Ongoing
Phase-2: January 2017 to March 2018
- Project Areas**
Federal Capital Territory (FCT)
Pilot Areas: Garki I, Gudu and Jabi
Nigerian Counterparts
Federal Capital Territory Administration (FCTA)
Federal Capital Territory Water Board (FCTWB)
Japanese Counterparts
JICA Expert Team (based in Abuja)

12

TANK	LOOP	CAPACITY (m ³)	PHASE	STATUS	DISTRICTS SUPPLIED
Tank 1	1	30,000	III	Under construction	Wupa, Karmo, Bunkoro, Nbora, kafe, Gwarimpa I, Gwarimpa II, Dape, Industrial (Area 1)
Tank 2	2	45,000	II	Completed	Jahi, Utako, katampe, Dakibiyu, Kado, Wuye, Mabushi, Kukwaba, Jabi, Recreational park
Tank 3	3	24,000	I	Completed	Maitama, Wuse I and Wuse II
Tank 4	4	24,000	I	Completed	Garki I, Garki II, Asokoro
Tank 5	5	40,000	II	Completed	Durumi, kaura, Gudu, Duboyi, Guzape, Gaduwa, Dutse
Tank 6	6	40,000	III	Under construction	Galadimawa, Dakwo, Lokogoma, Wumba, Saraji, Kabusa, Okanje, Pyakasa, Institutional Are Industrial Area II



Tank 2

10

2-2. What is Non-Revenue Water?

NRW is an **indicator of water supply management and O&M** for actions to be taken, and also is supposed to be **monitored** and kept **lower** to improve **efficiency** of water supply services.

	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
Authorized Consumption	Billed Authorized Consumption	Billed Unmetered Consumption	Revenue Water
	Unbilled Authorized Consumption	Unbilled Metered Consumption	
System Input Volume	Commercial (Apparent) Losses	Unauthorized Consumption	Non-Revenue Water (NRW)
	Water Losses	Customer Metering Inaccuracies and Data Handling Errors	
		Leakage on Transmission and/or Distribution Mains	
		Leakage and Overflows at Utility's Storage Tanks	
	Physical (Real) Losses	Leakage on Service Connections up to Point of Customer Use	

* "Un-accounted for Water (UfW)" is no longer common term.

13

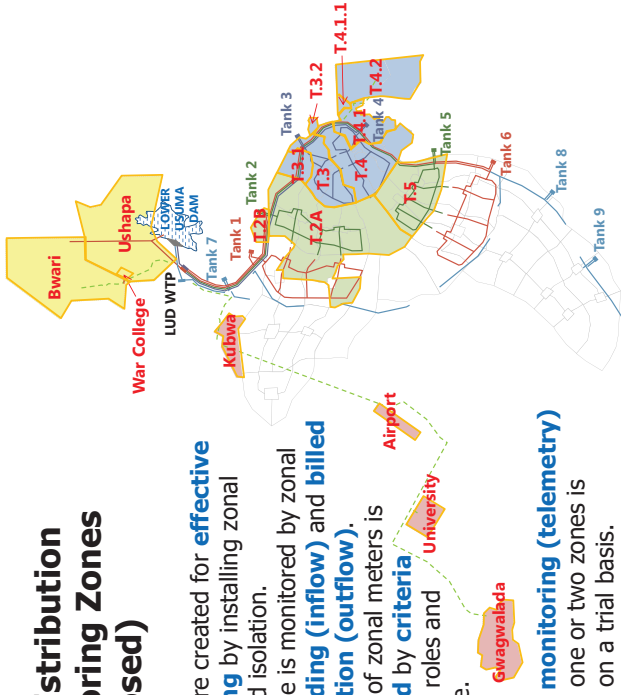
2-3. Overall Goal, Project Purpose & Outputs

Overall Goal	Level of Non-Revenue Water (NRW) is reduced at the service area of FCTWB.
Project Purpose	Capacity of FCTWB for NRW reduction is strengthened.
Output-1	Level of NRW of both the service area of FCTWB and water distribution areas is monitored regularly.
Output-2	Methods/operational procedures for effective NRW reduction are established though pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.
Output-3	A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output 1-2.

14

2-4. Distribution Monitoring Zones (proposed)

- Zones are created for **effective monitoring** by installing zonal meters and isolation.
- Each zone is monitored by zonal meter **reading (inflow)** and **billed consumption (outflow)**.
- Location of zonal meters is **prioritized by criteria** such as its roles and importance.
- **Remote monitoring (telemetry) system** in one or two zones is introduced on a trial basis.



15

2-5. Procedures of Pilot Project of NRW Reduction

Design of PMA/SMA (Pilot Metering Area / Sub-Metering Area)

Creation of PMA/SMA (Installation of Flow Meter & Isolation Valves)

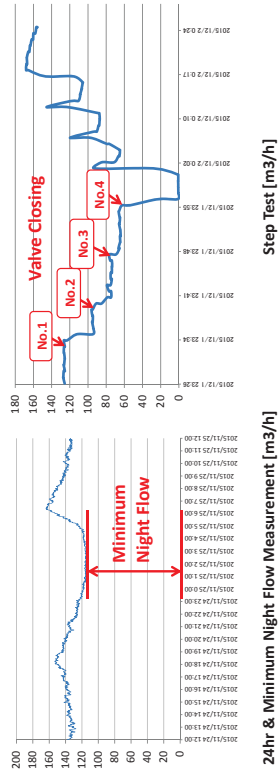
Baseline Analysis of NRW in PMA/SMA (Before)
(24hrs & Minimum Night Flow Measurement, Step Test, Leakage Detection, Customer Meter Reading, Meter Error Test, Identification of Illegal Users...etc.)
In progress

NRW Reduction Operations/Countermeasures
(Leakage Repair, Replacement of Faulty Meters, Conversion from Flat-Rate to Metered, Disconnection/Legalization of Illegal Users, etc.)

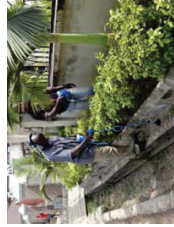
Post Analysis of NRW in PMA/SMA (After)
(24hrs & Minimum Night Flow Measurement, Customer Meter Reading)

16

2-6. Ongoing Pilot Project Activities (Baseline Analysis)



24hrs Flow Measurement by Ultrasonic Flow Meter



Leakage Detection by Ground Microphone



Meter Error Test by Test/Referencing Meter

2-7. Training in Japan



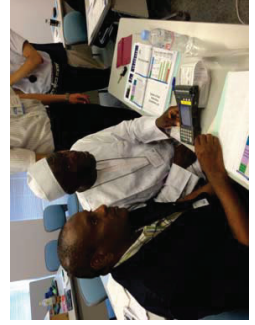
Well-Organized Works with Safety Measures



Leakage Detection Training Yard



Meter Workshop for Accuracy Check



Meter Reading and Billing



01
No. 1
December
2014

Quarterly Newsletter

The Federal Capital Territory Reduction of Non-Revenue Water Project



Contents
Introduction **P.1**
Congratulatory Messages **P.2**
Outline of the Project **P.3**
Project Members **P.4**



Hon. Minister of FCT flags off Reduction of NRW Project in FCT, supported by JICA.

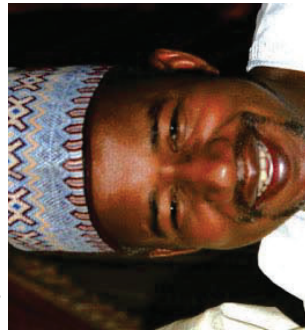
INTRODUCTION

In Abuja, Federal Capital City (FCC), located in the north-east of the Federal Capital Territory (FCT), Federal Republic of Nigeria, water supply facilities have been developed based on water supply master plan prepared in 1980. Although new water treatment plants were recently constructed to meet increasing water demand occasioned by mass-migration and urbanization, distribution facilities such as service reservoir and network have lagged behind in development. On the subject of non-revenue water (NRW) in FCC, the Detail Planning Survey by Japan International Cooperation Agency (JICA) estimated it at 38% in 2014, and the strategic plan for 2011-2015 of the Federal Capital Territory Administration (FCTA) sets its target level at 25%. However, the Federal Capital Territory Water Board (FCTWB) in charge of operation and maintenance has not taken effective actions against NRW because of its shortage of experience, knowledge and qualified personnel on planning and execution of NRW reduction. Improvement in NRW is a key issue in water supply services. Under the circumstance, the Government of the Federal Republic of Nigeria (FRN) requested technical cooperation from the Government of Japan in order to strengthen NRW reduction capacity of

the FCTWB, and then JICA conducted preliminary survey in August 2013 and the Detail Planning Survey in May 2014. Both Governments finally concluded the Record of Discussions (R/D) on 14th July 2014 to implement the **Federal Capital Territory Reduction of Non-Revenue Water Project** (the Project).

The Project launched.

In early November 2014, the launch of the Project was announced officially by JICA and FCTA with FCTWB. Our project office is located inside the headquarters of FCTWB, Area 3, Gariki, Abuja.



Senator Bala Abdulkadir Muhammed
FCT Minister

What is NRW?

According to International Water Association (IWA), "Non-Revenue water (NRW)" is water that has been produced and is "lost" before it reaches the customer. Such losses may be caused through leaking and burst pipes, illegal connections and metering inaccuracies, for example. Reduction of NRW is a key issue to increase revenue and availability of water sources. It is now recommended that "Unaccounted-for Water (UfW)" be no longer used, which is equivalent to "Water Losses" as part of NRW in the Water Balance (or Audit) shown below in O&A, P. 3.

CONGRATULATORY MESSAGES



Mr. Ari, Isa Muhammad
Project Director
Director Economic Planning,
Research and
Statistics (EPRS),
FCTA



The Hon. Minister FCT Senator Bala Abdulkadir Muhammed has officially pronounced the kick-off of the Project.

Making the pronouncement in a tripartite meeting between officials of FCTA-EPRS, FCTWB and JICA, Mr. Ari Isa Mohammed, Director, EPRS, who represented the Hon. Minister explained that the Project is aimed at reducing all forms of water losses in the process of water distribution in order to improve services and increase revenue. Mr. Ari expatiated that the Project will also improve productivity, efficiency, and capacity amongst staff, while the FCTWB in return would be adhering to the principle of global best practices

In his own remarks, Director FCTWB, Malam Hudu Bello reassured that the Hon. Minister is fully committed to the success of the Project and has demonstrated this by promptly approving and releasing the counterpart funding of the Project in order to ensure a hitch free kick-off.

He further reiterated the unalloyed cooperation of management and staff of FCTWB with JICA officials towards the success of the Project.



Mr. Tetsuo Seki
Chief Representative
JICA Nigeria Office



Japan International Cooperation Agency (JICA) is the official arm of the Government of Japan that extends Official Development Assistance (ODA) to developing countries. We have been working in the water sector of Nigeria since 1987 with our first lower Anambra Irrigation Loan Project. Thereafter we supported the Government of Nigeria to prepare the first Water Resources Master Plan in 1995. Supported ten States for the provision of rural water supply; Assisted the strengthening capacity of Rural Water Supply and Sanitation Center at NWRI; Reviewed and Updated Nigeria National Water Resources Master Plan in 2013. With a view to contribute to achievement of Vision 20-2020, we also work in various sectors like Power, Transportation, Agriculture, and Health. The project for FCT reduction of Non-Revenue Water is the first JICA urban water project in Nigeria. It will enhance the capacity of FCTWB to reduce NRW, improve its revenue generation and expand service to other areas. Our principle is based on **"Working Together"** - Inclusive and Dynamic Development. Kindly make maximum use of our proven technology and rich human resources by working together with our Japanese experts. It's our hope that the project will be a "good model" for replication in other states through active participation and collaboration of all stakeholders. Thank you very much.



Mr. Hudu Bello
Project Manager
Director of FCTWB

On behalf of the Management and the entire staff of the FCTWB, we rejoice with our Amiable Hon. Minister of the FCT, the Government of Japan and JICA on the commencement of the Project. We are delighted that the Project will not only boost the capacity of the staff of the FCTWB, but reduce water losses, increase revenue and afford us the extension of our services to wider areas.

It is indeed a thing of joy for us. We welcome the JICA Experts and assure them of our cooperation and synergy.



Mr. Akinori Miyoshi
Chief Advisor
JICA Expert Team

On behalf of the team, I am pleased to offer our congratulations to all counterparts.

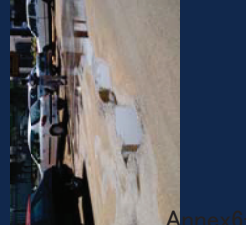
The team consists of members from two Japanese consulting firms, namely, "Yachiyo Engineering Co., Ltd." having a great deal of experience in Nigeria and "Yokohama Water Co., Ltd." affiliated with Yokohama Waterworks Bureau for a megacity in Japan.

I promise the team will fully assist the Nigerian counterparts for a successful project implementation.

Solutions to NRW with Patient Efforts

In the FCT, leakage control including detection of invisible leakage and measures against commercial losses including illegal connections and meter inaccuracy are currently not implemented in systematic way. Just visible leakages are usually repaired on report of consumers, but they are only a small part of the entire leakage.

Through the Project, leakage control and measures against commercial losses will be converted from passive to active manner.



Hydraulic Analysis / GIS

FCTWB has supplied water without adequate hydraulic analysis of distribution networks. But, in response to expansion of the networks and increase in water consumption, hydraulic analysis is necessary in identification of defective pipeline, and then through the pipe replacement, FCTWB can ensure appropriate water supply and pressure. Water pressure is a factor related to leakage.

Information of water supply facilities located in the Phase-1 development area of the FCC has been managed by GIS, but not been utilized adequately. Through update of information of all existing facilities and improvement in skills and knowledge, information-intensive management by GIS and appropriate utilization can contribute to a variety of services.

OUTLINE OF THE PROJECT

Overall Goal

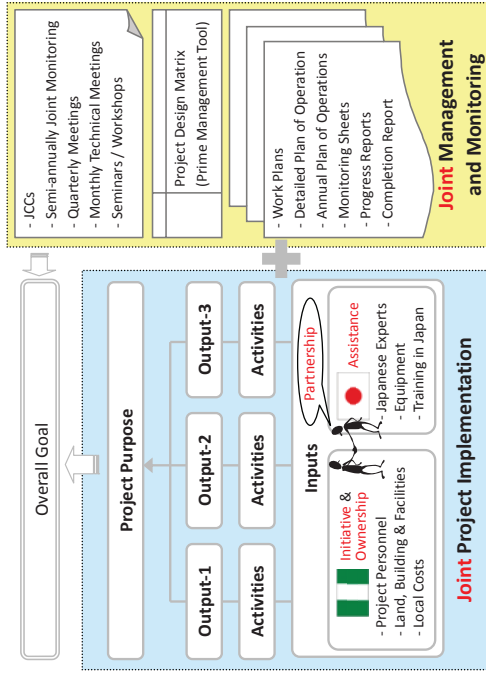
Level of Non-Revenue Water (NRW) is reduced at the service area of FCTWB.

Project Purpose

Capacity of FCTWB for NRW reduction is strengthened.

Outputs

1. Level of NRW of the service area of FCTWB is monitored regularly.
2. Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices
3. A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing Output-1 and -2



Q&A What is Water Balance (or Audit)?

Water balance (or audit) has been developed to understand the big picture of the water system as the first step in reducing NRW.

IWA's Standard Water Balance (or Audit) and Components

Authorized Consumption	Billed Authorized Consumption	Billed Metered Consumption	Revenue Water
Unbilled Authorized Consumption	Unbilled Metered Consumption	Unbilled Unauthorized Consumption	
Commercial (Apparent) Losses	Commercial (Apparent) Losses	Unauthorized Consumption	
Water Losses	Physical (Real) Losses	Customer Metering Inaccuracies and Data Handling Errors	
System Input Volume		Leakage on Transmission and/or Distribution Mains	Non-Revenue Water (NRW)
		Leakage and Overflows at Utility's Storage Tanks	
		Leakage on Service Connections up to Point of Customer Use	

PROJECT MEMBERS

Project Director

Mr. Ari, Isa Muhammad, Director of Economic Planning, Research and Statistics Dept, FCTA

Project Manager

Mr. Hudu Bello, Director of FCTWB

Deputy Project Manager

Mr. S.T. Bello, Head of Administration and Supply Department, FCTWB

Technical Manager (Team Leader of NRW Management Team)

Engr. A. A. Nahuche, Head of Distribution Department, FCTWB
Mr. Adis S. Muhammad, Head of Commerce Department, FCTWB

Head of other relevant Departments and Unit (FCTWB)

Mrs. Hafsat Ahmed Lawi, Head of Finance and Accounts Department
Engr. Aliyu Usman, Head of Reservoir and Production Department
Ms. Bunmi Olowokere, Head of Planning, Research and Statistics Unit
Mr. Abbas A. Ahmed, Head of Public Relations Unit
Mr. Vincent Obbeh, Head of Management Information System Unit

NRW Management Team (FCTWB)

Engr. Abolade, R. Lawal, Head of Special Projects Unit, Coordinator
Engr. Moh. Kabir Rabiu, Head of Logistics Unit
Mr. Musa Dikko, Head of Pipeline Unit
Mr. Shehu Suleiman, Head of GIS Unit
Engr. Douglas E. Oloton, Head of Metering General
Engr. A.O. Akande, Head of Metering Unit (AMR Meter)
Engr. Yetunde Olaniyun, Head of Water Monitoring Unit
Engr. Abullahi Masaud, Head of Metering Unit (Pre-paid Meter)
Mr. Abubakar Ubale Abubakar, Civil Engr. II, Logistics Unit
Mr. Mohammed Dauda, Technical Officer, Pipeline Unit
Mr. Ezech Hilary, Surveyor, GIS Unit
Mr. Isaac O. Owolabi, Head of Customer Care Unit
Mr. Danjuma Isah, Head of Monitoring and Detection Unit
Mr. Taiwo Adeyemi, Monitoring Staff, Monitoring and Detection Unit
Mr. Aliyu Maradun, Head of Major Consumers Unit
Mrs. Rose Akpan, Head of Billing Unit
Mr. Suleman Agbawin, Billing Officer, Billing Unit
Mrs. Francisca Samuel, Head of Training/Welfare Unit
Mr. Akudike Ike D., Head, Facility Management Unit

NRW Action Team (Three Area Offices of FCTWB)

Jabi Area Office

Mr. Muhammad A. S. Ramat, Area Manager (Distribution), Team Leader
Mr. Saadiq Sallihu, Assistant Area Manager (Distribution)
Mrs. Abawonse J. K., Assistant Area Manager (Commerce)
Mrs. Jummai Ugobodaga, Senior Commercial Officer (Commerce)
Mr. Mohammed Moh'd. Planning Officer (Commerce)
Mr. Aliyu Ibrahim, Senior Works Superintendent (Distribution)
Mr. Abubakar Danladi, Foreman (Distribution)
Ms. Rahat Zubairu, Higher Trade Officer (Commerce)
Mr. Mahmud Muhammed, Foreman (Distribution)
Mr. Hassan Yelwa, STA (Commerce)

Gudu Area Office

Mr. Abdurahaman U. Sanda, Area Manager (Distribution), Team Leader
Mr. Ogbu O. Williams, Assistant Area Manager (Commerce)
Mr. Abdul Ozumi, Assistant Area Manager (Distribution)
Mr. Adamu Ismailia, Unit Head (Commerce)
Mr. Umar I. Adamu, Assistant Tech. Officer (Commerce)
Mr. Kontagora Mohammed, Assistant Unit Head (Distribution)
Mr. Salisu Mohammed, Plumber (Distribution)

Ganki I Area Office

Mr. Adesoji Adenuga, Area Manager (Commerce), Team Leader
Mr. Umar Ibrahim, Assistant Area Manager (Commerce)
Mr. Mohammed Gana, Assistant Area Manager (Distribution)
Mrs. Olusegun Rose, Senior Trade Office (Commerce)
Mr. Abdullahi Ibrahim, Assistant Tech. Officer (Commerce)
Mr. Iliya Galadima, Higher Works Super intendant (Distribution)
Mr. Raymond Olowokere, Foreman (Distribution)
Mr. Ibrahim Yelwa, Foreman (Distribution)
Mr. Hassan Abubakar, Commerce Officer (Commerce)
Mr. Shehu Isa, Craftsman (Distribution)

Committee/Group/ Teams in the Project

Joint Coordinating Committee is chaired by Project Director, which consists of Project Managers, representatives from National Planning Commission, Executive Secretary of Federal Capital Development Authority and Federal Ministry of Water Resources, and also JICA Expert Team.

