United Republic of Tanzania
Ministry of Lands, Water, Energy and Environment (MLWEE)
Zanzibar Water Authority (ZAWA)

THE TECHNICAL COOPERATION PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT OF ZANZIBAR WATER AUTHORITY (PHASE 2)

Final Report

October 2016

Japan International Cooperation Agency (JICA)
NJS Consultants Co., Ltd. (NJS)

GE
JR
16－122

United Republic of Tanzania
Ministry of Lands, Water, Energy and Environment (MLWEE)
Zanzibar Water Authority (ZAWA)

THE TECHNICAL COOPERATION PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT OF ZANZIBAR WATER AUTHORITY (PHASE 2)

Final Report

October 2016

Japan International Cooperation Agency (JICA)
NJS Consultants Co., Ltd. (NJS)

The Technical Cooperation Project for Enhancement of Water Supply Management
Of
Zanzibar Water Authority (Phase 2)

Final Report

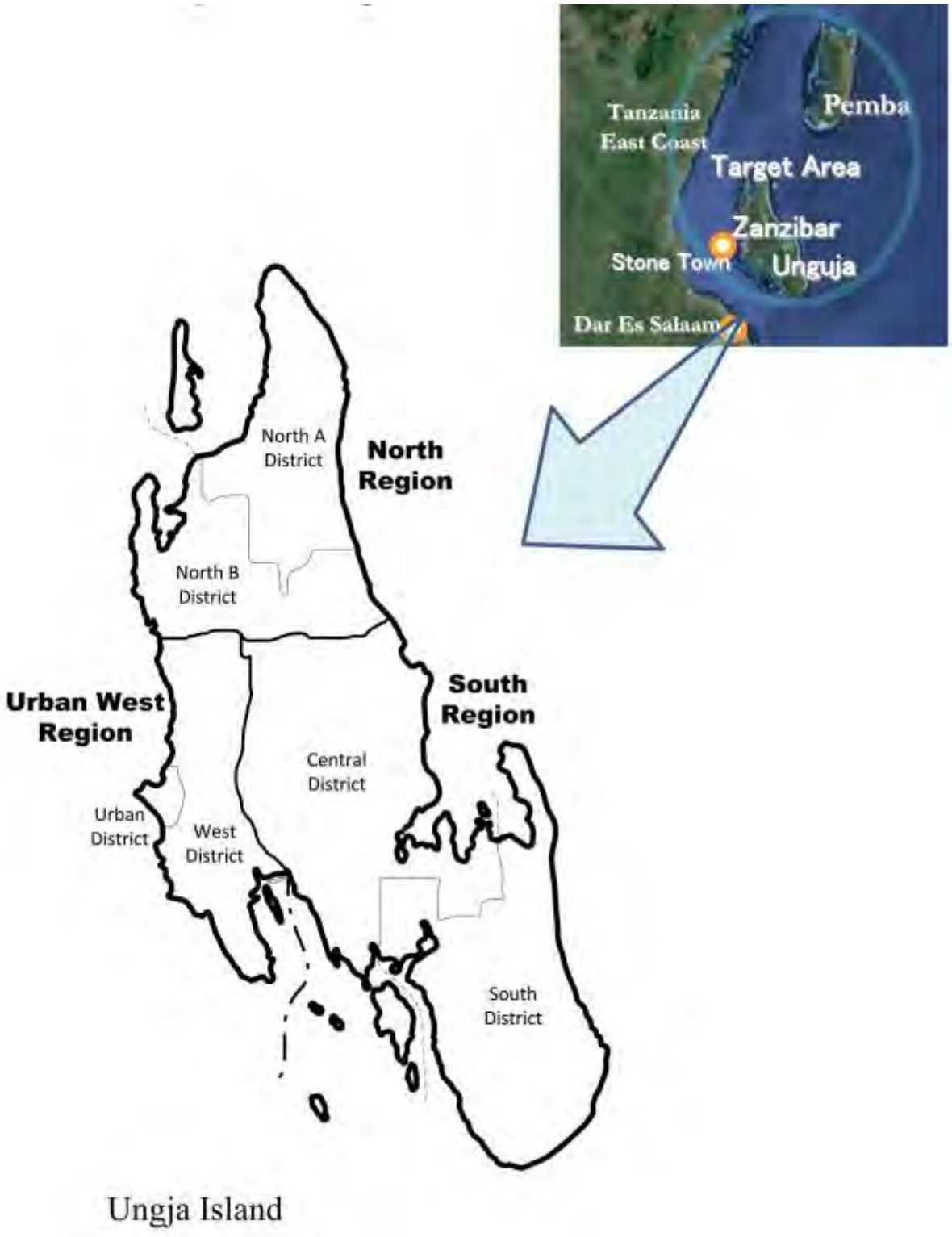
Table of Contents