Working Group for NRW

Reduction Planning is a group for the Output-3, development of medium-term strategic plan of NRW reduction, which is composed of Project Managers, NRW Management Team members, and representatives from Federal Capital Development Authority.

NRW Management Team is a team responsible for all activities of the Project with theoretical and practical understandings.

NRW Action Team

NRW Action Team is a working-level team in three pilot areas, responsible for NRW reduction operations with use of equipment.

JICA Expert Team

Mr. Akinori Miyoshi

Chief Advisor /

NRW Reduction Planning

Mr. Taketoshi Fujiyama

Deputy Chief Advisor /

NRW Reduction Planning

Mr. Toru Toyoda

NRW Reduction Operations

Management

Mr. Kiyoshi Kiyama

Leakage Detection Technology

Mr. Takuji Okubo

Commercial Loss

Mr. Shinta Segawa

Hydraulic Analysis / GIS

Mr. Kazuhiro Ishiura

Procurement Management /

Coordinator

Contact

Mr. Hudu Bello, Project Manager

080-5798-7471

Mr. Akinori Miyoshi, Chief Advisor

080-5906-5647

kn-miyoshi@jnti.yachiyo-erj.co.jp



No. 02
July 2015

Quarterly Newsletter

The Federal Capital Territory Reduction of Non-Revenue Water Project



The new Project Director assumes his duties, as well as the new JICA Chief Representative.

Project Name

The Federal Capital Territory Reduction of Non-Revenue Water Project

Project Period

Phase-1: Oct. 2014 to Dec. 2016
Phase-2: Jan. 2017 to Mar. 2018

Project Area

Federal Capital Territory (FCT)
Pilot Areas: Garki I, Gudu and Jabi

Implementation by

FCT Administration (FCTA)
FCT Water Board (FCTWB)

Support by

Japan International Cooperation Agency (JICA)



What is NRW?

According to International Water Association (IWA), "Non-revenue water (NRW) is water that has been produced and is 'lost' before it reaches the customer. Such losses may be caused through leaking and burst pipes, illegal connections and metering inaccuracies, for example. Reduction of NRW is a key issue to increase revenue and availability of water sources. It is now recommended that "Unaccounted-for Water (UfW)" be no longer used, which is equivalent to "Water Losses" as part of NRW in the Water Balance/Audit.

Contents

- Highlights **P.1**
- Major Topics **P.2**
- Scenes of the Project **P.3**
- Project Members **P.4**



The Project is ongoing under the strong partnership between FCTA/FCTWB and JICA.

HIGHLIGHTS

Since the **Federal Capital Territory Reduction of Non-Revenue Water Project** (the Project) was launched officially in November 2014, a variety of activities have been implemented by the Federal Capital Territory Water Board (FCTWB) with support from Japan International Cooperation Agency (JICA).

Estimation of NRW

The Project estimated Non-Revenue Water (NRW) ratio at approximately **40%** in Year 2014, and this can be higher at **52% or more** if existing duplicated/return bills are invalidated or eliminated.

Bulk Flow Meter

Design and bill of quantities of chambers for bulk meters at outlet of Lower Usuma Dam Water Treatment Plant has been finalized.

NRW Reduction Operations

In three pilot Area Offices, namely Jabi, Gudu and Garki I, some Pilot Metering Areas (PMAs) were designed, and then a PMA was selected each for pilot project. In the selected PMAs, the Project will implement NRW reduction operations. Design and bill of quantities of chambers for flow meters and valves has been finalized and network drawings have been prepared.

Capacity Assessment

JICA conducted Capacity Assessment of FCTWB organizationally and individually as baseline, and then prepared Capacity Development Plan which delineates the direction for capacity development in NRW reduction.

Procurement of Equipment

Office equipment and GIS software has already been procured by JICA and handed over to FCTWB. Other items such as ultrasonic flow meters and leakage detection equipment will also be procured by JICA soon.

JCC, Workshop and Meetings

The Project has so far held two Joint Coordinating Committee (JCC) meetings on 2nd December 2014 and 23rd June 2015 respectively. The JCC is a decision-making process and chaired by Project Director, who is also the Director of Economic Planning, Research and Statistics Department, Federal Capital Territory Administration (FCTA). A workshop was also held on 4th December 2014. Quarterly and monthly meetings have regularly been held.

Participation in Trainings in Japan

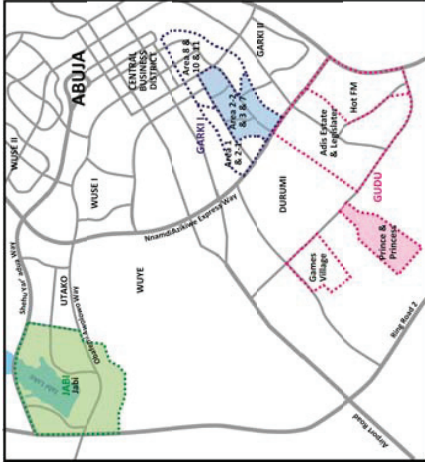
In May and June 2015, three participants from FCTWB, including the Director joined the group training in Japan, which were organized and sponsored by JICA. ¹

MAJOR TOPICS

Estimated NRW Ratio: 40% (52% or more)
Revenue Collection Ratio: 35% (44% or more)

NRW ratio was estimated at 40% by using water production data and billing data of Year 2014, and this can be higher at 52% or more if existing duplicated/return bills are invalidated or eliminated. NRW ratio will be calculated properly only after installation of bulk flow meters at water treatment plant and modification of billing system. In response to duplicated/return bills, which may lead to unreliable financial analysis including NRW and revenue collection ratio, FCTWB will deal with them under the leadership and initiative of FCTWB's management.

NRW Reduction Operations in Preparation:
Active Participation of Area Offices is a Key.



Location of Pilot Metering Areas (PMAs)

- Selected PMAs for NRW Reduction Operations
- "Jabi" under Jabi Area Office (900 customers)
- "Prince&Princess" under Gudu Area Office (1,100 cust.)
- "Area 2-2 & 3 & 7" under Garki I Area Office (1,400 cust.)



PMA/SMA Designing



Network Drawing Preparation



Meter/Valve Location Check

JICA welcomed the Director of FCTWB in Japan.



In May 2015, **Mr. Hudu Bello** (left), the Director of FCTWB and **Mrs. Ololade Y. Okobi** (right), Head of Water Quality Control Department participated in JICA group training course for "Water Supply Administration for Better Management of Water Supply Services" in Tokyo and Yokohama City.

A Feature of FCTWB

Total Bills printed: 48,300
Flat Rate: 7,100 (15%)
Mechanical Meter: 24,600 (51%)
AMR Meter: 11,700 (24%)
Prepaid: 5,000 (10%)

Estimate Bills

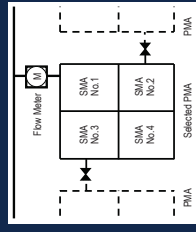
- 11,200 (45%) in Mechanical Meter
- 5,800 (49%) in AMR Meter



What are PMA and SMA?

PMA is an abbreviation of "Pilot Metering Area", in which flow meter is installed at inlet and if necessary at outlet to measure in/outflow to calculate and monitor NRW. Some PMAs are created inside a Pilot Area Office's boundary.

SMA is an abbreviation of "Sub-Metering Area", in which NRW reduction operations such as leakage detection and measures against commercial loss are implemented. Some SMAs are created inside a PMA's boundary.



Editor's Note

Through training courses in Japan, the participants must have learned a lot and extended their knowledge. It is expected that Administration & Supply Dept in charge of human resources development to take the initiative in organizing opportunity of debriefing with other relevant departments for sharing of their knowledge and experiences as well as contribution to success of the Project.

Project Member participated in JICA Training in Japan



In May and June 2015, **Engr. Douglas Oloton**, Head of Metering Unit, Distribution Dept participated in JICA group training course for "Operation and Maintenance of Urban Water Supply System (Water Distribution and Services)" in Osaka City.

His contribution:

-The Training was a wonderful experience as it provided me with advance experiences on O&M using a lot of modern tools and equipment.
 -I unwrapped technically the reasons why we are experiencing high NRW and measures to be taken in order to reduce the NRW such as: Leakage Detection Methods using modern equipment, Technology for Monitoring of Pressure on distribution mains, Pipe line Design Technology, Build-up of Integrated Information Management System, Synergy between the Water Service Provider and other agencies for effective service delivery.
 -Though it is capital intensive and requires adequate planning, record keeping, dedication of staffs of the Board and cooperation of the Government in the area of funding but it is within reach.
 -The training has also exposed me to the Japanese spirit and attitude to work which in fact can be recommended for any organization to emulate for success story.
 -I unswervingly recommend that staff be sent on such trainings to change their psyche and improve their productivity."

SCENES OF THE PROJECT

The Project activities have been implemented with considering capacity development of FCTWB and members on various levels through lectures, interactive discussions, field surveys, on-the-job training (OJT) and so on by JICA Experts.

LECTURES & INTERACTIVE DISCUSSIONS



Presentations and Lectures

- Progress of the Project, Problems and Issues
- PMA/SMA Designing
- Leakage Detection (Leakage Sound, Methodology)
- Commercial Loss
- GIS, and etc.

FIELD SURVEY & ON-THE-JOB TRAINING



Location Check of Chambers for Bulk Flow Meters



Check of Bill of Quantities



Fact Findings about Customer Meters



Sharing Awareness about Complete Network Drawings

PROJECT MEMBERS as of July 2015

Project Director

Mr. Abubakar Sani Pai, Director of Economic Planning, Research and Statistics Dept, FCTA

Project Manager

Mr. Hudu Bello, Director of FCTWB

Deputy Project Manager

Mr. S.T. Bello, Head of Administration and Supply Department, FCTWB

Technical Manager (Team Leader of NRW Management Team)

Engr. A. A. Nahuiche, Head of Distribution Department, FCTWB
 Mr. Adis S. Muhammad, Head of Commerce Department, FCTWB

Head of other relevant Departments and Unit (FCTWB)

Mrs. Hafsat Ahmed Lawi, Head of Finance and Accounts Department
 Engr. Aliyu Usman, Head of Reservoir and Production Department
 Ms. Bunmi Olowookere, Head of Planning, Research and Statistics Unit
 Mr. Abbas A. Ahmed, Head of Public Relations Unit
 Mr. Vincent Obieh, Head of Management Information System Unit

NRW Management Team (FCTWB)

Engr. Abiodun R. Lawal, Head of Special Projects Unit, Coordinator
 Engr. Moh. Kabir Rabiu, Head of Logistics Unit
 Mr. Musa Dikko, Head of Pipeline Unit
 Mr. Shehu Suleiman, Head of GIS Unit
 Engr. Douglas E. Oloton, Head of Metering General
 Engr. A.O. Akande, Head of Metering Unit (AMR Meter)
 Engr. Yetunde Olaniyin, Head of Water Monitoring Unit
 Engr. Abullahi Masaud, Head of Metering Unit (Pre-paid Meter)
 Mr. Abubakar Ubale Abubakar, Civil Engr. II, Logistics Unit
 Mr. Mohammed Dauda, Technical Officer, Pipeline Unit
 Mr. Ezen Hilary, Surveyor, GIS Unit
 Mr. Isaac O. Owolabi, Head of Customer Care Unit
 Mr. Danjuma Isah, Head of Monitoring and Detection Unit
 Mr. Taiwo Adeyemi, Monitoring Staff, Monitoring and Detection Unit
 Mr. Aliyu Maradun, Head of Major Consumers Unit
 Mrs. Rose Akpan, Head of Billing Unit
 Mr. Suleman Agbawin, Billing Officer, Billing Unit
 Mrs. Francisca Samuel, Head of Training/Welfare Unit
 Mr. Akudike Ike D., Head, Facility Management Unit

NRW Action Team (Three Area Offices of FCTWB)

Jabi Area Office
 Mr. Muhammad A. S. Ramat, Area Manager (Distribution), Team Leader
 Mr. Saadiq Sallihu, Assistant Area Manager (Distribution)
 Mrs. Abawonse J. K., Assistant Area Manager (Commerce)
 Mrs. Jummai Ugbodaga, Senior Commercial Officer (Commerce)
 Mr. Mohammed Moh'd. Planning Officer (Commerce)
 Mr. Aliyu Ibrahim, Senior Works Superintendent (Distribution)
 Mr. Abubakar Danladi, Foreman (Distribution)
 Ms. Raihat Zubairu, Higher Trade Officer (Commerce)
 Mr. Mahmud Muhammed, Foreman (Distribution)
 Mr. Hassan Yelwa, STA (Commerce)

Gudu Area Office

Mr. Habib Ahmed Kiru, Area Manager (Distribution), Team Leader
 Mr. Ogbu O. Williams, Assistant Area Manager (Commerce)
 Mr. Abdul Ozumi, Assistant Area Manager (Distribution)
 Mr. Adamu Ismailia, Unit Head (Commerce)
 Umar I. Adamu, Assistant Tech. Officer (Commerce)
 Mr. Kontagora Mohammed, Assistant Unit Head (Distribution)
 Mr. Salisu Mohammed, Plumber (Distribution)

Garki I Area Office

Mr. Adesoji Adenuga, Area Manager (Commerce), Team Leader
 Mr. Choji Pam, Assistant Area Manager (Commerce)
 Mr. Mohammed Gana, Assistant Area Manager (Distribution)
 Mrs. Olusegun Rose, Senior Trade Officer (Commerce)
 Mr. Abdulahi Ibrahim, Assistant Tech. Officer (Commerce)
 Mr. Iliya Galadima, Higher Works Super intendant (Distribution)
 Mr. Raymond Olowookere, Foreman (Distribution)
 Mr. Ibrahim Yelwa, Foreman (Distribution)
 Mr. Hassan Abubakar, Commerce Officer (Commerce)
 Mr. Shehu Isa, Craftsman (Distribution)

Committee/Group/ Teams in the Project

Joint Coordinating Committee is chaired by Project Director, which consists of Project Managers, representatives from National Planning Commission, Executive Secretary of Federal Capital Development Authority and Federal Ministry of Water Resources, and also JICA Expert Team, representatives from JICA Nigeria Office and Embassy of Japan.

Working Group for NRW Reduction Planning is a group for the Output-3, development of medium-term strategic plan of NRW reduction, which is composed of Project Managers, NRW Management Team members, and representatives from Federal Capital Development Authority.

NRW Management Team is a team responsible for all activities of the Project with theoretical and practical understandings.

NRW Action Team is a working-level team in three pilot areas, responsible for NRW reduction operations with use of equipment.

JICA Expert Team

Mr. Akinori Miyoshi
 Chief Advisor /
 NRW Reduction Planning
Mr. Taketoshi Fujiyama
 Deputy Chief Advisor /
 NRW Reduction Planning
Mr. Toru Toyoda
 NRW Reduction Operations Management
Mr. Kiyoshi Kiyama
 Leakage Detection Technology
Mr. Takuji Okubo
 Commercial Loss
Mr. Shinta Segawa
 Hydraulic Analysis / GIS
Mr. Hiroki Nimura
 Procurement Management / Coordinator
Contact
 Mr. Hudu Bello, Project Manager
 080-5788-7471
 Mr. Akinori Miyoshi, Chief Advisor
 080-5906-5647
 kn-miyoshi@jnti.yachiyo-erj.co.jp



03
No.
January
2016

Quarterly Newsletter

The Federal Capital Territory Reduction of Non-Revenue Water Project



Official Handover Ceremony
(FCTWB Director & JICA Chief Representative)

Project Name

The Federal Capital Territory
Reduction of Non-Revenue Water
Project (The Project)

Project Period

Phase-1: Oct. 2014 to Dec. 2016
Phase-2: Jan. 2017 to Mar. 2018

Project Area

Federal Capital Territory (FCT)
Pilot Areas: Gudu, Jabi and Gariki I

Implementation by

FCT Administration (FCTA)
FCT Water Board (FCTWB)

Support by

Japan International Cooperation
Agency (JICA)

JCC, Workshop and Meetings

The Project has so far held three
Joint Coordinating Committee
(JCC) meetings on 2nd Dec. 2014,
23rd Jun. and 12th Nov. 2015. The
JCC is a decision-making process
and chaired by the Project
Director, who is also the Director of
Economic Planning, Research and
Statistics Dept.1, FCTA. A workshop
was also held on 4th December
2014. Quarterly and monthly
meetings have been held regularly.



JICA organized a Stakeholder
Meeting on 10th Nov. 2015, with
Federal Min. of Water Resources,
Kaduna State Water Board and
FCTWB for mutually-beneficial
information sharing.

Contents

- Highlights **P.1**
- Major Topics **P.2**
- Major Topics **P.3**
- Project Members **P.4**

Learnt from Japan & Actions



Welcome, the new FCT Minister and PS.

After the assumption of
duty on 11th Nov. 2015, the
Project welcomes warmly
Mallam Muhammad Musa
Bello, Hon. Minister, FCT
(left) and Dr. Babatope
Ajakaiye, Permanent
Secretary, FCT (right).



HIGHLIGHTS

Pilot Projects commence, and JICA seals Additional Assistance.

Handover of Equipment: Equipment from Japan such as leakage detector and vehicles were procured and then handed over officially from JICA to FCTWB. (See details in page 2.)

GIS Training: Training on GIS for eight FCTWB staff was conducted in Abuja in late November 2015. (See details in page 2.)

Training in Japan: In late August 2015, four project members participated in training course for two weeks in Yokohama City of Japan. (See details in page 3.)

Joint Monitoring: From late October to early November 2015, monitoring evaluation of the Project was conducted jointly by FCTA/FCTWB and JICA in the presence of mission members from JICA Headquarters.

Pilot Projects: The selected three pilot project areas, called Pilot Metering Areas (PMAs), have been created through installation of flow meters and valves. Particularly in Gudu Area, baseline survey prior to Non-Revenue Water (NRW) reduction operations is ongoing. (See details in page 2.)

MAJOR TOPICS

FCTWB is being equipped to implement Pilot Project.

Equipment for implementation of pilot projects were procured and then handed over officially from JICA to FCTWB in the ceremony at FCTWB Headquarters on 3rd Nov. 2015, such as ultrasonic flow meters, data loggers, leakage detectors, correlators, pipe locators, etc. from Japan as well as two 4WD vehicles.



Ultrasonic Flow Meter



Microphone Leak Detector

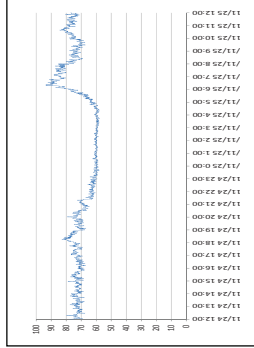
Network drawings as base map for pilot projects in the selected three PMAs have been prepared, and training on GIS for eight FCTWB staff was conducted by a locally-contracted company in Abuja from 23rd Nov. to 1st Dec. 2015.

Findings in Baseline Survey in Pilot Project

Pilot project in a PMA of Gudu Area Office has been implemented, and so far baseline survey is ongoing prior to NRW reduction operations including repair of leakage, replacement of faulty meters and disconnection of illegal connections.

Baseline survey is composed of 24hrs & minimum night flow measurement, step test to prioritize leakage detection, meter inaccuracy/error test, identification of illegal connection, etc.

In the field, project members have faced difficulty in conducting baseline survey, due to inaccessibility to meters located inside property and private storage tanks hindering assumption of leakage by minimum night flow measurement as well as identification of illegal connections



24hrs & Minimum Night Flow Measurement



Meter Inaccuracy/Error Test

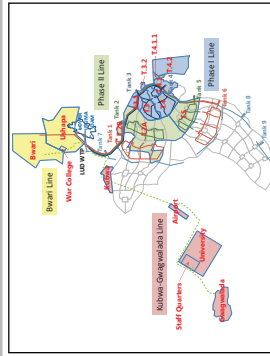


Illegal (Underground Bypassed) Connection

JICA's Additional Assistance under the Project.

Manageable zoning of distribution network enables FCTWB to monitor water distribution and NRW, and carry on maintenance effectively in a large scale of water supply system.

The necessity of additional activities and inputs to the Project, such as installation of zonal meters for water flow monitoring and establishment of framework of water distribution management, was recognized and then accepted as further assistance of JICA.



Proposed Zoning for Water Distribution Management

MEMBER'S VOICE



Mr. Shehu Sulaiman, Head of GIS Unit, Distribution Department, who attended GIS Training together with seven other trainees.

"The training has impacted much by educating staff on the advantage and benefit of using GIS technology with a view to facilitating effective O&M. However, FCTWB should drive skill transfer from trainees to other staff by utilizing GIS software procured by JICA and also sustainability of GIS operations.

It is hoped that JICA will continue to provide comprehensive support including more training in order to ensure not only the perfection of the system but also its sustainability for FCTWB."



Mr. Habib Ahmed Kfiru, Area Manager of Gudu Area Office.

"The Project has enhanced staff's capacity on skills and knowledge of more scientific methodology with procured equipment against NRW, such as 24hrs flow measurement, midnight step test and detection of underground leakages and illegal connections.

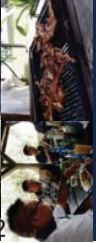
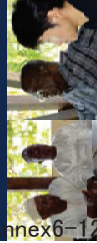
Conclusively, the Project has enlightened us more on the negative effect of NRW and its consequences on the economy. Finally, the Project has to be sustained and extended to cut across all entire system in future for us to meet up with the acceptable level of NRW."

COLUMN



Procurement and installation of photovoltaic system (975kWp) into Lower Usama Water Treatment Plant has been implemented since November 2015 under JICA's project "The Project for Introduction of Clean Energy by Solar Electricity Generation System (Responsible Ministry and implementing agency: the Federal Ministry of Power)" funded by Japan.

This Project will contribute to not only the realization of Nigeria's development plans and energy policy but also alternative power supply to FCTWB as an O&M agency, eventually water supply to more than 40,000 customers.



FCTWB invited JICA Expert Team to weekend lunch one fine day in Nov. 2015 in the waterfront of Lower Usama Dam, which helps both to promote strong ties of friendship.

JICA Expert Team says "We'd like to use this medium to appreciate FCTWB's hospitality."

Congratulations



Mr. Ezech Hilary, a project member, Surveyor of GIS Unit got married on 28th Nov. 2015. The Project offers hearty congratulations to him and his wife.

LEARNT FROM JAPAN AND ACTIONS

In late August 2015, four project members namely Engr. A. A. Nahuche, Mr. Adis S. Muhammad, Engr. Aliyu Usman and Mr. Musa Dikko participated in training course "Water Supply Services Management and NRW Reduction" for two weeks in Yokohama City, Japan (Service Population: 3.7 million, Connection: 1.6 million, Daily Supply: 1.1 million m³, NRW Ratio: 8%).



Award of Certificate by JICA

As a conclusion of the training, they emphasized "Capacity strengthening of FCTWB and service improvement will be achieved by imbibing the practice of being self-sustaining organization as well as applying scientific approaches. Based on knowledge gained from the training, we propose actions to be taken or considered by FCTWB"

Organization

- Enabling Law for FCTWB
- Restructuring the organization for more effective & efficient service delivery
- Preparation of short, medium and long-term planning for training

Planning

- Forming a committee to review ongoing business plan and discuss future plan covering the NRW reduction
- Introduction of quality management of works
- Introduction of information management

Operation and Maintenance

- Creation of the mapping/GIS unit and procedures
- Establishment of leak detection unit
- Strengthening of metering units and establish meter workshop
- Installation of bulk/zonal meters to manage and monitor distribution system
- Introduction of strategic plan for maintenance

Billing

- Review of mode of payment to be more flexible for customers
- Review of water tariff based on volume of water consumption (progressive water tariff)
- Review of billing papers, elimination of return bills

Customer Service

- Enhancement of Customer Service Center and creation of desk officer of each area office
- Creation of more awareness through PR



Well-organized works



Leakage Detection Training Yard



Meter Workshop



Meter Reading and Billing

PROJECT MEMBERS

Project Director
Mr. Abubakar Sani Pai, Director of Economic Planning, Research and Statistics Dept., FCTA

Project Manager
Mr. Hudu Bello, Director of FCTWB

Deputy Project Manager
Mr. S.T. Bello, Head of Administration and Supply Department, FCTWB

Technical Manager (Team Leader of NRW Management Team)
Engr. A. A. Nahuche, Head of Distribution Department, FCTWB

Mr. Adis S. Muhammad, Head of Commerce Department, FCTWB

Head of other relevant Departments and Unit (FCTWB)

Mrs. Hafsat Ahmed Lawi, Head of Finance and Accounts Department
Engr. Aliyu Usman, Head of Reservoir and Production Department
Ms. Bunmi Olowokere, Head of Planning, Research and Statistics Unit
Mr. Abbas A. Ahmed, Head of Public Relations Unit
Mr. Vincent Obek, Head of Management Information System Unit

NRW Management Team (FCTWB)

Engr. Abolade R. Lawal, Head of Special Projects Unit, Coordinator
Engr. Moh. Kabir Babur, Head of Logistics Unit
Mr. Musa Dikko, Head of Pipeline Unit
Mr. Shehu Suleiman, Head of GIS Unit
Engr. Douglas E. Oloton, Head of Metering General
Engr. A.O. Akande, Head of Metering Unit (AMR Meter)
Engr. Yetunde Olaniyun, Head of Water Monitoring Unit
Engr. Abullahi Massaoud, Head of Metering Unit (Pre-paid Meter)
Mr. Abubakar Ubale Abubakar, Civil Engr. II, Logistics Unit
Mr. Mohammed Dauda, Technical Officer, Pipeline Unit
Mr. Ezech Hilary, Surveyor, GIS Unit
Mr. Isaac O. Owolabi, Head of Customer Care Unit
Mr. Danjuma Isah, Head of Monitoring and Detection Unit
Mr. Taiwo Adeyemi, Monitoring Staff, Monitoring and Detection Unit
Mr. Aliyu Maradun, Head of Major Consumers Unit
Mrs. Rose Akpan, Head of Billing Unit
Mr. Suleiman Agbaw, Billing Officer, Billing Unit
Mrs. Francisca Samuel, Head of Training/Welfare Unit
Mr. Akudike Ike D., Head, Facility Management Unit

NRW Action Team (Three Area Offices of FCTWB)

Jabi Area Office

Mr. Mohammed A. S. Ramat, Area Manager (Distribution), Team Leader
Mr. Sadiq Salihu, Assistant Area Manager (Distribution)
Mrs. Abawonse J. K., Assistant Area Manager (Commerce)
Mrs. Jummai Ugbodaga, Senior Commercial Officer (Commerce)
Mr. Mohammed Moh'd. Planning Officer (Commerce)
Mr. Aliyu Ibrahim, Senior Works Superintendent (Distribution)
Mr. Abubakar Danladi, Foreman (Distribution)
Ms. Raihat Zubairu, Higher Trade Officer (Commerce)
Mr. Mahmud Muhammed, Foreman (Distribution)
Mr. Hassan Yelwa, STA (Commerce)

Gudu Area Office

Mr. Habib Ahmed Kiru, Area Manager (Distribution), Team Leader
Mr. Ogbu O. Williams, Assistant Area Manager (Commerce)
Mr. Abdul Ozumi, Assistant Area Manager (Distribution)
Mr. Adamu Ismailia, Unit Head (Commerce)
Mr. Umar I. Adamu, Assistant Tech. Officer (Commerce)
Mr. Kontagora Mohammed, Assistant Unit Head (Distribution)
Mr. Salisu Mohammed, Plumber (Distribution)

Ganki I Area Office

Mr. Adesoji Adenuga, Area Manager (Commerce), Team Leader
Mr. Choji Pam, Assistant Area Manager (Commerce)
Mr. Mohammed Gana, Assistant Area Manager (Distribution)
Mrs. Olusegun Rose, Senior Trade Officer (Commerce)
Mr. Abdulahi Ibrahim, Assistant Tech. Officer (Commerce)
Mr. Iliya Galadima, Higher Works Super intendant (Distribution)
Mr. Raymond Olowokere, Foreman (Distribution)
Mr. Ibrahim Yelwa, Foreman (Distribution)
Mr. Hassan Abubakar, Commerce Officer (Commerce)
Mr. Shehu Isa, Craftsman (Distribution)

JICA Expert Team

Mr. Akinori Miyoshi
Chief Advisor /

NRW Reduction Planning /
Water Distribution Management

Mr. Taketoshi Fujiyama
Deputy Chief Advisor /

NRW Reduction Planning /
Facility Design / Supervision

Mr. Tou Toyoda
NRW Reduction
Management

Mr. Kiyoshi Kiyama
Leakage Detection Technology /
Equipment Design / Installation

Mr. Hiroyuki Morita
Commercial Loss

Mr. Shinta Segawa
Hydraulic Analysis / GIS /
Water Distribution Management

Mr. Seigo Goto
Remote Monitoring

Mr. Hiroki Nimura and
Mr. Takashi Mori
Procurement Management /
Coordinator

Appreciation

The Project expresses utmost thanks to Mrs. Chie Shimodaira, JICA Nigeria Office, leaving Nigeria in the middle of Feb. 2016, for her substantial support to the Project from its commencement.

Chie's Message

"My dear FCTWB Team
It's been really a pleasure to engage the NRW project from its formulation. All the best for your persistent endeavor to enhance the skill, knowledge and commitment to NRW reduction. I will be looking forward to hear about your success story back in Japan.

Chie Shimodaira"

Contact

Mr. Hudu Bello, Project Manager
080-5788-7471

Mr. Akinori Miyoshi, Chief Advisor
080-5906-5647

kn-miyoshi@intl.yachiyo-eng.co.jp

FCT Water Board moves to halt losses

• Thanks Minister, targets higher revenue as Japanese assistance comes



Minister of Federal Capital Territory, Senator Bala Abubakar Mohammed (left) with the Minister of Water Resources, Senator Bala Abubakar Mohammed (right) and other officials inspecting the installation of a large water meter at the Federal Capital Territory Water Board. The Minister of Federal Capital Territory, Senator Bala Abubakar Mohammed, is seen with the Minister of Water Resources, Senator Bala Abubakar Mohammed, and other officials during the inspection of the installation of a large water meter at the Federal Capital Territory Water Board.

By Naji Lawal and Jimoh Oluokan

An innovation to check the perennial wastage of water and take in higher revenue is being introduced by the Federal Capital Territory Water Board.

Bulk meters will soon be in place in various districts. These devices will give details of volume of water supply to districts and hence stemming wastage.

The board's Acting Director, Mallam Hudu Bello disclosed the novel initiative in an interview with Abuja Digest. He said the project is funded by Japanese International Cooperation Agency (JICA) in Abuja.

Installation of the bulk meters, which is part of a water supply project, is being funded by non-water revenues, and assisted by Japan International Cooperation Agency (JICA), is a tripartite arrangement among FCTA, JICA and FCT Water

Board.

According to the Director, records showed that about 50 per cent of water is being lost presently, pointing out that as far-sighted and sensible should be stopped. Miyoshi reiterated the unalloyed cooperation of the expert team to give capacity building to the staff of Water Board as well as provide all the equipment required for the success of the scheme.

He said the Minister demonstrated this by promptly approving and releasing the counterpart funding of the project to ensure hitch-free take-off.

The Director commended the Minister for committing huge resources to provide high quality water for residents of FCT especially against the backdrop of reports by United Nations Children's Fund (UNICEF) that drinking water is responsible for three out of five deaths recorded in Third World countries.

"So, I thank Senator Bala for reducing three out of five deaths expected from drinking water," he said.

Meanwhile, a member of JICA expert team and Chief Adviser on Non-revenue Water Administration, Mr. Akinori Miyoshi, during his presentation on the principles and outline of the project, said a medium-term

FCT Water Board moves to halt losses

Contd from pg 1

Board. It has received the blessings of FCT Minister, Senator (Dr.) Bala Abubakar Mohammed. The project, which has huge potential to reduce water losses, is expected to rake in hefty revenues hitherto lost through burst pipes, leakages, 'overflows', by-passing (a situation where consumers tap water illegally from neighbours without such being accounted for in revenue to Water Board).

Apparently defending the initiative, Mallam Bello explained that it would stop all forms of water losses in the process of water distribution, improve service delivery and increase revenue generation.

Abuja Digest Weekly gathered that the bulk metre aspect of the project is in its pilot stage and would initially be deployed in Jabi, Gudu and Garki I.

Mallam Bello, who also serves as project manager of the scheme, said the innovation involved introduction of bulk metres to various districts in the city which will therefore give details of volume of water supply to the districts and the revenue expected from them so you can see that if wastage is reduced, there would be more water to distribute with more revenue coming in, adding that "The idea of reducing non-revenue water project is to block all forms of water leakages, for reducing three out of five deaths expected from drinking water," he said.

Meanwhile, a member of JICA expert team and Chief Adviser on Non-revenue Water Administration, Mr. Akinori Miyoshi, during his presentation on the principles and outline of the project, said a medium-term

them must have been heavily corroded and through that, we lose huge quantities of water that should be available for human consumption. So, non-revenue water project would stop the loss of water."

According to the Director, records showed that about 50 per cent of water is being lost presently, pointing out that as far-sighted and sensible should be stopped. Miyoshi reiterated the unalloyed cooperation of the expert team to give capacity building to the staff of Water Board as well as provide all the equipment required for the success of the scheme.

He said the Minister demonstrated this by promptly approving and releasing the counterpart funding of the project to ensure hitch-free take-off.

The Director commended the Minister for committing huge resources to provide high quality water for residents of FCT especially against the backdrop of reports by United Nations Children's Fund (UNICEF) that drinking water is responsible for three out of five deaths recorded in Third World countries.

"So, I thank Senator Bala for reducing three out of five deaths expected from drinking water," he said.

Meanwhile, a member of JICA expert team and Chief Adviser on Non-revenue Water Administration, Mr. Akinori Miyoshi, during his presentation on the principles and outline of the project, said a medium-term

Okpongete, FCT Minister, bags prestigious award

By Hauwa Sani

Honour, they say, is given it is due. The persistent he and dedication to duty of Counsel/Secretary, Legal Sec Federal Capital Territory Administration (FCTA) Ima Okpongete has paid off. The Nigerian Bar Association (NBA), Abuja branch (Unit), awarded her the prestigious Res Bar Leader award last week.

The award is in recognition of her successful facilitation of 8000 square metres for the building of the Unity Bar of NBA, "this is a dream fulfilled bet association has been struggling to. The association commended Mohammed for granting them the force to reckon with.

The Abuja branch Bar V superb dinner and award night to

Okpongete, FCT Minister, bags prestigious award

Honour, they say, is given it is due. The persistent he and dedication to duty of Counsel/Secretary, Legal Sec Federal Capital Territory Administration (FCTA) Ima Okpongete has paid off. The Nigerian Bar Association (NBA), Abuja branch (Unit), awarded her the prestigious Res Bar Leader award last week.