List of Tables

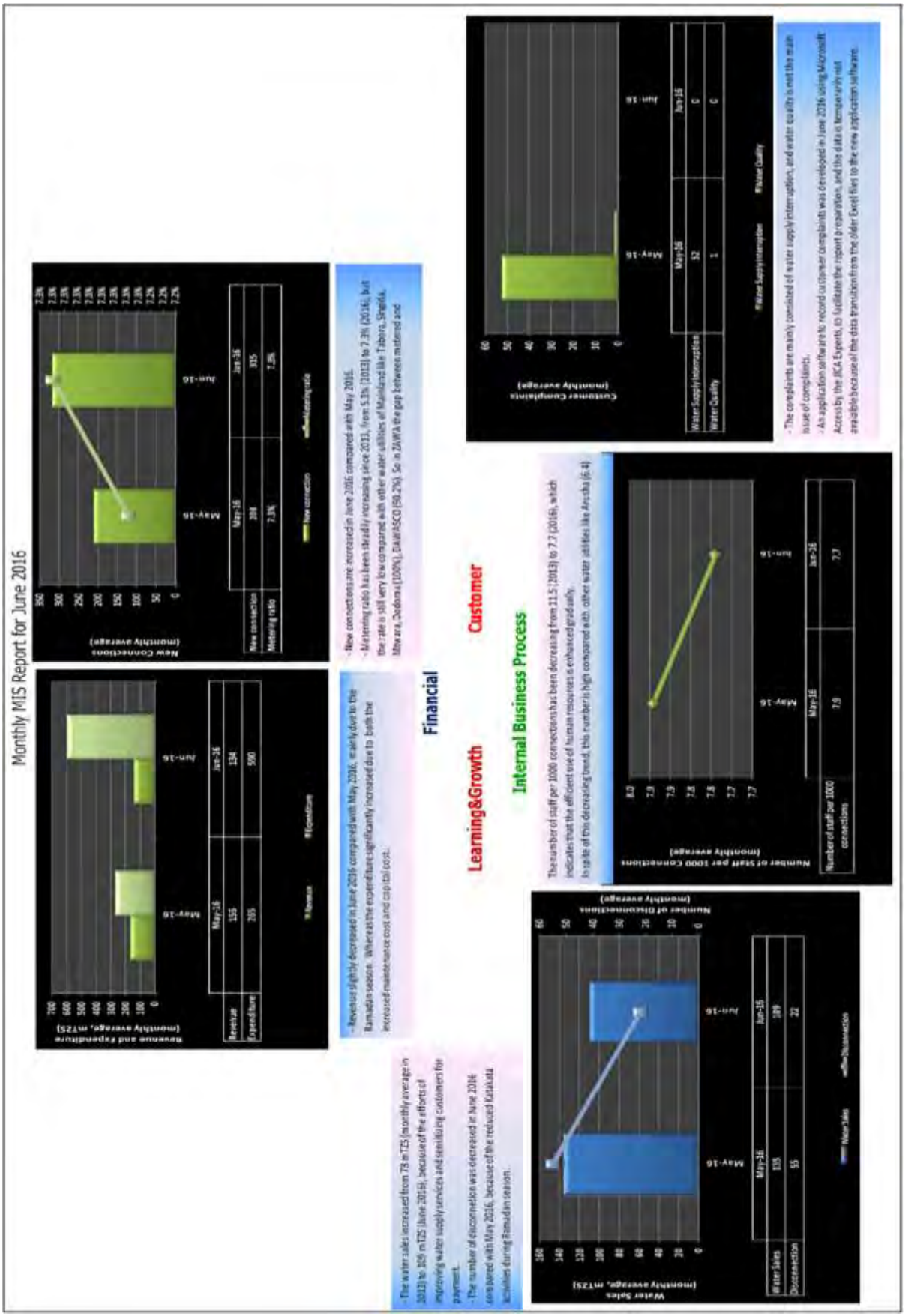
List of Figures

List of Photo

Reference Map and Drawings

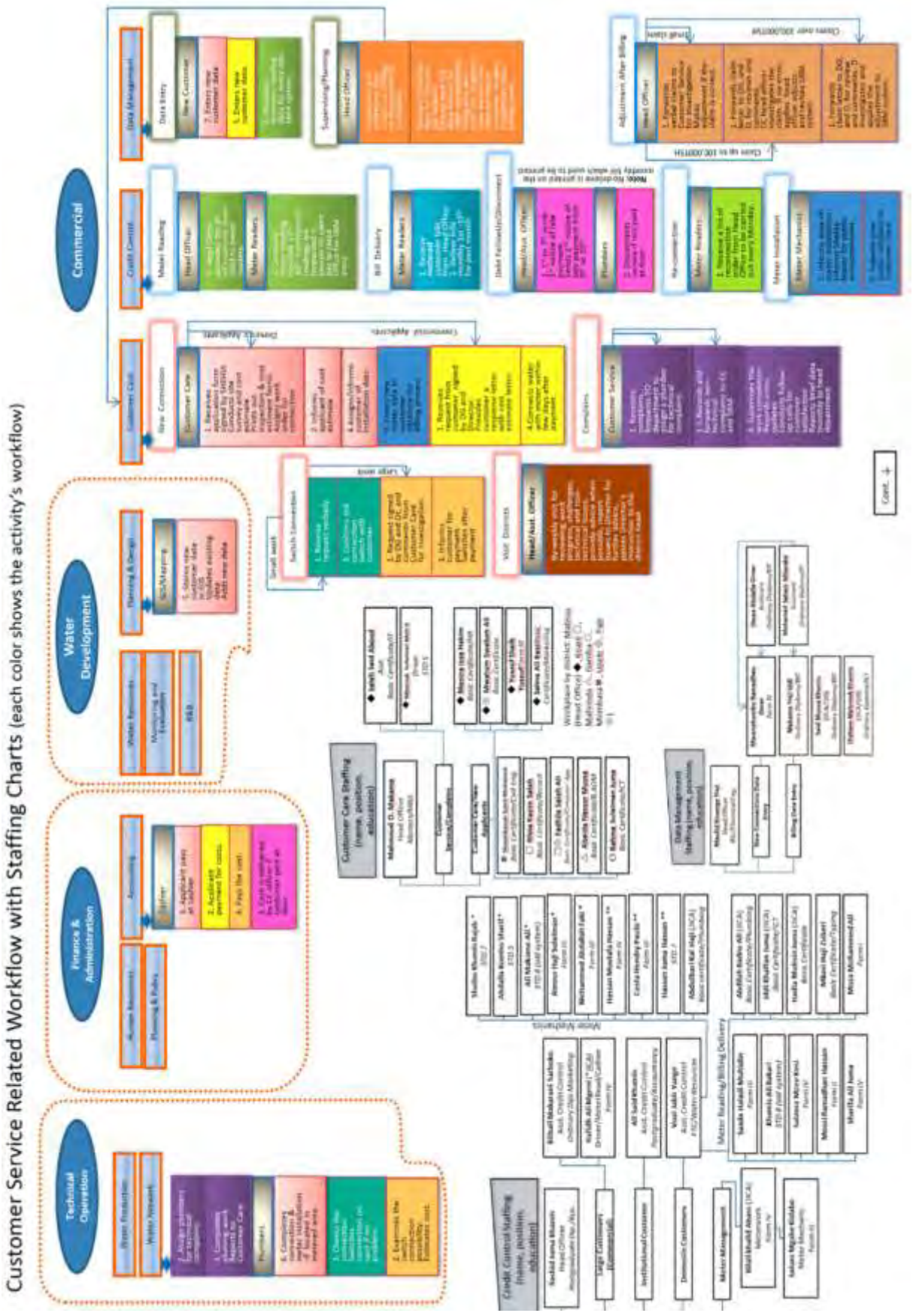


Location map of the Project



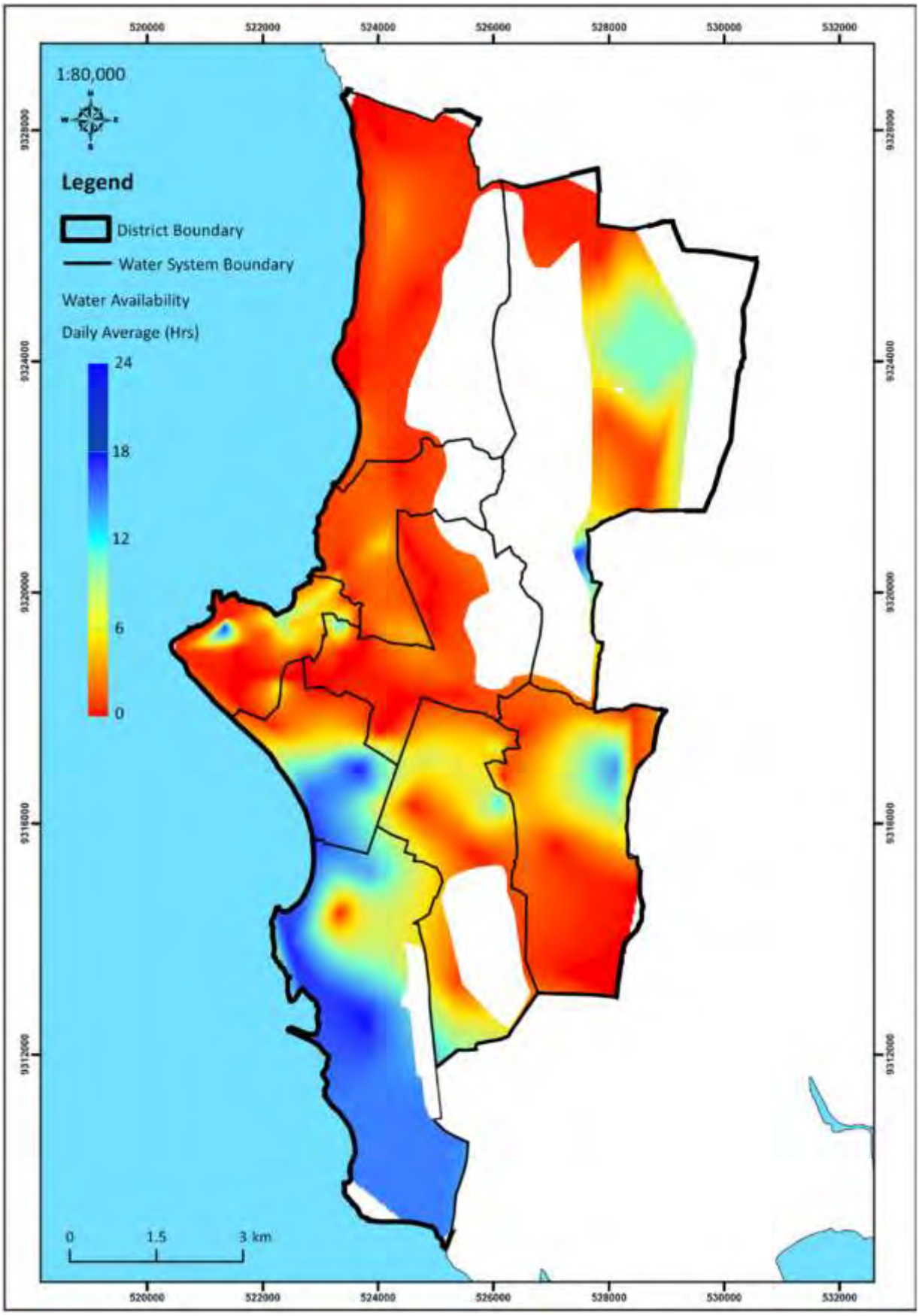
MIS Graph (as of August 2016)

Output-1 (Information Management)