The award is in recognition of her successful facilitation of 8000 square metres for the building of the Unity Bar of NBA, "this is a dream fulfilled bet association has been struggling to. The association commended Mohammed for granting them the force to reckon with.

The Abuja branch Bar V superb dinner and award night to

Okpongete, FCT Minister, bags prestigious award

Honour, they say, is given it is due. The persistent he and dedication to duty of Counsel/Secretary, Legal Sec Federal Capital Territory Administration (FCTA) Ima Okpongete has paid off. The Nigerian Bar Association (NBA), Abuja branch (Unit), awarded her the prestigious Res Bar Leader award last week.

The award is in recognition of her successful facilitation of 8000 square metres for the building of the Unity Bar of NBA, "this is a dream fulfilled bet association has been struggling to. The association commended Mohammed for granting them the force to reckon with.

The Abuja branch Bar V superb dinner and award night to

In case of emergency call 112 toll-free

For help on Ebola in FCT call 08032108602 08135651888 080335643975 07032069722 08033196560

Backlog > Doctorate Degree: A testimony of the Minister's exemplary governance—NUJ

If water supply improves appreciably in the nation's capital, the credit must go to the Japan International Cooperation Agency (JICA), which has donated several tools to the local water board. **GBENGA OMOKHUNU reports**



*A representative of the Japanese, Mr. Nakamura agency presenting one of the tools to Mr. Chukwu

A boost for water supply

JICA is aware that the water board currently operates in 16 water service areas in Abuja and has its plans to further expand and serve Abuja residents much better

represent substantial issues of the future investments that are needed for the water supply in the capital city. Mr. Nakamura said the project is a joint effort between the Japanese Agency (JICA) and the local water board, FCTA. The Japanese Agency also donated several tools to the local water board, including flow meters, leak detectors, pipe detectors, test meters, etc. Mr. Nakamura said the project is a joint effort between the Japanese Agency (JICA) and the local water board, FCTA. The Japanese Agency also donated several tools to the local water board, including flow meters, leak detectors, pipe detectors, test meters, etc. Mr. Nakamura said the project is a joint effort between the Japanese Agency (JICA) and the local water board, FCTA. The Japanese Agency also donated several tools to the local water board, including flow meters, leak detectors, pipe detectors, test meters, etc.

Reading made difficult

The British Council building used to have a well-equipped library open to the public. However, the building has been shut down and students have to make do with alternative options. The British Council building used to have a well-equipped library open to the public. However, the building has been shut down and students have to make do with alternative options.

A boost for water supply

Continued from page 25
day, delivery of these equipment and vehicles etc. have noted a worthwhile partnership between the donor and the recipient. We are committed to take good care of the equipment and vehicles. JICA also provides technical assistance to the FCT government since JICA expects to be with you forever and ever." FCT Permanent Secretary, John Chukwu said that the water board project is being implemented with the highest degree of responsibility. He said the project has come on time when emphasis is on prudent conduct of government business. Chukwu who was represented by



*The vehicles donated to FCTA

part to the water board but to the Federal Capital Territory Administration. And government of Nigeria in terms of funding but as it is being witnessed today. JICA also impacted on the development of the skills of the water board officials as the capacity development component of the project. We call on the residents of FCT to support the success of this project by desisting from every form of illegal water connection bills. *Gutter payment of water



FCT has unique role in President's change agenda---Minister

● Alhaji Bello, Perm Sec Dr. Ajakaiye assume duties

By Gomas Uzodinma, Tony Odey and Wisdom Acha

He was one of the first newly-sworn in Ministers to go straightaway from Aso Villa, the seat of power and venue of their inauguration, and report for work. Alhaji Muhammad Musa Bello, the 16th Minister of Federal Capital Territory (FCT), lived up to reputation as a prompt personality who loves to work. He made for Area Eleven where his office is located and

Contd on pg 2

In line with change agenda

FCT Water Board, Japanese agency to rake in millions for govt

By Felix Durumbah

A strategic technical partnership involving Federal Capital Territory (FCT) Water Board and the Japanese International Co-operation Agency (JICA) is being implemented in FCT. The undertaking followed donation of premium technology Japanese equipment which will be employed to reduce the amount of non-revenue water lost through leakages and fittings.

Some of the equipment include ultra-sound water flow meters, leak detectors, pipe detectors, test meters, data loggers as well as two Toyota Hilux vehicles, all worth a conservative N41,000. The equipment are to be deployed to halt huge water revenue leakage lost through various means, and so save these

Contd on pg 7

Backlog

HITTING THE GROUND RUNNING

Contd on pg 11

New FCT Minister, Alhaji Muhammad Musa Bello (left) being welcomed by the new FCTA Permanent Secretary, Dr. Babajide O. Ajakaiye (right) and other senior staff of the Administration during his arrival at the FCTA Secretariat, Area Eleven, Garki on Wednesday.

FCTA kicks off accountability tour of Area Councils

By Anozie Bibian

Service Secretariat (ACSS) has kicked off its accountability tour of all the six Area Councils in the Federal Government to ensure every kobo is accounted for, Federal Capital Territory (FCT) Area Councils

Inspectorate Planning and Monitoring Unit (IPMU) of the ACSS, Architect Joshua Kaura. The exercise is in collaboration with the Office of the Auditor General and Area Councils. This was revealed to *Abuja Digest Weekly* during a briefing by Director,

FCT Water Board, Japanese agency to rake in millions for govt

Contd from pg 1

hefty sums for payment into government treasury.

Observers say the development is coming handy as the mantra of the President Muhammad Buhari administration is more on organizations being creative by adopting means to save cost, maximize output and optimize performance, given the plummeting international prices of crude oil and less inflow into the national till.

Speaking while presenting the equipment to FCT Water Board recently, JICA Chief Representative to Nigeria, Mr. Hirohaka Nakamura recalled that the project kicked off with pilot metering in some places where there exist no functional or reliable system on ground for measuring water losses.

According to him, installing the water flow meters will ensure inflow and outflow are measured.

Nakamura insisted that the biggest efficiency headache of a water firm is water loss or non-revenue water caused by leakages from pipes, illegal connections and under-registration of water meters, resulting in heavy sums being lost.

He added, "In FCT, non-revenue water is a conservative 42 per cent and bill collection efficiency of only 35 per cent," pointing to lack of modern capacity as a cause of the

board's inability. The JICA chief urged officials of Water Board to ensure good care of the equipment, adding that JICA is on hand to give practical training on technology transfer to relevant employees who will handle the tools.

Speaking later, Director, FCT Water Board, Alhaji Hudu Bello, who spoke for a senior official of the Administration, noted that the presentation was coming at a most convenient time "when emphasis is on the prudent conduct of government business."

Expressing appreciation to JICA, Bello said not only would the partnership perk up the board's revenue generation capacity, it would also "impact on the development skills of the Water Board officials as the capacity development component is also implemented."

The director called on FCT residents to support the project's success by "desisting from every form of illegal water connection and through regular payment of water bills."

Goodwill messages came, on the occasion, from directors of key agencies in FCT, with all of them optimistic that, with the fresh injection of capacity, the Water Board will now fulfill its mandate.



Nigeria's widest circulating newspaper

- Kaduna curfew remains
- Govt's revenue down 40%
- Omeruo: I had cramp
- NHIS boss adamant

Displaced Benue farmers back home

Oshiomhole: 90% APC members with me

www.thenationonline.ng

THE NATION

TRUTH IN DEFENCE OF FREEDOM

VOL. 13, NO. 4468 TUESDAY, OCTOBER 23, 2018 N2900.00

FCT board, agency plan N2.5b profit

From Gbenga Omokhunu, Abuja

THE Federal Capital Territory Water Board (FCTWB) is expected to make about N2.5 billion profit if it implements the medium-term plan for the Non-Revenue Water (NRW) reduction project from now till 2021.

Chief Representative, Japan International Cooperation Agency (JICA), Nigeria office, Mr. Katsutoshi Komori made this known yesterday at a seminar organised by FCTWB in conjunction with JICA.

Komori said the NRW reduction is one of the best ways to archive autonomy. He said the collaboration of enhancing FCTWB staff capacity for the reduction of NRW started since October 2014 adding that last September, the project activities were concluded and handed over to FCTWB.

The JICA boss expressed satisfaction with the results achieved at the end of the project. Amongst the outputs, Komori said, includes the reduction of NRW in pilot metering areas like Jabi, Gudu and Garki 1, setting up of operational procedure for effective NRW reduction and the Medium-Term Strategic Plan for the reduction of non-revenue water from 2019 to 2023.

Komori, who was represented by Ms. Makiko Okumura said: "The plan, developed from the pilot activities conducted with FCTWB staff and Japanese experts, as you will learn in detail, lays the necessary actions needed to be taken by FCTWB to ensure NRW is reduced strategically over the next 5 years, through budgetary allocations, appointment of well trained staff for leakage survey and development of pipeline data, amongst other action steps."

"Our project is the first large scale project of NRW reduction in the country and, achieve the reduction of NRW ratio, but when we look over the whole country, Nigeria, State Water Agencies (SWAs) is struggling to reduction of high NRW ratio. We would be happy if other state water agencies engage in knowledge sharing with FCTWB in order to enhance their capacity for reducing NRW in their own territories."

ABUJA DIGEST



Abuja Digest 29th October - 4th November, 2018

Weekly

The Weekly Publication of Federal Capital Territory Administration 177th Edition 29th Oct. - 4th Nov., 2018

FCTA hands over rebuilt Building to UN Pg 2



FCT Perm. Sec. raises Cttee for return of IDP Pg 10



Non-revenue water: Japanese partners task Water Board.. Pg 4



General Manager, FCT Water Board, Engr. A.A Naluche (2nd left) and participants at the JICA/FCTA Non-revenue Water event at Bolton White Hotel, Garki last week.



General Manager, FCT Water Board, Engr. A.A Naluche (2nd right) and participants listening with rapt attention to a presentation at the JICA/FCTA Non-revenue Water event at Bolton White Hotel, Garki last week.

Non-revenue water: Japanese partners task FCT Water Board to rake in N2.5bn revenue by 2021

By Felix Durumbah

Donor partner to Federal Capital Territory Water Board (FCTWB) on non-revenue water (NRW), Japan International Cooperation Agency (JICA) has handed the agency the task of making profit to the tune of N2.5 billion, by 2021—three years from now.

The Japanese agency took the position last week at a closing seminar for the FCT reduction of NRW project, held at Bolton White Hotel, Garki.

Non-revenue water is water which should have been billed for revenue but lost through several causes such as burst pipes, pipe leaks, illegal connections, sundry thefts, and others. The developments have over many years led to the Water Board losing huge fortunes in ascertainable revenue.

However, for years now, JICA has partnered with FCT Administration (FCTA) to introduce specialized hi-tech equipment, vital training, and support services to attempt to stem the trend and move the water agency on the path of profitability.

This was further aided by the recent autonomy granted the agency through an enabling Act of the National Assembly which, among others, seeks to empower the body to control its operations, finances, and so on.

Delivering a keynote address at the event, Chief Representative, JICA, Nigeria Office, Mr. Kazumoshi Komori,

who was represented by Ms. Maki Okumura, said to FCTWB to implement the Medium-Term Strategic Plan (MTSP) for reduction of NRW from 2019-2023.

He said: "Although FCTWB is expected to implement the MTSP under their own responsibility from today, JICA Nigeria will continue to support its implementation in the ways it can.

"We do hope that when we conduct our post-evaluation of this project in 2021, the NRW ratio in Abuja will have been reduced from the large 48.3 per cent to 20 per cent today, and a range of profit from N1 billion or a best case of about N2.5 billion is gained by FCTWB. The NRW reduction is one of the best ways to achieve autonomy."

He recalled that the technical cooperation with FCTWB started in October, 2014, saying that in September this year, the project activities were concluded and handed over to Water Board.

Assessing the extent of work done in NRW so far, the Chief Representative expressed satisfaction achieved at end of the project.

He said: "Amongst the outputs include the reduction of NRW in Jabi (during early 18 months) of JICA funding cycle, the setting up of operational procedures for effective NRW reduction as well as the MTSP."

Komori stated that the project is the first large scale such NRW



Engr. Nahuche (right) and a guest at the event

reduction in Nigeria, stressing that it actually slashed the NRW ratio in FCT.

In a welcome address earlier the Project Director, who doubles as Director, Economic Planning, Research and Statistics (EPRS), FCTA, Malam Sani Pai, represented by a Deputy Director, Mr. Emma Ohi-Okonkwo, thanked management and staff of Water Board for the gathering.

Also showering praises on Japan for its involvement in the project, he stated that the Asian giant "is known for good product, good thinking."

Pai asked Japan to continue to partner with FCTA, despite challenges.

In a goodwill message delivered by his behalf by Engr. Momo Zeleri, Chief Executive, Non-Governmental body WaterAID and K.A. Ali said with the legislation granting autonomy to the agency,

Water Board is being overhauled for commercial, effective and efficient service delivery to FCT residents.

General Manager, FCTWB, Engr. Nahuche, who also spoke, briefly, said implementation of the MTSP was expected to commence from next year, stressing that it will make the agency more sustainable. He called for public support.

Speaking to *Abuja Digest Weekly* on the sidelines of the event, Engr. Nahuche, who was asked by the paper on his expectations for the agency, he hopes for big developments in service delivery, later revenue and so on.

According to him, someday FCTWB will be on the stock market.

He disclosed that some level of roving of staffing had started with the remaining of Director of the agency as General Manager, his lieutenants as Deputy General Managers, and other developments to steer the ship in the proper direction for full service delivery.

The event, where technical presentations were made, drew participants from other states interested in how FCT is reducing NRW. These include Kaduna, Taraba, Oyo, Ondo, as well as the World Bank, JICA, a non-governmental body WaterAID and many others.

Annex 7:

Report on Capacity Assessment
and
Capacity Development Plan



Japan International Cooperation Agency



The Heart of Nigeria

**Federal Capital Territory Administration
Federal Republic of Nigeria**

The Federal Capital Territory Reduction of Non-Revenue Water Project

Capacity Assessment and Capacity Development Plan

Final Report

September 2018

**Federal Capital Territory Water Board
JICA Expert Team**

Federal Republic of Nigeria
The Federal Capital Territory Reduction of Non-Revenue Water Project
Capacity Assessment and Capacity Development Plan (Final Report)

CONTENTS

Introduction

1 Capacity Assessment and Capacity Development Plan at Organizational Level

1.1	Capacity Assessment at Organizational Level	3
(1)	CA Method	3
(2)	Selection of CA Items	3
(3)	Baseline and Result of Capacity Assessment at Organizational Level	4
1.2	Capacity Development Plan at Organizational Level	14
(1)	Capacity Needs of FCTWB	14
(2)	Principles and Capacity Development Plan at Organizational Level	15

2 Capacity Assessment and Capacity Development Plan at Individual Level

2.1	Capacity Assessment at Individual Level	20
(1)	CA Methods	20
(2)	Members assessed (Assesseees)	20
(3)	CA Areas	21
(4)	Results of Capacity Assessment at Individual Level	23
2.2	Capacity Development Plan at Individual Level	27
(1)	Capacity Development Plan at Individual Level	27
(2)	Approaches to achieve Target Capacity	28
(3)	Monitoring and Evaluation of Capacity Development	28

3 Assessment of Institution, Policy and Society Level

(1)	Assessment Method	29
(2)	Selection of Assessment Items	29
(3)	Result of Assessment and Approach by the Project	29

ABBREVIATION

AC	NRW Action on Commerce
AD	NRW Action on Distribution
AFD	Agence Française de Développement
AfDB	African Development Bank
AGIS	Abuja Geographic Information Systems
BT	Basic Tool
CA	Capacity Assessment
CAD	Computer Aided Design
CD	Capacity Development
C/P	Counterpart
DMA	District-Metered Area
EPRS	Economic Planning, Research and Statistics (a Department of FCTA)
FCC	Federal Capital City (Abuja)
FCDA	Federal Capital Development Agency
FCT	Federal Capital Territory
FCTA	Federal Capital Territory Administration
FCTWB	Federal Capital Territory Water Board
FI	Facility Investment
FMWR	Federal Ministry of Water Resources
GIS	Geographical Information System
GPS	Global Positioning System
HA	Hydraulic Analysis
HOD	Head of Department
HOU	Head of Unit
HQ	Headquarters
HRD	Human Resource Development
IDP	International Development Partner
IWA	International Water Association
JICA	Japan International Cooperation Agency
LPI	List of Performance Index
MC	NRW Management on Distribution
MD	NRW Management on Commerce
MNF	Minimum Night Flow
NRW	Non-Revenue Water
NWRI	National Water Resources Institute
Off-JT	Off the Job Training
OJT	On the Job Training
O&M	Operation and Maintenance
PC	Personal Computer
PDM	Project Design Matrix
PI	Performance Index
PMA	Pilot Metering Area
PRS	Planning, Research and Statistics (a Unit of FCTWB)
SMA	Sub Metering Area
UFW	Unaccounted for Water
USAID	United States Agency for International Development
WTP	Water Treatment Plant

Introduction

Federal Capital Territory Reduction of Non-Revenue Water Project (the Project) has set overall goal, project purpose and outputs to achieve the purpose as below:

Overall goal is: ‘Non-Revenue Water Reduction activities are routinely implemented in the service area of FCTWB’.

Project purpose is: ‘Capacity of FCTWB for NRW reduction is strengthened.’

Outputs to achieve project purpose are:

1. Level of NRW of both the service area of FCTWB and water distribution areas is monitored regularly.
2. Methods/operational procedures for effective NRW reduction are established through pilot projects at Pilot Metering Areas (PMAs) under pilot Area Offices.
3. A medium-term strategic plan of FCTWB for NRW reduction is developed, utilizing the results of Output 1 and 2.

In order to implement the Project steadily by FCTWB and project members to be empowered through capacity development by the JICA Expert Team, at the beginning of the Project, the Project made **Capacity Assessments (CA)** for setting up baseline and **Capacity Development (CD) Plan** at 1: **Organizational Level**, 2: **Individual Level** and 3: **Institution, Policy and Society Level**.

Firstly, concerning the CA as a baseline at organizational level, the Project analyzed data as of 2013 and 2014 and had interviews with Director and Head of Distribution Department of FCTWB. Secondly, in the light of the CA as a baseline at individual level, the Project had interviews with Project Technical Managers, NRW Management Team members (excluding administrative members) and NRW Action Team members (three Area Office managers and groups). Thirdly, the Project analyzed the CA of institution, policy and society level based on the existing information and interviews with some of NRW Management Team members.

The CD Plans for both organization and individuals are required primarily so as to achieve the project purpose. Secondly, an approach to aspect of institution, policy and society and encouragement to Federal Capital Territory Administration (FCTA) and FCTWB are significant actions to enhance their capacity and facilitate their performance. Furthermore, the Project focuses on sustainability of NRW reduction so that FCTWB can improve water supply services and ultimately approach to overall goal in the future.

For the CD plan at organizational level, the Project considered;

- Establishment of routine work on NRW reduction
- Introduction of vehicle and equipment required for creation of Pilot Metering Area (PMA) and Sub-Metering Area (SMA), database and flow measurement
- Sustainability of the work for permanent or semi-permanent team
- Periodical trainings

On the other hand, at individual level, the Project considered;

- Preparation of action plans (if applicable)
- Motivation for proactive measures against NRW
- Full understanding of NRW reduction operations and development of database for the existing distribution networks
- Accumulation of practical experience in NRW reduction operations through the pilot project

JICA Expert Team intensively directed the appointed Project members of the NRW Management Team and the NRW Action Team through individual CD plans.

In addition, the Project suggested an approach to aspects of institution, policy and society.

Capacity at both organizational and individual levels was scheduled to be monitored periodically by interim assessments and evaluated at the end of the Project, as shown below.

Table: Schedule of Capacity Assessment and Capacity Development Plan

	2014	2015	2016	2017	2018
Output-1					
Output-2					
Output-3					
CA&CD					

Remarks: Revised in September 2018

1 Capacity Assessment and Capacity Development Plan at Organizational Level

1.1 Capacity Assessment at Organizational Level

(1) CA Method

In principle, the capacity at organizational level was assessed by means of both **List of Performance Indicator (PI)** list and **Utility Basic Checklist**, which are a part of “*Handbook for Capacity Assessment on Urban Water Supply Sector and Water Supply Entity in Developing Country (published by JICA)*”.

The Project figured out PI by sorting out the data provided by FCTWB and interviewed and questioned Project Manager and Technical Manager of FCTWB according to the Utility Basic Checklist for water supply entity to collect information on water supply services related to NRW.

(2) Selection of CA Items

1) Performance Indicators (PI)

Procedures to select items in List of PI are shown **Figure 1-1**. Out of the whole 38 items, the Project sorted out 24 items to be improved through CD and then finally selected 13 items for setting up baseline related to NRW reduction among them (see **Table 1-1**).

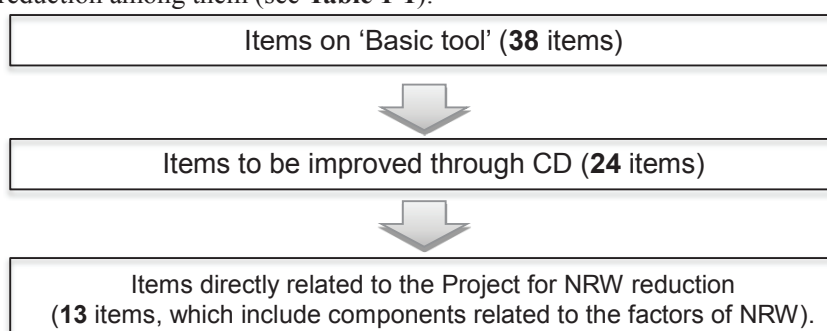


Figure 1-1: Procedures to Select the Items in List of Performance Index

Table 1-1: 13 Selected Items in List of Performance Index

Category	Sub-Cate.	13 Items (Index)
Technical aspects	Measures of NRW	NRW ratio (%)
		Water production (m ³ /day)
		Billed water (m ³ /day)
		Ratio of water meter installation
		Number of the water pipe breaks responded to within 24 hours (%)
		Quantity of NRW (m ³ /km/day)
Non-Technical aspects	Financial Performance	Quantity of NRW (m ³ /connection/day)
		Water tariff collection ratio (%)
		Billing amount (Naira x1000)
		Unit operational cost for water (Naira/m ³)
		Average revenue for water (Naira/m ³)
	Average revenue for water (Naira/m ³) based on collected tariff	
	Training	Total number of training days in the year on water supply sector (days/annual/staff)

2) Questions in Utility Basic Checklist for FCTWB

Procedures to select questions in Utility Basic Checklist for FCTWB are shown in **Figure 1-2**. Out of 26 questions of main parts, the Project sorted out 16 questions related to NRW consisting of two categories; one consists of one question to be improved by facility investment and the other consists of 15 questions to be improved by CD. The Project finally selected 10 questions for setting up baseline for the CA and the CD plan at organizational level in the Project, which are composed of one question of rehabilitation/ replacement, seven questions of technical aspects and two questions of non-technical aspects and (see **Table1-2**).

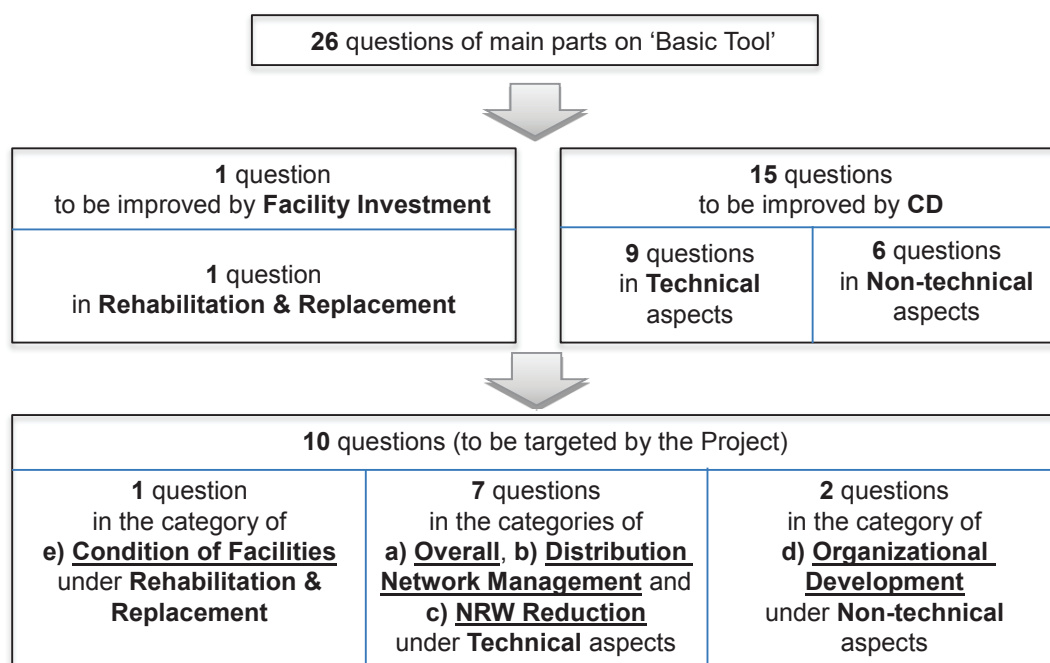


Figure 1-2: Procedures to Select Questions in Utility Basic Checklist for FCTWB

Table 1-2: 10 Selected Questions in Utility Basic Checklist

Category			10 Questions	Question No. in Checklist
Large	Medium	Small		
Aspects to be improved mainly by Facility Investment	Rehabilitation / Replacement	Condition of facilities	Condition of service connections	Q1
Aspects to be improved mainly by Capacity Development	Technical aspects	Overall	O&M of the facilities	Q2
		Distribution network management	Drawings of pipe facilities	Q3
			Zoning of distribution networks	Q4
			Water pressure at supply points	Q5
		NRW reduction	NRW ratio	Q6
			Installation of customer meters	Q7
	Non-Technical aspects	Organizational development	Installation of bulk meters	Q8
			Personnel management	Q9
		Implementation of training	Q10	

(3) Baseline and Result of Capacity Assessment at Organizational Level

1) Performance Indicators

Data on water supply services of FCTWB such as water production, billed water was supposed to be updated through measurement of bulk flow rate at Usuma Water Treatment Plant and billing improved by introduction of the new billing system. However, chamber construction of the bulk flow meters and introduction of the billing system were delayed due to budget disbursement and preparation in sorting-outs of subscribers of water use respectively. In addition, the financial statement as of 2015 and 2016 has not been reported in FCTWB officially. Therefore, the Project sorted out data of 2017 through the Project and applied it for final assessment as shown in **Table 1-3**. Since it is likely that baseline data based on FCTWB's original report was not so accurate, it is not necessarily appropriate to compare the baseline data with the final assessment data.

Some data such as water production and billed water as a baseline are not measured but estimated ones. FCTWB has roughly estimated water production by water flow into water treatment plants because of no bulk flow meters at outlets of clear water tanks located in water treatment plants. As well, FCTWB estimated billed water by given water consumption for unmetered customers. Therefore, the Project applies provisionally the estimated water production and billed water quantity as baseline.

Accordingly, NRW ratio in entire water service areas of FCTWB for the year 2014 was provisionally estimated at 60.7% based on the data provided by FCTWB and its area offices. In addition, each proportion of NRW components such as leakage, meter inaccuracy, illegal connection, etc. has not been determined, because of no or limited information of Minimum Night Flow (MNF), meter inaccuracy and actual number of illegal connections.

Table 1-3: Performance Indicators of Water Supply Services of FCTWB

Category	Sub-Category	Index	Historical Data		Remarks	Relevant Output
			As of 2014 (Baseline)	As of 2018 (Final CA)		
Technical aspects	Measures of NRW	NRW ratio (%)*	60.7	48.3	Baseline: Water Balance of FCTWB Year 2013 Final: Medium-Term Strategic Plan	1, 2, 3
		Water production (m ³ /day)	232,798	310,630	Baseline: JICA Preliminary Survey in August 2014 (Source: FCTWB) Final: Medium-Term Strategic Plan	1, 3
		Billed water (m ³ /day)	91,506	160,630	Baseline: Water Balance of FCTWB Year 2013 Final: Medium-Term Strategic Plan	1, 2, 3
		Ratio of water meter installation	85.3	93.4	Baseline: Billing Method Summary Report (as of Sep. 2014) by Area Offices Final: Through Output-1 of this Project Total Connections: 51,215 Water Meters installed: 47,843 * A number of automated estimate bills has remained.	1, 2
		Number of the water pipe breaks responded to within 24 hours (%)	N.A.	N.A.	Baseline: - Final: No answers about response within 24 hours because of the limited budget, logistics and discretion of expenditures for O&M particularly in Area Offices.	2
		Quantity of NRW (m ³ /km/day)	208.1	220.9	Baseline: JICA Expert Team, (232,798 - 91,506m ³ /day) / (44+296+339km) Final: the Project, (310,630-160,630m ³ /day) / (44+296+339km)	1, 2, 3

Category	Sub-Category	Index	Historical Data		Remarks	Relevant Output
			As of 2014 (Baseline)	As of 2018 (Final CA)		
		Quantity of NRW (m ³ /connection/day)	3.0	3.1	Baseline: JICA Expert Team, (232,798-91,506m ³ /day)/(47,610connections) Final: The Project, (310,630-160,630m ³ /day) / (47,843connections)	1, 2, 3
Non-technical aspects	Financial performance	Water tariff collection ratio (%)	47.0	31.3	Baseline: JICA Preliminary Survey in August 2013 (Source: Financial Statement 2012 of FCTWB) ● Revenue: N4,522.7million ● Collected: N2,125.7million Final: Financial Statement 2017 of FCTWB ● Revenue: N5,276.6million ● Collected: N1,651.3million * Not increased because of existence of return (duplicated) bills in the billing system which depresses collection ratio, and also frequent estimate bills and irregular billing cycle	1
		Billing amount (N. x1000)	4,522,708	5,276,600	Baseline: Financial Statement 2013 of FCTWB Final: Financial Statement 2017 of FCTWB	1
		Unit operational cost for water (N./m ³)	84.6	44.0	Baseline: Operational Cost: Production Cost (chemical, fuel, etc.) + Personnel Cost + Administrative Cost + Pension = N. 1,074,456,115 + N. 875,243,967 + N. 827,200,475 + N. 48,698,767 = N. 2,825,599,324 N. 2,825,599,324 / (91,506m ³ /day x 365 days) Final: Operational Cost: Production Cost (chemical, fuel, etc.) + Personnel Cost + Administrative Cost + Pension = N.1,083.5million + N.401.4million + N. 1,017.2million + N. 75.2million = N. 2,577.3million N. 2,577.3million / (160,630m ³ /day x 365 days)	1, 2
		Average revenue for water (N./m ³)	135.4	90.0	Baseline: N.4,522,708,000 / (91,506m ³ /day x 365 days) Final: N. 5,276.6million / (160,630m ³ /day x 365 days)	1, 2
		Average revenue for water (N./m ³) based on collected tariff	63.6	28.2	Baseline: N. 4,522,708,000 x 47% / (91,506m ³ /day x 365 days) Final: N. 5,276.6million x 31.3% / (160,630m ³ /day x 365 days)	1, 2
	Training	Total number of training days in the year on water supply sector (days/annual/staff)	0.009	0.011	Baseline: 4 times x 2 days = 8 days, 8 days / 880 staff members (proper) Final: 4 times x 2 days = 8 days, 8 days / 750 staff members (proper). * Considering OJT by the Project members on NRW, the indicator increases.	1, 2, 3

2) Result of Capacity Assessment at Organizational Level

The result of CA about 10 questions at organizational level is shown in **Table 1-4** and graphed in **Figure 1-3** (both include the final assessment results of CD). Capacity of water utility is qualitatively scored in

five levels; 1: Very Serious, 2: Serious, 3: Not Good Enough, 4: Good and 5: Very Good. Capacity of FCTWB is still not enough to conduct NRW reduction activities.

Capacity of FCTWB on Q2 O&M of the facilities, Q4 Zoning of Distribution Networks, Q8 Bulk Meters and Q10 Implementation of Training has been developed to some extent through the Project compared with that of baseline.

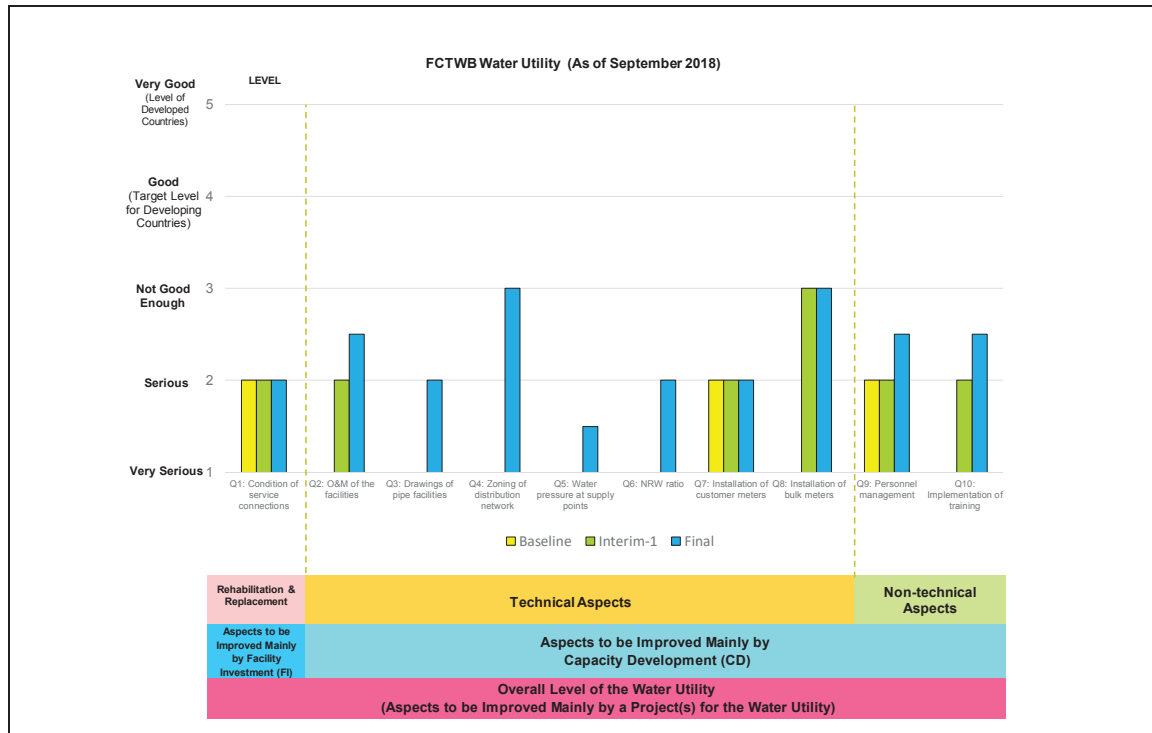


Figure 1-3: Result of Capacity Assessment by Utility Basic Checklist (Basic Tool)

The results of CA were analyzed by small category as follows:

- a) Condition of facilities
- b) Overall
- c) Distribution network management
- d) NRW reduction, and
- e) Organizational development

a) Condition of Facilities

The Project targets an item ‘service connections’ under “Conditions of facilities”, which consists of customer meters and service pipelines. In fact, a number of existing customer meters are in defective condition and service pipelines have deteriorated. Billed water of unmetered customers is usually estimated based on the given water consumption rate.

b) Overall

The small category ‘Overall’, one of technical aspect, corresponds to ‘operation & maintenance (O&M) of the water supply facilities’. An indicator of O&M of the facilities is whether FCTWB has an

appropriate O&M manual or not.

Any O&M manuals of pipeline facilities and NRW didn't exist in FCTWB including area offices, so O&M of those facilities has been taken based on experience of FCTWB's staff. However, the Project prepared the dedicated operation manuals for NRW reduction activities for area office managers & assistant areas managers, and working-level staff respectively.

c) Distribution Network Management

'Distribution network management' is composed of three items selected in Utility Basic Checklist; 'drawing of pipe facilities', 'zoning of distribution networks' and 'water pressure at customer meter points'. Each current status is as follows:

Drawing of Pipe Facilities

In the Pilot Project Area, the existing pipe networks were developed in database. However, most of maintenance staff members are currently engaged in regular maintenance without any drawings in the most of areas in Abuja, because drawings of pipe facilities exist partially in FCTWB and have not been organized, sorted out and shared properly. So, FCTWB has often encountered a difficulty in finding reliable data on diameter, material and exact location of existing pipelines, and consequently maintenance works of FCTWB is inefficient.