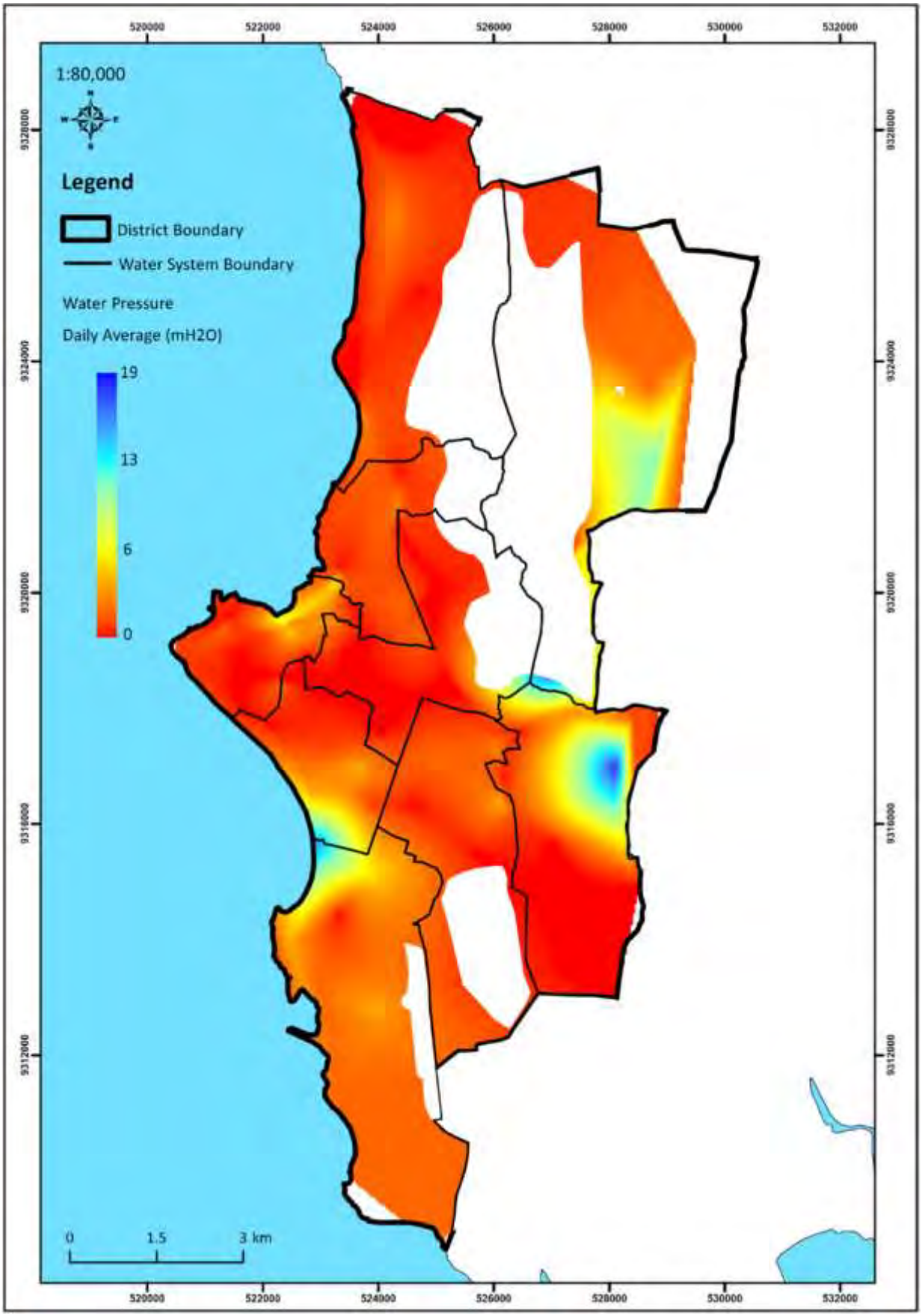
Workflow (Commercial and Customer Service Dep.; as a Sample)

Output-2 (Human Resources Management)



Map of Water Supply Services (average Supply Pressure: mH_2O)

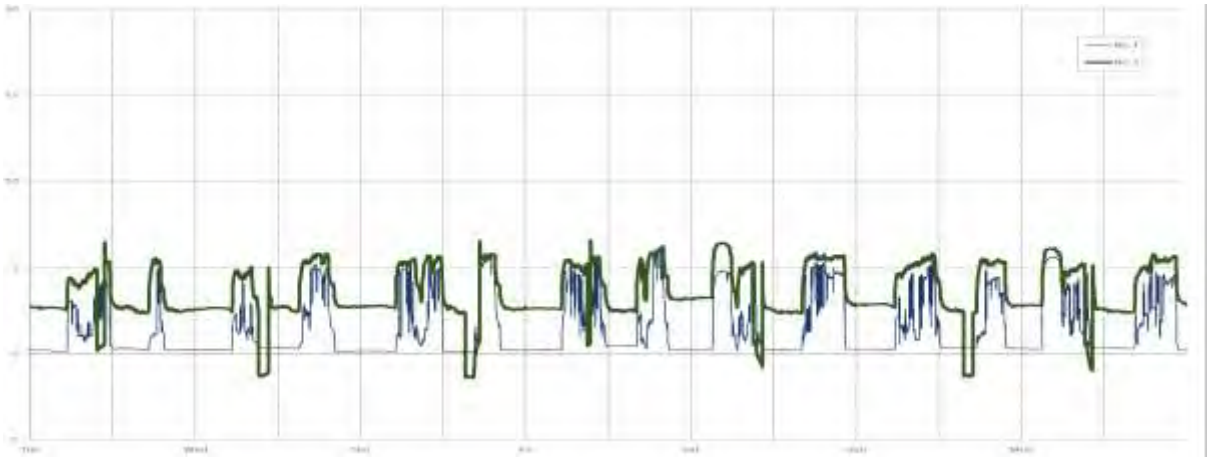
Output-3 (Customer Management)