Zoning of Distribution Network

Water supply service area should be composed of some zones where distribution networks exist. In order to reduce NRW efficiently in the wide service areas, the areas seriously affected by NRW must be prioritized for taking measures NRW ratio, but most of the water supply service areas was not zoned (isolated) in terms of some aspects such as water flow, number of customers and topographical conditions, etc. The Project installed zonal flow meters at outlet of major tanks and upgraded billing system so that FCTWB measures/estimates system input volume and billed consumption for monitoring NRW in each zone. However, it is still not enough for FCTWB to calculate NRW ratio in each District Metered Area (DMA) so as to reduce NRW effectively.

Water Pressure at Customer Meter Points

It seems hardly water pressure at customer meter points is enough because of absence of monitoring by hydraulic analysis and leakage on pipelines. Ensuring optimum water pressure by hydraulic analysis and repair of leakages are some of the urgent actions. The Project developed the capacity of hydraulic analysis and procured water pressure loggers.

d) NRW Reduction

FCTWB has not learned actual NRW ratio of the entire water service areas of FCTWB, because of absence of bulk flow meters for measuring water production at water treatment plants and also absence of system for tallying all billed water consumption.

Prior to commencement of this Project, FCTWB did not implement NRW reduction systematically because they had neither any equipment such as bulk flow meters for District-Metered Area (DMA) nor measures on detection of invisible leakages and systematic detection of illegal connections. In addition, FCTWB lacks in experience of NRW reduction planning. Besides, it is not easy to measure water consumption accurately because more than 30% of all customers are defective water meters or missing. The Project installed bulk flow meter at outlet of Lower Usuma Water Treatment Plant and upgraded billing system so that FCTWB measures/estimates system input volume and billed consumption for monitoring NRW throughout Abuja. However, it is still not enough for FCTWB to calculate NRW ratio in each District Metered Area (DMA) so as to reduce NRW effectively.

e) Organizational Development

Working regulations and base salary system exist, but incentive schemes such as bonus, award and promotion based on certain criteria other than overtime allowance don't exist in FCTWB. Since autonomous of FCTWB was approved in December 2017, it is expected that incentive schemes will be developed in near future.

Regarding training system as a part of human resources development of FCTWB, prior to commencement of the Project, there are no staff eligible as trainers and no in-house training courses. However, some staff of the area offices learned the method and enabled to train other staff through the practical training in this Project in terms of leakage detection.

FCTWB has still relied on non-periodical outside trainings and also international trainings. Therefore, it is a key challenge for FCTWB to train staff continuously and systematically.

Table 1-4: Capacity Assessment at Organization Level (Baseline, Interim and Final)

Category	Project Type	Priority	Question (Reference No. of the same indicator if it is included in BT (1): LP1)	Level					Achieved Level (1-5)		
				1: Very Serious This level reflects the conditions of water utilities which need all-round assistance in <u>all</u> fields.	2: Serious This level reflects the conditions of water utilities which need broad assistance in <u>many</u> fields.	3: Not Good Enough This level is reflects the conditions of water utilities which need partial assistance in <u>some</u> fields.	4: Good This level reflects the conditions which water utilities in <u>developing</u> countries should aim for in the foreseeable future.	5: Very Good This level reflects the conditions of water utilities in <u>developed</u> countries.	Baseline	Interim	Final
Aspects to be improved mainly by Facility Investment (FI)	Large			95 - 100% of house connections are more than 25 years old.	80 - 94% of house connections are more than 25 years old.	60 - 79% of house connections are more than 25 years old.	40 - 59% of house connections are more than 25 years old.	0 - 39% of house connections are more than 25 years old.	2	2	2
	Medium	FI	Q1: Service connections ¹						2	2	2
Aspects to be improved mainly by Capacity Development (CD)	Small			Facilities do not have any O&M manuals.	Facilities have O&M manuals which are <u>not</u> effective, leading to O&M deficiencies.	Facilities have O&M manuals which are <u>not</u> effective, however the current O&M is adequate.	Facilities have effective O&M manuals, which are followed reasonably well.	Facilities have effective and comprehensive O&M manuals, which are followed strictly.	1	2	2.5
	Overall	CD	Q2: O&M of the facilities	Available paper drawings of existing transmission and distribution trunk mains are <u>quite limited</u> .	Paper drawings are available for most of the existing transmission and distribution trunk mains, but drawings for branch distribution mains are <u>limited</u> .	Small/Medium utilities: Paper drawings are available for most of the existing distribution mains including branch distribution mains. Large utilities: As above, and a <u>primitive GIS</u> has been established for transmission mains, trunk distribution mains, etc.	Small/Medium utilities: Updated CAD files are available for most of the existing transmission and distribution mains. Large utilities: A GIS has been well-established and updated for management of transmission mains and distribution mains, with reasonable accuracy.	Small/Medium utilities: A map book of existing mains has been prepared for referencing and is periodically updated using CAD. Large utilities: A GIS has been well-established and updated for management of transmission, distribution mains, customer information, etc. with <u>good</u> accuracy.	1	1	2
				Average (Rehabilitation/Replacement)					2.0	2.0	2.0
				AVERAGE (F)					2.0	2.0	2.0

Category			Project Type	Priority	Question (Reference No. of the same indicator if it is included in BT (1): LPI)	Level					Achieved Level (1-5)		
						1: Very Serious This level reflects the conditions of water utilities which need all-round assistance in <u>all</u> fields. <u>Proper zoning of distribution areas and proper sub-zoning of networks in each distribution area, based on considerations of topology and/or different water sources, rarely exist or do not exist at all.</u>	2: Serious This level reflects the conditions of water utilities which need broad assistance in <u>many</u> fields. <u>Proper zoning of distribution areas exists to some extent, but proper sub-zoning of networks in each distribution area rarely exists or does not exist at all.</u>	3: Not Good Enough This level is reflects the conditions of water utilities which need partial assistance in <u>some</u> fields. <u>Most distribution areas are properly zoned, but proper sub-zoning of networks in each distribution area is still limited.</u>	4: Good This level reflects the conditions which water utilities in <u>developing</u> countries should aim for in the foreseeable future. <u>All the distribution areas are properly zoned, and most distribution areas have proper sub-zoning in their distribution networks.</u>	5: Very Good This level reflects the conditions of water utilities in <u>developed</u> countries.	Baseline	Interim-1	Final
Large	Medium	Small	CD/ FI	1st	Q4: Zoning of distribution networks ²						1	1	3
					Q5: Water pressure at customer meter points ³		At approximately half of the points, pressure is <u>not</u> between 5-45m. At most or all points, pressure is <u>not</u> between 5-45m.	At approximately a quarter of the points, pressure is <u>not</u> between 10-45m. At most points, usual pressure is between 10-45m but pressure <u>drops</u> significantly in the season of maximum water demand.	At most points, pressure is between 15-45m <u>without</u> significant pressure <u>drop</u> in the season of maximum water demand, or <u>continuous</u> and <u>direct</u> water <u>supply</u> with higher pressure to high buildings without using customers' receiving and elevated tanks has been introduced for <u>water quality control</u> .	1	1	1.5	
Aspects to be improved mainly by Capacity Development (CD)	Technical aspects	NRW reduction	CD/ FI	1st	Q6: NRW ratio ⁴		36 - 50%	21 - 35%	10 - 20%	Less than 10%	1	1	2

Category		Project Type	Priority	Question (Reference No. of the same indicator if it is included in BT (1): LPI)	Level					Achieved Level (1-5)		
					1: Very Serious This level reflects the conditions of water utilities which need all-round assistance in all fields. There are <u>no</u> customer meters due to a flat-rate system, or the majority of existing customer meters are not functioning.	2: Serious This level reflects the conditions of water utilities which need broad assistance in many fields. Functioning customer meters are supposed to be installed for every household, but <u>more than 30%</u> of them are <u>missing</u> , or <u>not working well</u> .	3: Not Good Enough This level is reflects the conditions of water utilities which need partial assistance in some fields. Functioning customer meters are supposed to be installed for every household and replaced with new ones periodically, but <u>more than 10%</u> of them are <u>missing or not working well</u> .	4: Good This level reflects the conditions which water utilities in <u>developing countries</u> should aim for in the foreseeable future. <u>Most</u> households have well-functioning customer meters due to rigorous periodical meter exchange.	5: Very Good This level reflects the conditions of water utilities in <u>developed countries</u> .	Baseline	Interim-1	Final
Large	Medium	CD/ FI	1st	Q7: Customer meters ⁵	There are <u>not enough</u> functioning bulk meters installed at the places requiring them for accurate measurement of water production and basic control of distribution are <u>not installed at most</u> of the places where they should be; <u>or most of</u> the existing bulk meters <u>do not work well</u> due to lack of maintenance.	There are <u>not enough</u> functioning bulk meters installed at the places requiring them for accurate measurement of water production and basic control of distribution, but <u>not enough for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction</u> . <u>Majority</u> of the existing bulk meters are <u>well maintained</u> .	There are enough functioning bulk meters installed for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction. <u>Most of</u> the existing bulk meters are <u>well maintained</u> , and important meter readings are <u>recorded periodically</u> .	There are enough functioning bulk meters installed (with good accuracy) for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction. <u>All of</u> the existing bulk meters are <u>well maintained</u> , and important meter readings are <u>recorded periodically and analyzed effectively</u> .		2	2	2
				Q8: Bulk meters ⁶		There are enough functioning bulk meters installed for accurate measurement of water production and basic control of distribution, but <u>not enough for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction</u> . <u>Majority</u> of the existing bulk meters are <u>well maintained</u> .	There are enough functioning bulk meters installed for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction. <u>Most of</u> the existing bulk meters are <u>well maintained</u> , and important meter readings are <u>recorded periodically</u> .	There are enough functioning bulk meters installed (with good accuracy) for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction. <u>All of</u> the existing bulk meters are <u>well maintained</u> , and important meter readings are <u>recorded periodically and analyzed effectively</u> .	1	3	3	
Average (Technical)					1.1	1.6	2.3					
Large	Medium	CD	1st	Q9: Effective personnel management rules and regulations including incentives ⁷	Working regulations and base salary systems are <u>not clear</u> .	Working regulations and base salary systems are <u>clear</u> , but there is <u>no incentive scheme</u> in place.	Working regulations and base salary systems are <u>clear</u> , there are <u>effective incentive schemes</u> in place. <u>Some critical rules</u> on occupational health and safety are communicated to staff.	Working regulations and base salary systems are <u>clear</u> , and there are <u>effective incentive schemes</u> in place. <u>Full set of regulations</u> on occupational health and safety are communicated to staff.		2	2	2.5
				Organization at development								

Category		Project Type	Priority	Question (Reference No. of the same indicator if it is included in BT (①): LPI)	Level					Achieved Level (1-5)		
					1: Very Serious This level reflects the conditions of water utilities which need all-round assistance in <u>all</u> fields.	2: Serious This level reflects the conditions of water utilities which need broad assistance in <u>many</u> fields.	3: Not Good Enough This level is reflects the conditions of water utilities which need partial assistance in <u>some</u> fields.	4: Good This level reflects the conditions which water utilities in <u>developing</u> countries should aim for in the foreseeable future.	5: Very Good This level reflects the conditions of water utilities in <u>developed</u> countries.	Baseline	Interim-1	Final
Large	Medium			Training is quite rare or not provided at all.	A limited number of training programs on some aspects is provided, however there are no incentives for staff to undertake training programs.	There are <u>minimum</u> levels of training required for <u>important</u> aspects, but <u>incentives</u> for staff to undertake training programs are <u>limited</u> .	An adequate number of training programs are provided on <u>important</u> aspects, including management and technical matters. There are enough incentives for staff to undertake training programs.	This level reflects the conditions of water utilities in <u>developed</u> countries.		1.5	2.0	2.5
				Q10: Implementation of training ⁸						1.3	1.8	2.4
Average (Non-technical)										1.7	1.9	2.2
OVERALL AVERAGE (FI & CD)												

Note:

*1: Expected lifetime of house connections can be 25 years or more if using corrosion-resistant materials.

*2: Proper zoning and sub-zoning of distribution networks is a basic requirement for good pressure control, effective reduction of NRW, etc. The concept of zoning and sub-zoning is explained in (2) *Supporting Figures and Table*.

*3: Conversion table for different units of pressure is shown in (2) *Supporting Figures and Table*.

*4: Non-Revenue Water (NRW) ratio = (1-(annual water charged) / (annual water produced)) x 100
If all the bulk meters necessary for this calculation are not installed, estimation of this average NRW ratio can be carried out based on some data of NRW in some areas.

The difference between NRW and UFW (Unaccounted for Water) is explained in (2) *Supporting Figures and Table*.

*5: Expected lifetime of customer meters is usually between 8 and 10 years, depending on their type and quality.

*6: Recommended calibration intervals for bulk flow meters are 5 years for wheel/mechanical type and 1 year for electromagnetic and ultrasonic types.

The size of District-Metered Area (DMA) is recommended to be about 1,000 - 3,000 households.

*7: Personnel management rules and regulations include: 1) working regulations, 2) base salary system, 3) incentive schemes, and 4) occupational health and safety regulations.

*8: Training programs are required for engineers, technicians, administration staff, managers, etc.

1.2 Capacity Development Plan at Organizational Level

(1) Capacity Needs of FCTWB

10 capacity needs of FCTWB become targets of CD at organizational level in the Project. **Table 1-5** shows the needs and organizational responsibilities in the Project in terms of finance and logistics, to be taken by FCTWB with support from JICA.

Table 1-5: Capacity Needs and Organizational Responsibilities in the Project

No.	Small Category	Capacity Needs	Organizational Responsibilities in the Project
1	Condition of facilities	To improve of service connections	<ul style="list-style-type: none"> ● Procurement of test-meter and customer meters, and installation or replacement (as a part of NRW reduction) ● Repair of leakages (as a part of NRW reduction)
2	Overall	To enhance O&M of the facilities	<ul style="list-style-type: none"> ● Preparation of O&M manual on NRW reduction
3	Distribution network management	To make drawings of pipe facilities	<ul style="list-style-type: none"> ● Procurement of GIS software, GPS handset, PCs and plotter ● Training of GIS operation ● Improvement and update of database
4		To zone distribution networks	<ul style="list-style-type: none"> ● Creation of PMAs and SMAs ● Procurement and installation of valves for isolation and bulk flow meters for PMAs and SMAs
5		To ensure optimum pressure at customer meter points	<ul style="list-style-type: none"> ● Procurement of hydraulic analysis software ● Training of hydraulic analysis software operation ● Identification of pipelines to be replaced by larger or smaller ones and also service areas to be targeted by pressure control ● Repair of leakages (as a part of NRW reduction)
6	NRW reduction	To measure NRW ratio accurately and reduce it	<ul style="list-style-type: none"> ● Procurement and installation of ultrasonic flow meters at outlets of clear water tanks located in water treatment plants ● Modification of system for tallying water consumption (billed water) ● Procurement of vehicles, ultrasonic flow meter, data logger, leak detector, correlator, test-meter and customer meters, etc. ● Identification of NRW components such as detection of invisible leakages and illegal connections, meter functioning check, measurement of meter inaccuracy ● NRW reduction operations such as repair of leakages, disconnection or legalization of illegal connections, installation or replacement of customer meters. ● Preparation of NRW reduction strategic plan
7		To install customer meters	<ul style="list-style-type: none"> ● Procurement and installation or replacement of customer meters (as a part of NRW reduction)
8		To install bulk meters	<ul style="list-style-type: none"> ● Procurement and installation of bulk flow meters for PMAs and SMAs (as a part of distribution network management) ● Procurement and installation of ultrasonic flow meters at outlets of clear water tanks located in water treatment plants (as a part of NRW reduction) ● JICA Expert Team encourages FCTWB to facilitate installation of bulk flow meters proposed in existing study.
9	Organizational development	To ensure effective personnel management rules & regulations including incentives	<ul style="list-style-type: none"> ● JICA Expert Team encourages and supports FCTWB to adopt incentive schemes
10		To implement trainings periodically and systematically	<ul style="list-style-type: none"> ● Systematized lectures, trainings and OJTs on NRW reduction with consideration for sustainability ● Trainings abroad (in Japan) ● Periodical workshops/seminars for information sharing

(2) Principles and Capacity Development Plan at Organizational Level

1) Principles

The Project sets principles by small category as follows:

a) Condition of Facilities

Well-functioning customer meters should be installed so that FCTWB can measure water consumption accurately and reduce NRW at customer meters and along service pipelines.

b) Overall

The Project assists in NRW reduction operations and preparation of their manuals in order for concerned staff members to carry on NRW reduction sustainably even after the Project terminates.

c) Distribution Network Management

The Project contributes to development of database by using GIS to improve drawings of pipe facilities as a fundamental tool for distribution network management and eventually NRW reduction.

In order to reduce NRW promptly and effectively and monitor it, zoning of distribution networks is a solution in consideration of water flow, service population and topographic conditions. The Project assists in creating Pilot Metering Area (PMA) and Sub-Metering Area (SMA), which are zoned service areas for NRW reduction operations.

Repair of leakages as a part of NRW reduction can contribute to an improvement of water pressure at customer meter points.

d) NRW Reduction

Through various trainings and utilization of equipment to be procured under the Project, JICA supports FCTWB in NRW reduction, particularly measuring water production from water treatment plants, tallying water consumption, detecting invisible leakages and illegal connections, analyzing collected data and preparing NRW reduction strategic plan in consideration of properly-phasing and sustainability.

It is essential that the Project verifies methods for calculating NRW ratio and establishes optimum calculation model and workflow for IWA water balance in order to set up goal of NRW reduction through steady improvement in accuracy of NRW ratio and components. It is also a matter of importance to appoint staff members properly to deal with unforeseen circumstances such as transfer and turning over of staffs during the project implementation period.

e) Organizational Development

It is advisable to make FCTWB autonomous as soon as possible. During the Project, JICA encourages FCTWB to take ownership of the Project and to adopt incentive schemes, such as performance-based personnel evaluation system, so as to enhance motivation of the staff members.

The Project considers systematic manners of information sharing among staff members so that

knowledge and experiences obtained through on-the-job trainings (OJT) and trainings abroad can be shared properly. Also, the Project aims at training of trainers-to-be as well as common staff members for sustainability and future expansion of NRW reduction into other Area Offices.

2) Capacity Development Plan at Organizational Level

Based on the above capacity needs and principles, the Project prepared Capacity Development (CD) Plan of FCTWB during project implementation (see **Table 1-7**). The goal of achievement shown in the table conforms to the Utility Basic Checklist in principle, but their contexts were slightly modified according to situation of FCTWB, current water supply services and scope of the Project.