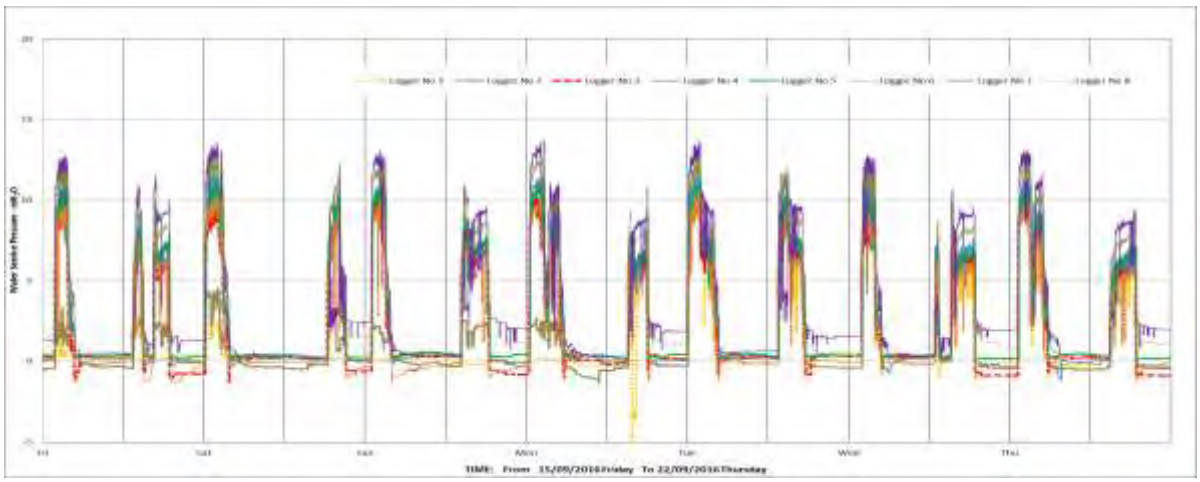
Map of Water Supply Services (daily Supply Hours: hours/day)

Output-3 (Customer Management)

As-built Drawing of Pilot Project at Northern Half of Makadara



Supply Pressure (**before**): 3 to 6 mH_2O at Makadara Shehia on Mar-2015



Supply Pressure (**after**): 8 to 14 mH_2O at Makadara Shehia on Sep-2016

Output-4 (Leakage Management)

Photos: Major Activities

Site Visit by MoFA and JICA: 26-July 2014

Director of MoFA HQs and CR of JICA Tanzania visited Stone Town to see the situation of current water supply. Illegal providers supply contaminated water with full day services by monthly tariff of TZS 20,000 or more.

Training at Jordan: 30-Jan up to 7-Feb 20115

PS of MLWEE, CCD Director and GIS Operator of ZAWA visited Ministry of Water and Irrigation (Training Center) and Amman Provider (Water Laboratory, CCC and SCADA) for expected ZAWA's target in future.

Site Visit by EOJ and JICA: 8-July 2015

Ambassador of Japan to Tanzania and CR of JICA Tanzania Office visited ZAWA's water supply systems. Ambassador made a speech at Makadara (Pilot of ZAWA). Medias (ZNZ TV and ZNZ Leo) reported the said speech favorably.

M/M for R/D revision: 10-Nov 2014

Supervisory Directors of JICA visited MLWEE for signing of the M/M on 10-Nov 2014. Original R/D signed on 25-July 2011 was revised by project purpose of improvement of finance to of management.

Final JCC: 16-Aug 2016

PS as a Project Director of ZNZ side presented;
(1) ZAWA shall keep the demand orientation and
(2) MLWEE shall be responsible for sector monitoring, donor's project and institutional improvement.

Output-1 (Information Management): the 3rd Year

MIS platform was established. Capacity of staff in Planning and Policy Section was improved including target setting and visual analysis. Next step will include MIS expansion and KPI subdivision.

Output-1 (Information Management): the 3rd Year

ICT Committee by CCD and WRD has started to examine B/C of software to be introduced for the streamlining of daily works. The said network will be a core of GIS including additional PC and software for expansion.

Output-1 (Information Management): the 3rd Year

ZAWA procured the 9 sets of personal computers under AfDB loan project and installed them at Water Source Development Centre at Mtoni. OJT of GIS operation was commenced from Aug-2016.

Output-2 (HR Management): the 2nd Year

Attendance system was introduced at ZAWA HQs and District Offices in Unguja. Target of this attendance control is to realize the speedy control of internal activity and the transaction to PDCA training in future.

Output-2 (HR Management): the 3rd Year

Job descriptions were drafted according to workflow of ZAWA. School career, knowledge, skill, work, environment, etc. were added for personal evaluation criteria with due consideration of ZAWA's opinions.