(3) Results of Capacity Development at Organizational Level

As shown in **Table 1-3** and **Table 1-7**, the following **Table 1-6** shows the results of capacity development at organizational level, by comparison among baseline level, the target level by CD and actual achieved level. The second interim assessment was scheduled originally, but not conducted and combined to the final assessment in consideration of delay of pilot project.

Table 1-6: Rate Comparison among Baseline, Target and Actual Achieved Level

Question Item	Baseline Level	Target Level by CD	Actual Achieved Level (Final)
Service connections	2	3	2
O&M of the facilities	1	4	2.5
Drawings of pipe facilities	1	3	2
Zoning of distribution networks	1	2	3
Water pressure at customer meter points	1	1	1.5
NRW ratio	1	2	2
Customer meters	2	3	2
Bulk meters	1	3	3
Effective personnel management rules and regulations including incentives	2	4	2.5
Implementation of training	1	4	2.5

Table 1-7 Capacity Development Plan at Organization Level

No.	Category	Capacity Needs	Baseline as of Dec-2014		Targets			Approaches to achieve the Targets		
			Current Status	Rating Max. 5	Interim-1 as of Feb-2016 (*original schedule)	Interim-2 as of Feb-2017 (*not conducted)	Final as of Feb-2018 (*original schedule)	Rating Max. 5	Interim-1 Jan-2015 to Feb-2016 (*original schedule)	Interim-2 Mar-2016 to Feb-2017 (*not conducted)
1	Condition of facilities	To improve condition of service connections ¹	80-94% of house connections are more than 25 years old.	2	80-94% of house connections are more than 25 years old.	80-79% of house connections are more than 25 years old.	3	To install new customer meters or replace existing meters by new ones and repair service pipelines for <u>about</u> 1,000 in the selected PMAs.	To install new customer meters or replace existing meters by new ones and repair service pipelines for <u>about</u> 1,500 in the selected PMAs.	To install new customer meters or replace existing meters by new ones and repair service pipelines for <u>about</u> 400 in the selected PMAs.
2	Overall	To enhance O&M of the facilities	Facilities <u>do not have any</u> O&M manuals.	1	Facilities <u>have effective</u> O&M manuals, which are <u>followed reasonably well</u> .	Facilities <u>have effective</u> O&M manuals, which are <u>followed reasonably well</u> .	4	To collect and organize data, and materials required for O&M manuals for NRW reduction.	To develop O&M manuals for NRW reduction based on the lessons learnt through Pilot Projects.	To update and modify O&M manuals for NRW reduction based on the lessons learnt through activities following Pilot Projects.
3		To make drawings of pipe facilities	Available paper drawings of existing transmission and distribution trunk mains are <u>quite limited</u> .	1	Paper drawings are available for most of the existing distribution mains <u>including branch</u> distribution mains.	<u>Updated CAD (or database) files</u> are available for most of the existing transmission and distribution mains.	3	To develop GIS database of existing distribution networks in the selected PMAs.	To develop GIS database of existing distribution networks in the selected PMAs and also develop GIS database of existing distribution mains in water services area.	To develop GIS database of existing distribution networks in some other areas and also update GIS database of existing distribution mains in water services area.
4	Distribution network management	To zone distribution networks ²	Proper zoning of distribution areas and proper sub-zoning of networks in each distribution area, based on considerations of topology and/or different water sources, <u>rarely exist or do not exist</u> at all.	1	Proper zoning of distribution areas <u>exists to some extent</u> , but proper sub-zoning of networks in each distribution area <u>rarely exists or does not exist</u> at all.	Proper zoning of distribution areas <u>exists to some extent</u> , but proper sub-zoning of networks in each distribution area <u>rarely exists or does not exist</u> at all.	2	To create PMAs and SMAs in the selected PMAs.	To create PMAs and SMAs in the selected PMAs.	To create DMAs and Sub-DMAs in some other areas. To demarcate DMAs and Sub-DMAs in water services area.

No.	Category	Capacity Needs	Baseline as of Dec-2014		Targets			Approaches to achieve the Targets		
			Current Status	Rating Max. 5	Interim-1 as of Feb-2016 (*original schedule)	Interim-2 as of Feb-2017 (*not conducted)	Final as of Feb-2018 (*original schedule)	Rating Max. 5	Interim-1 Jan-2015 to Feb-2016 (*original schedule)	Interim-2 Mar-2016 to Feb-2017 (*not conducted)
5	Distribution network management	To ensure optimum pressure at customer meter points ³	At most or all points, pressure is <u>not</u> between 5-45m.	1	At most or all points, pressure is <u>not</u> between 5-45m.	At most or all points, pressure is <u>not</u> between 5-45m.	1	To repair leakages in the selected PMAs, this contributes to optimization of water pressure.	To repair leakages in the selected PMAs, this contributes to optimization of water pressure.	To repair leakages in some other areas, this contributes to optimization of water pressure. To conduct hydraulic analysis of existing distribution mains in water services area, this contributes to identify pipeline routes to be replaced and areas to be targeted for pressure control.
6	NRW reduction	To measure NRW ratio accurately and reduce it ⁴	More than 50%	1	36-50%	36-50%	2	To calculate NRW ratio monthly through bulk flow installation and billing system modification, and conduct NRW reduction operations in the selected PMAs.	To calculate NRW ratio monthly, and conduct NRW reduction operations in the selected PMAs.	To calculate NRW ratio monthly, monitor NRW and conduct necessary measures in the selected PMAs, and expand NRW reduction operations into some other areas. To prepare NRW reduction strategic plan.
7	NRW reduction	To install customer meters ⁵	Functioning customer meters are supposed to be installed for every household, but more than 30% of them are <u>missing or not working well</u> .	2	Functioning customer meters are supposed to be installed for every household and replaced with new ones periodically, but more than 10% of them are <u>missing or not working well</u> .	Functioning customer meters are supposed to be installed for every household and replaced with new ones periodically, but more than 10% of them are <u>missing or not working well</u> .	3	To install new customer meters or replace defective ones by new ones for about 400 in the selected PMAs.	To install new customer meters or replace defective ones by new ones for about 400 in the selected PMAs.	To install new customer meters or replace defective ones by new ones for about 200 in the selected PMAs.

No.	Category	Capacity Needs	Baseline as of Dec-2014		Targets			Approaches to achieve the Targets		
			Current Status	Rating Max. 5	Interim-1 as of Feb-2016 (*original schedule)	Interim-2 as of Feb-2017 (*not conducted)	Final as of Feb-2018 (*original schedule)	Rating Max. 5	Interim-1 Jan-2015 to Feb-2016 (*original schedule)	Interim-2 Mar-2016 to Feb-2017 (*not conducted)
8	NRW reduction	To install bulk meters ⁶	Bulk meters for accurate measurement of water production and basic control of distribution are <u>not installed at most of the places</u> where they should be; <u>or most of the existing bulk meters do not work well</u> due to lack of maintenance.	1	There are <u>enough</u> functioning bulk meters for accurate measurement of water production and basic control of distribution, but <u>not enough for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction.</u> Majority of the existing bulk meters are <u>well maintained.</u>	There are <u>enough</u> functioning bulk meters for accurate measurement of water production and basic control of distribution, but <u>not enough for calculating NRW ratio of each sub-zone (DMA) for effective NRW reduction.</u> Majority of the existing bulk meters are <u>well maintained.</u>	3	To install bulk flow meters at both outlets from clear water tanks located in water treatment plants and inlets to the selected PMAs. JICA encourages FCTWB to install bulk flow meters proposed in existing study.	To install bulk flow meters at inlets to the selected PMAs. JICA encourages FCTWB to install bulk flow meters proposed in existing study.	To install bulk flow meters at inlets to some other areas. JICA encourages FCTWB to install bulk flow meters proposed in existing study.
9		To ensure effective personnel management rules and regulations including incentives ⁷	Working regulations and base salary systems are <u>clear</u> , but there is <u>no incentive scheme</u> in place.	2	Working regulations and base salary systems are <u>clear</u> , but existing <u>incentive schemes are ineffective.</u>	Working regulations and base salary systems are <u>clear</u> , there are <u>effective incentive schemes</u> in place. Some <u>critical rules on occupational health and safety</u> are communicated to staff.	4	JICA encourages FCTWB to consider adoption of incentive schemes.	JICA supports FCTWB to adopt incentive schemes on a trial basis.	JICA supports FCTWB to establish effective incentive schemes.
10	Organizational development	To implement trainings periodically and systematically ⁸	Training is <u>quite rare or not provided</u> at all.	1	A <u>limited number of</u> training programs on <u>some aspects</u> is provided, however there are no incentives for staff to undertake training programs.	There are <u>minimum levels of training</u> required for <u>important aspects</u> , but <u>incentives for staff to undertake training programs are limited.</u>	An <u>adequate number of</u> training programs are provided on <u>important aspects</u> , including management and technical matters. There are <u>enough incentives</u> for staff to undertake training programs.	4	JICA conducts lectures, trainings and OJTs, and also provides training in Japan on mainly NRW reduction operations with emphasis on development of human resources (i.e. trainers-to-be), so that FCTWB can implement in-house trainings in a periodical and systematic manner.	JICA conducts lectures, trainings and OJTs, and also provides training in Japan on mainly NRW reduction strategic planning with emphasis on development of human resources (i.e. trainers-to-be), so that FCTWB can update and renew the strategic plan.

2 Capacity Assessment and Capacity Development Plan at Individual Level

2.1 Capacity Assessment at Individual Level

(1) CA Methods

The Project applies the CA methods such as interactive interview, questionnaire, mini-test and practical test.

(2) Members assessed (Assesses)

The Project assessed both NRW Management Team members and NRW Action Team members (see Table 2-1).

Table 2-1: Members assessed (Original Assesses)

S/N	Name or Group	Position in FCTWB (Position in the Project)	CA Areas*1
NRW Management Team			
01MD	Engr. A. A. Nahuche (Mr.)	General Manager (Project Manager)	MD
02MC	Adis S. Muhammad (Mr.) *Transferred	HoD: Commerce (Technical Manager)	MC
<i><Distribution Department></i>			
03MD	Engr. Abolade. R. Lawal (Mr.)	HoD: Distribution (Technical Manager)	MD
04MD	Engr. Moh. Kabir Rabi (Mr.)	HoU: NRW Reduction	MD, GIS&HA
05MD	Musa Dikko (Mr.)	HoU: Pipeline	MD
06MD	Shehu Suleiman (Mr.)	HoU: GIS	MD, GIS&HA
07MD	Engr. Douglas Oloton (Mr.) *Transferred	Former HoU: Metering General	MD
08MD	Engr. A.O. Akande (Mr.) *Transferred	Metering Unit (AMR Meter)	MD
09MD	Engr. Yetunde Olaniyan (Ms.) *Transferred	HoU: Water Monitoring	MD
10MD	Engr. Abdullahi Masaud (Mr.)	Area Manager: Gwarimpa	MD
11MD	Abubakar U. Abubakar (Mr.)	NRW Reduction Unit	MD, GIS&HA
12MD	Mohammed Dauda (Mr.)	Pipeline Unit	MD
13MD	Ezeh Hilary (Mr.)	Surveyor, GIS Unit	GIS&HA
<i><Commerce Department></i>			
14MC	Isaac O. Owolabi (Mr.) *Transferred	HoU: Customer Care	MC
15MC	Danjuma Isah (Mr.)	HoU: Monitoring and Detection	MC
16MC	Taiwo Adeyemi (Mr.)	Monitoring & Detection Unit	MC
17MC	Aliyu Maradun (Mr.) *Transferred	HpU: Major Consumers	MC
18MC	Rose Akpan (Mrs.)	HoU: Billing	MC
19MC	Suleman Agbawn (Mr.) *Transferred	Billing Unit	MC
29MD	Abulrahman Shehu Sani (Mr.)	HoU: Metering General	MD
30MD	Abdulrahman Muhammed (Mr.)	NRW Reduction Unit	MD, GIS&HA
31MD	Igbinosa Courage (Mr.)	NRW Reduction Unit	MD
NRW Action Team			
20AD	Muhammed A. S. Ramat (Mr.) *Transferred	Jabi Area Manager (Team Leader)	MD
21AD	Leakage Detection Group	4 members / Distribution	AD
22AC	Commerce Group	5 members / Commerce	AC
23AD	Habib Ahmed Kiru (Mr.) *Transferred	Gudu Area Manager (Team Leader)	MD
24AD	Leakage Detection Group	3 members / Distribution	AD
25AC	Commerce Group	3 members / Commerce	AC
26AC	Adesoji Adenuga (Mr.) *Transferred	Garki I Area Manager (Team Leader)	MD
27AD	Leakage Detection Group	5 members / Distribution	AD
28AC	Commerce Group	4 members / Commerce	AC

Note: MD: NRW Management on Distribution
MC: NRW Management on Commerce
GIS&HA: GIS and Hydraulic Analysis

AD: NRW Action on Distribution
AC: NRW Action on Commerce

(3) CA Areas

The CA at individual level mainly on NRW reduction varies depending on the area of expertise in which he/she engages or the Department/Unit/Area Office to which he/she belongs. The above **Table 2-1** also shows the CA area for each member, which is grouped into the following five (5) areas:

- 1) NRW Management on Distribution (MD)
- 2) NRW Management on Commerce (MC)
- 3) GIS & Hydraulic Analysis (GIS&HA)
- 4) NRW Action on Distribution (AD)
- 5) NRW Action on Commerce (AC)

Each CA area consists of some assessment axes, which are rated between less than 0.5 as minimum/inexperience and 3.0 as maximum/target. Description of the rating is shown in **Table 2-2** and CA areas are described below:

Table 2-2: Description of Rating

Description	Rating
Excellent (outstanding understanding and initiative for in-house training)	3.0
Very good (considerable/significant understanding)	2.5 or more
Good (sufficient understanding)	2.0 or more
Average (satisfactory level)	1.5 or more
Fair (unsatisfactory level, but promise in the future improvement)	1.0 or more
Poor (unsatisfactory level)	0.5 or more
None (inexperience)	Less than 0.5

1) NRW Management on Distribution (MD)

The CA consisting of nine assessment axes as below was intended for a Technical Manager and NRW Management Team members from Distribution Department and NRW Action Team Leaders (Area Managers).

- Data Management Ability: to assemble reports and tally data from staff members and sections.
- Data Collection Ability: to grasp where data is and collect data.
- Data Utilization Ability: to analyse and utilize data.
- Water Balance: to understand components of NRW and calculate their ratio.
- Planning Ability: to understand requirement and priority for planning, and make plans.
- Sustainability: to understand budget allocation, manuals and review of plans.
- Basics of Leakage Detection Equipment: to understand equipment, their functions for planning.
- Basics of Leakage Detection Method: to understand methods, advantages and combinational use for planning, and estimate leakage volume.
- Mechanism and Characteristics of Leakage: to understand leakage properly and technically.

2) NRW Management on Commerce (MC)

The CA consisting of five assessment axes as below was intended for a Technical Manager and NRW Management Team members from Commerce Department.

- Data Management Ability: to assemble reports and tally data from staff members and sections.
- Data Collection Ability: to grasp where data is and collect data.
- Data Utilization Ability: to analyse and utilize data.
- Water Balance: to understand components of NRW and calculate their ratio.
- Sustainability: to understand budget allocation, manuals and review of plans.

3) GIS & Hydraulic Analysis (GIS&HA)

The CA consisting of eight assessment axes as below was intended for NRW Management Team members from Distribution Department.

- Basics of GIS: to understand advantages, data to be input and their utilization.
- Software Operation of GIS: to master how to operate GIS software practically.
- Data Adjustment of GIS: to find out data deficiency and update them.
- Evaluation of GIS: to evaluate outputs and improve them.
- Basics of HA: understand concept, purpose and data.
- Software Operation of HA: to master how to operate HA software practically.
- Data Adjustment of HA: to find out data deficiency and update them.
- Evaluation of HA: to evaluate outputs and improve them.

4) NRW Action on Distribution (AD)

The CA consisting of six assessment axes as below was intended for Leakage Detection Groups under NRW Action Team from Pilot Area Offices, in charge of physical/real losses.

- Knowledge of NRW and Leak: to understand basics of NRW and leak noise.
- NRW Reduction Equipment: to understand function and advantage of equipment.
- O&M of NRW Reduction Equipment: to master O&M of equipment.
- NRW Reduction Methodology: to understand methods, advantages and combinational use, and master them practically.
- Record: to record NRW reduction operations properly.
- Report: to report NRW reduction operations properly to management or semi-management.

5) NRW Action on Commerce (AC)

The CA consisting of six assessment axes as below was intended for Commerce Groups under NRW Action Team from Pilot Area Offices, in charge of unbilled authorized consumption and commercial/apparent losses including illegal connections and customer meter inaccuracy.

- Knowledge of NRW and Commercial Loss: to understand basics of NRW and commercial loss
- Unauthorized Consumption (Illegal Connection): to understand bad effect by illegal connection, and seek systematic detection of them, and disconnect/legalize them.
- Customer Meter Reading and Inaccuracy: to understand meter-related problems properly and master checking inaccuracy by equipment, and find meters to be installed/replaced.
- Customer List and Complaints: to understand which items to be listed and importance of uniform management, and how to deal with complaints.
- Record: to record NRW reduction operations properly.
- Report: to report NRW reduction operations properly to management or semi-management.

(4) Results of Capacity Assessment at Individual Level

In late November and early December 2014, the Project conducted CAs to set up baseline by interactive interview and questionnaire. Scoring criteria are not exactly same, particularly, scoring of management-positioned members is relatively rigorous because of his/her role and responsibility. The Project also conducted an interim assessment and the final assessment. The second interim assessment was scheduled originally, but not conducted and combined to the final assessment in consideration of delay of pilot project.

The CA result at individual level was summarized below by CA area and assessment axis, and also results of all CAs including the final assessment after CD (described below) are shown in **Figure 2-1**.

1) NRW Management on Distribution (MD)

The results differ in individuals. Data management and collection, water balance, planning and sustainability were rated at between Average and Good, while data utilization, leakage detection and its mechanism and characteristics were rated at less than Average because of inexperience. Their understanding should have been ensured.

2) NRW Management on Commerce (MC)

On the whole, most of assessment axes were rated at Good. Their understanding particularly of water balance should have been ensured.

3) GIS & Hydraulic Analysis (GIS&HA)

Except software operation of GIS targeting members belonging to GIS unit, which was rated at Average, most of assessment axes were rated at less than Fair or Poor. This result indicated necessity of supports to members for effective utilization GIS and practice of hydraulic analysis.