Output-2 (HR Management): the 3rd Year

Histogram analysis of work needs indicated (1) Customer identification, (2) No. of staff, (3) medal system, (4) training system, (5) communication system and (6) IT improvement, (7) penalty system, (8) minimization of work volume.

Output-3 (Customer Management): the 3rd Year

Overall Goals in $PDM_{3\text{-}5}$ are improvement of (1) Water Supply Services and (2) Customer Service upon completion of AfDB project. Baseline survey was conducted by ZAWA C/Ps using Data Loggers in May 2015.

Output-3 (Customer Management): the 3rd Year

ZAWA C/Ps prepare the Baseline Survey in each Distribution System using Data Loggers. Survey method is (1) period of 1 week, (2) visualize the supply pressure by time scale, and (3) numeric the supply pressure and daily hours.

Output-3 (Customer Management): the 2nd Year

Service Connection Survey was commenced from Jan-2014. Household Survey was conducted in the 1st Year. However, customer information could not be connected to promotion activities. This activity is real challenge.

Output-3 (Customer Management): the 3rd Year

Issuers of subscriber contract were clarified through promotion activities, such as; (1) standard services, (2) standard connection, (3) payment conditions, etc. Especially, improved contract is required for apartment house.

Output-3 (Customer Management): the 3rd Year

Meter reading activity uses Smartphone Terminal, which was replaced from Handy Terminal. Progress of meter reading was increased with more than 50%. Expert had checked reading activities by the time in second.

Output-4 (Leakage Management): the 3rd Year

C/Ps team conducted weekly meeting from preparatory works up to the end of document control. However, chief of the team did not attend fully. OJT Civil Expert has been supported to Japanese Expert and ZAWA C/Ps.

Output-4 (Leakage Management): the 3rd Year

Fieldwork of pilot project came to the most important portions such as branch connection of primary pipelines. During this inserting work period of 5 hours, water supply from Saateni Elevated tank is suspended.

Output-4 (Leakage Management): the 3rd Year

Pipeline route between the primary and the secondary in the Pilot Project. Flow monitoring pit was installed on the center pipeline for measuring the minimum night flow. All structures are constructed underground.

Output-4 (Leakage Management): the 3rd Year

ZAWA C/Ps prepared the pipe materials for the secondary pipelines. Skill of any elbow can be processed. Result of pressure test at pipeline installed by HDPE (polyethylene) does not have any leakage.

Output-4 (Leakage Management): the 3rd Year

As a part of quality control, pressure test were conducted with criteria of 30 mH_2O by 1 hour. Pipeline installed by DCIP (ductile cast iron) had leakage at several connections. OJT for pipeline repair was done by Expert.

Output-4 (Leakage Management): the 3rd Year

Manifold (meters will be installed) in the Pilot Project has a cover made of brick structure. Ex-staff of ZAWA made a group of out sourcing of Manifold, Meter installation and service pipeline setting.

Abbreviations

Organization	
AfDB	African Development Bank (Multiple Donor)
EOJ	Embassy of Japan
GOJ	Government of Japan
GOT	Government of Tanzania
IWA	International Water Association
JCC	Joint Coordination Committee
JICA	Japan International Cooperation Agency
JOCV	Japan Overseas Cooperation Volunteers
MLWEE	Ministry of Lands, Water, Energy and Environment (RGoZ)
MoFA	Ministry of Foreign Affaire (Japan)
NJS	NJS Consultants Co., Ltd. (Japan)
OCGS	Office of Chief Government Statistician (RGoZ)
PC	Planning Commission (RGoZ)
RGoZ	Revolutionary Government of Zanzibar
UNDP	United Nations Development Program(Multiple Donor)
UN-Habitat	United Nations Human Settlements Programme (Multiple Donor)
WHO	World Health Organization (International Organization)
ZAWA	Zanzibar Water Authority
ZECO	Zanzibar Electricity Corporation
ZURA	Zanzibar Utility Regulation Authority

Position, Organization with Department and Section	
CA	Chief Advisor (Expert)
BOD	Board of Directors (ZAWA)
CC-C	Credit Control Section, CCD (ZAWA)
CCD	Commercial and Customer Services Department (ZAWA)
C/P	Counterpart (MLWEE/ ZAWA)
CR	Chief Representative (JICA)
CS-C	Customer Services Section, CCD (ZAWA)
CS-F	Corporate Accounts Section, FAD (ZAWA)
DG	Director General (ZAWA)
DM-C	Data Management Section, CCD (ZAWA)
FAD	Finance and Administration Department (ZAWA)
HR-F	Human Resources Section, FAD (ZAWA)
PP-F	Planning and Policy Section, FAD (ZAWA)
PP-W	Planning and Project Section, WDD (ZAWA)
PS	Principal Secretary (MLWEE)
M&E-W	Monitoring and Evaluation Section, WDD (ZAWA)
NO-T	Network Operation Section, TD (ZAWA)
RID-W	Research, Innovation and Dev. Sec., WDD (ZAWA)
SR	Senior Representative (JICA)
TD	Technical Department (ZAWA)
WDD	Water Development Department (ZAWA)
WP-T	Water Production Section, TD (ZAWA)