4) NRW Action on Distribution (AD)

All three groups have little ability of NRW reduction operations technically, particularly leakage detection, because of inexperience. This result indicated necessity of full supports to groups.

5) NRW Action on Commerce (AC)

All three groups have limited ability of NRW reduction operations commercially because of no systematic way based on clear understanding of NRW reduction. This result indicates necessity of full supports to groups.

NRW Management on Distribution

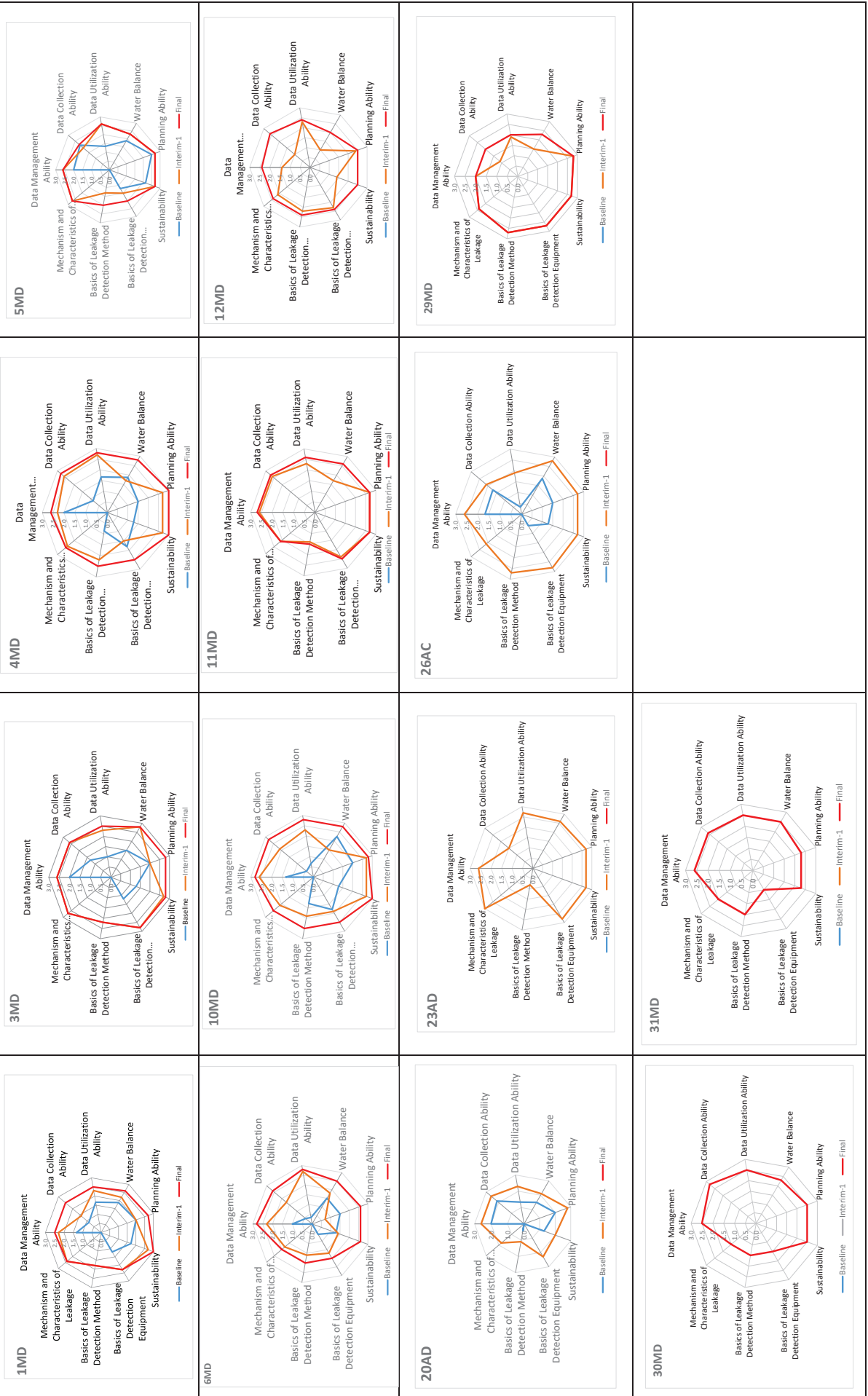


Figure 2-1: Charts of Capacity Development Results at Individual Level (1/3)

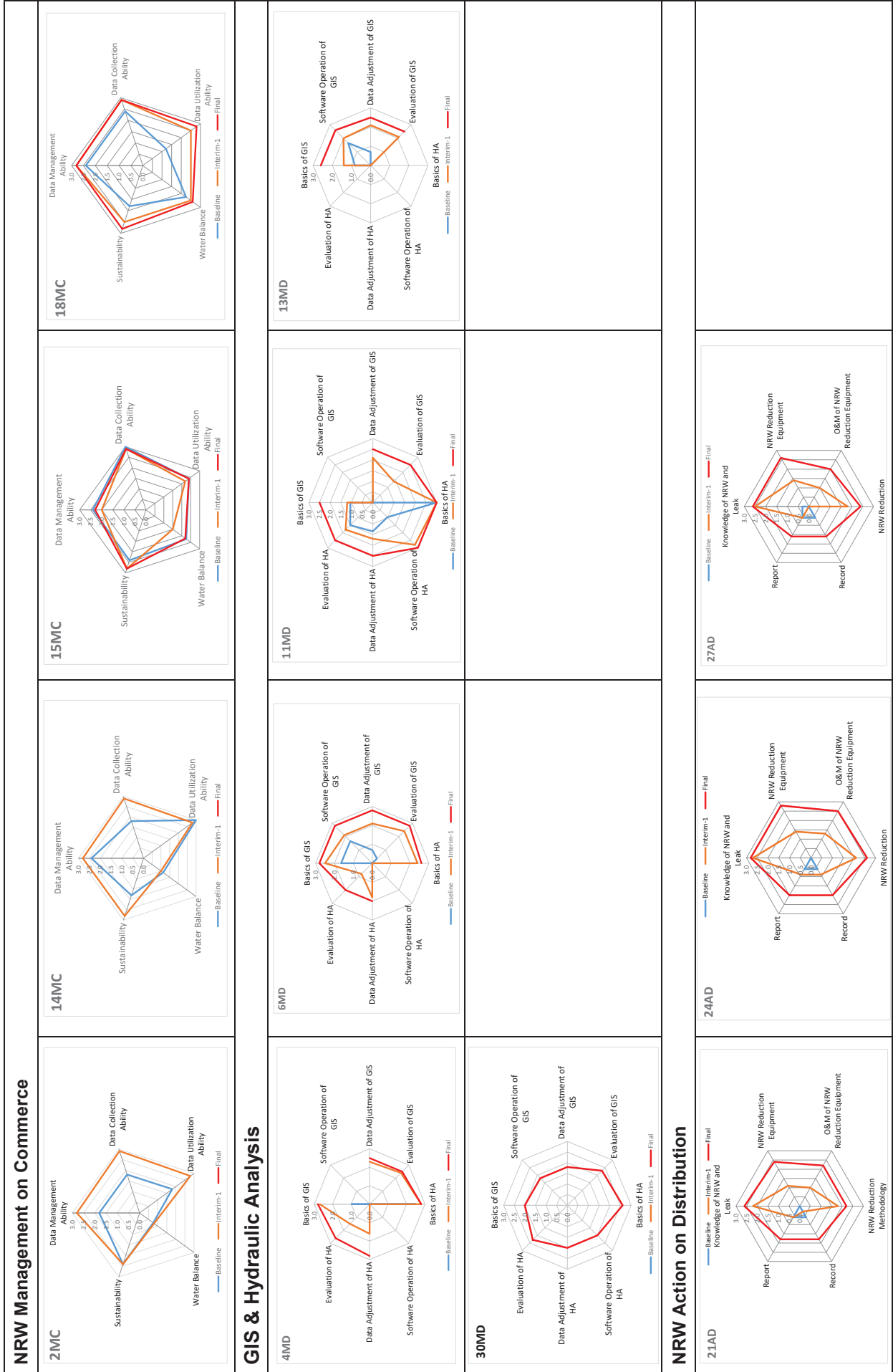


Figure 2-1: Charts of Capacity Development Results at Individual Level (2/3)



Figure 2-1: Charts of Capacity Development Results at Individual Level (3/3)

2.2 Capacity Development Plan at Individual Level

(1) Capacity Development Plan at Individual Level

Based on the result of CAs at individual level, the Project prepared CD plans for individuals in consideration of his/her position, experience and intention through further communication.

The CD plans at individual level are based on the following basic concepts by CA area. Regardless of higher rate as baseline at this time, the Project makes sure of his/her full understanding through practical experience and encourages him/her to keep it or attain higher status with motivation.

1) NRW Management on Distribution (MD)

For distribution (technical) sector in the FCTWB headquarters, the Project aims primarily at development of their capacity of NRW reduction in order to supervise pilot projects and develop medium-term strategic plan for NRW reduction on their own initiative. Secondly, the Project ensures their full understanding and knowledge of data management, collection and utilization, and sustainability to put NRW reduction on a firm basis.

2) NRW Management on Commerce (MC)

For commercial sector in the FCTWB headquarters, the Project aims primarily at development of their capacity of NRW reduction in order to supervise pilot projects and develop medium-term strategic plan for NRW reduction on their own initiative. Secondly, the Project ensures their full understanding and knowledge of data management, collection and utilization, and sustainability to put NRW reduction on a firm basis.

3) GIS & Hydraulic Analysis (GIS&HA)

The Project ensures their capacity for developing GIS database and conducting hydraulic analysis, according to his/her role and responsibility in FCTWB. Off-JT by local organization / professional for GIS operation will be provided. In particular, the Project aims at leadership and acceleration in GIS and hydraulic analysis by the members belonging to Logistic Unit and GIS Unit.

4) NRW Action on Distribution (AD)

For distribution (technical) sector in Area Offices, the Project aims to develop their capacity of NRW reduction operation by using equipment against leakage, to make the operation sustainable, and then to expand their knowledge and techniques into other areas.

5) NRW Action on Commerce (AC)

For commercial sector in Area Offices, the Project aims to develop their capacity of NRW reduction operation against commercial loss such as illegal connections and defective meter, to make the operation sustainable, and then to expand their knowledge and techniques into other areas.

(2) Approaches to achieve Target Capacity

Approaches to achieve target capacity consist mainly of lectures, discussion, presentation, workshops /seminar, OJT and Off-JT including training in Japan for some members. Table 2-4 shows basic strategy of these approaches by CA area.

Table 2-4: Basic Strategy of Approaches to achieve Target Capacity

CA Area		Approach	Frequency/When	By whom
1)	MD	Lectures	Periodically / as necessary	All Experts excluding GIS&HA Expert
		OJT	Routinely	Ditto
		Discussion	Technical meetings /as necessary	Members and Experts
		Presentation	At workshop/seminar, technical meetings	Members
2)	MC	Lectures	Periodically / as necessary	All Experts excluding GIS&HA Expert
		OJT	Routinely	Ditto
		Discussion	Technical meetings /as necessary	Members and Experts
		Presentation	At workshop/seminar, technical meetings	Members
3)	GIS&HA	Lectures	Periodically / as necessary	GIS&HA Expert
		OJT	Routinely	Ditto
		Off-JT (GIS)	TBD	Local company/professional
		Discussion	Technical meetings /as necessary	Members and Experts
		Presentation	At workshop/seminar, technical meetings	Members
4)	AD	Lectures	Periodically / as necessary	Leakage Detection Technology Expert
		OJT	Routinely	Ditto
		Discussion	Technical meetings /as necessary	Members and Experts
		Presentation	At workshop/seminar, technical meetings	Members
5)	AC	Lectures	Periodically / as necessary	Commercial Loss Expert
		OJT	Routinely	Ditto
		Discussion	Technical meetings /as necessary	Members and Experts
		Presentation	At workshop/seminar, technical meetings	Members
All Areas	Workshop/Seminar	Annually	All members and Experts	
	Technical Meeting	Monthly	Ditto	
	Off-JT (Japan)	3 times for some members	JICA (for Management Team, Action Team and Working Group, respectively)	

(3) Monitoring and Evaluation of Capacity Development

As stated in introduction of this document, CD was monitored by an interim and the final assessments. The Project tried to made assessments quantitatively by interview, mini-test, and practical test in consideration of his/her motivation, willingness and contribution.

3 Assessment of Institution, Policy and Society Level

(1) Assessment Method

In principle, institution, policy and society surrounding FCTWB is assessed by means of **Detailed Checklist for Water Supply Entity**, which are a part of “*Handbook for Capacity Assessment on Urban Water Supply Sector and Water Supply Entity in Developing Country (published by JICA)*”.

(2) Selection of Assessment Items

The Project selected the following two items from the Detailed Checklist in terms of aspects of institution, policy and society.

- External influence
- Law, regulation and guideline

(3) Result of Assessment and Approach by the Project

Table 3-1 shows the result of assessment of institution, policy and society level surrounding FCTWB and also approaches by the Project.

A variety of factors affects the Project positively and/or negatively as shown, but in particular, the following factors affect the Project strongly:

- FCTA has governed FCTWB politically, financially and administratively. The Project communicates closely with FCTA and FCTWB to ensure decision making and timely actions, to implement activities smoothly, to introduce incentives, and to make advantages of NRW reduction recognized for future implementation with budget allocation.
- International Development Partners (IDPs) are key players as contributors to urban water sector in Nigeria. The Project communicates closely with IDPs through information sharing, discussions and seminars for further assistance synergistically to FCTWB.
- Establishment of FCTWB as an autonomous organization brings major changes to a water utility. As long as water supply services generate profits, autonomy can contribute to improvement of facilities, O&M and work performance by incentives. The Project communicates closely with FCTA and FCTWB and provides assistance to the extent possible.

Table 3-1: Result of Assessment of Institution, Policy and Society Level surrounding FCTWB

Assessment Items	Content of Assessment	Current Status	Positive or Negative Factor	Approach by the Project
External Influence	Governance and Political Influences	Influence to FCTWB by a board of directors	<ul style="list-style-type: none"> - Decision by the board affects FCTWB positively and/or negatively. 	<ul style="list-style-type: none"> - To communicate closely with FCTWB, and provide assistance to the extent possible.
		Management of Director	<ul style="list-style-type: none"> - Decision and management by Directors affect staff members positively and/or negatively. 	<ul style="list-style-type: none"> - To ensure smooth decision making and timely actions - To encourage them to motivate staff members for smooth implementation.
		Influence to FCTWB by government	<ul style="list-style-type: none"> - FCTA has governed FCTWB in terms of budget allocation, subsidy, income, personnel affairs and promotion. (Counterpart Fund is supposed to be allocated to the Project.) - Federal Government of Nigeria compiles national budget and approve it. - Autonomy of FCTWB is dependent on FCTA and Federal Government of Nigeria. 	<ul style="list-style-type: none"> - Delay in budgetary process influences budget allocation and its disbursement negatively. - Personnel evaluation and promotion affect staff members positively and negatively. - There are little incentives to motivate staff members.
Procurement	Status of procurement procedures	<ul style="list-style-type: none"> - Equipment and materials in common use for O&M such as pipes, fittings and water meters are procured from local suppliers in Nigeria by quotation comparison or tender , according to the FCTWBs procurement procedures. 	<ul style="list-style-type: none"> - A special kind of equipment and materials is not available in Nigeria, so FCTWB has to import it. 	<ul style="list-style-type: none"> - To provide assistance in for example standardization to the extent possible.
	Regulation for registering qualified contractor and suppliers	<ul style="list-style-type: none"> - In conformity with Public Procurement Act 2007, contractor and supplier are qualified. 	<ul style="list-style-type: none"> - Process of qualification, shortlisting and selection of contractor and supplier remains transparent. 	<ul style="list-style-type: none"> - To provide assistance to the extent possible.

Assessment Items	Content of Assessment	Current Status	Positive or Negative Factor	Approach by the Project
Cooperation with IDPs, other Water Utilities, etc.	Contribution by international development partners (IDPs)	<ul style="list-style-type: none"> - Other than the Project, JICA has provided international trainings mainly in Japan for staff members of FCTWB, and will provide renewable source of energy by solar power system at Lower Usuma Water Treatment Plant. - IDPs such as World Bank, AfDB, USAID, AFD have contributed to urban water sector in Nigeria, but no ongoing contributions. 	<ul style="list-style-type: none"> - Capacity development by trainings in Japan affects positively motivation of staff members. - Solar power system will contribute to cost-cutting of fuel and then steady water supply. 	<ul style="list-style-type: none"> - To ensure more effective support through combination with other JICA's schemes. - To communicate closely with IDPs through information sharing, discussions and seminars for further assistance synergistically to FCTWB.
Regulations	Regulation and laws	<ul style="list-style-type: none"> - At national level, Water Supply Act or equivalent doesn't exist, but National Water Policy and National Water Supply and Sanitation Policy exist. - At FCT level, FCTA to which FCTWB belongs is founded on the FCT Act. - FCTWB has an internal regulation. - A Bill of Act to establish the FCTWB as an autonomous organization has been presented to National Assembly. 	<ul style="list-style-type: none"> - Nonexistence of related acts works against raising the level of water supply services. - Establishment of FCTWB as an autonomous organization may affect positively and/or negatively. 	<ul style="list-style-type: none"> - To communicate closely with FCTA, FCTWB and FMWR, and provide assistance to the extent possible. - To provide advice about strengthening or revision of penalty for illegal connections.
Guidelines	Guidelines	<ul style="list-style-type: none"> - At national level, except Nigerian Standard for Drinking Water Quality, guidelines or equivalent of water supply including NRW reduction are not available. 	<ul style="list-style-type: none"> - Nonexistence of guidelines causes inefficiency of O&M, skill retention/diffusion and information sharing, then negatively affect sustainability. 	<ul style="list-style-type: none"> - To communicate closely with FCTWB and FMWR, and provide assistance to the extent possible. - To aim at model case of NRW reduction in Nigeria
Referencing of Water Supply Services Act	Availability of copies of the updated Acts	<ul style="list-style-type: none"> - As stated in the above 'Regulation and laws', Water Supply Act or equivalent doesn't exist. - A copy of A Bill of Act to establish the FCTWB as an autonomous organization is available. 	<ul style="list-style-type: none"> - Nonexistence of related acts works against raising the level of water supply services. 	<ul style="list-style-type: none"> - To communicate closely with FCTA, FCTWB and FMWR, and provide assistance to the extent possible.