WRM-W ..... Water Resources Management Section, WDD (ZAWA)

Management and Technical Terms

ABP ..... Annual Business Plan
AC ..... Asbestos Concrete (Pipe)
AC-No. ..... Account Number
BOQ ..... Bill of Quantities
CAPEX ..... Capital Expenditures
CI ..... Cast Iron (Pipe)
DB ..... Date Base
DCI ..... Ductile Cast Iron (Pipe)
DMA ..... District Metered Area
F/S ..... Feasibility Study
GIS ..... Geographic Information System
GS ..... Galvanized Steel (Pipe)
HDPE ..... High Density Polyethylene (Pipe)
HRD ..... Human Resources Development
IC/R ..... Inception Report
ICT ..... Information and Communication Technology
IRR ..... Implementation Rules and Regulations
IT ..... Information Technology
KPI ..... Key Performance Indicator
LMB ..... Leakage Monitoring Block
M/D ..... Minutes of Discussions
MIS ..... Management Information System
M/M ..... Minutes of Meeting
M/P ..... Master Plan
NRW ..... None Revenue Water
ODA ..... Official Development Assistance
OJT ..... On the Job Training
O/M ..... Operation and Maintenance
OPEX ..... Operation Expenditures
PDCA ..... Plan, Do, Check and Action
PDM ..... Project Design Matrix
PE ..... Polyethylene (Pipe)
PIs ..... Performance Indicators
PO ..... Plan of Operation
PR ..... Public Relations
PR-X ..... Progress Report ver-X
R/D ..... Record of Discussions
SA ..... Service Area
SBM ..... Smart Billing Manager
SC ..... Service Connection
SI ..... International System of Units
UPS ..... Un-interruptible Power Supply
uPVC ..... Un-pesticide Polyvinyl Chloride (Pipe)
VPN ..... Virtual Private Network

WBS	Work Breakdown Structures
WATSAN	Water Supply and Sanitation

Unit	
cm	Centimeter
cm/s	Centimeter per second
HHs	Households
kgf	Kilogram force
km	Kilometer
Log	Logarithm
Lpcd	Litter per capita day
Lps	Litter per second
m^2	Square meter
m^3/day	Cubic meter per day
m	Meter
masl	Meter above sea level
mbgs	Meter below ground surface
mbsl	Meter below sea level
mg/L	Milligram per litter
N	Newton: N = 1.01972 × 10-1 kgf
Pa	Pascal: Pa = N/m^2
pH	Power Hydrogen
psi (lbs/in^2)	Pound per square inches
m.mho/cm	Micro ohm-1 per centimeter
Temp.	Temperature
TH	Total Hardness

……

Chapter-1 Introduction

This chapter contains a summary of activities within the overall period of the Project. The series of PDM were revised twice during the project period and this chapter includes the sequence of PDM revision as well. Relation of the activities and outputs in the latest PDM are described in Chapter -2 and Chapter -3.

1.1 Summary of the Project

(1) Background of the Project

Zanzibar of the United Republic of Tanzania is composed of Unguja and Pemba islands including the surrounding islets. In the Unguja Island, as the largest area, piped water supply service for residents in the urban area started first in the 1920's using groundwater sources both wells and springs.

The Revolutionary Government of Zanzibar (hereinafter called as "RGoZ") became independent in January 1965. Department of Water Development (hereinafter called as "DWD") took over claims and obligations of the system, and thus pipelines of 100 km and 7 reservoirs were expanded by 1990. DWD made the free tariff in 1986 according to the Regulation established by the Ministry of Lands, Water, Energy and Environment (hereinafter called as "MLWEE").

DWD does not have enough capacity to systematically maintain and replace the facilities and the water supply services have worsened due to deterioration of the system. Furthermore, financial deficit in MLWEE and inadequate management of DWD affected the system deterioration. Additionally, the customer services had been disappeared coupled with free tariff which was regulated in 1986 by MLWEE.

MLWEE established the Water Policy in 2004 for provision of public water supply services to be fair and sustained. Additionally, MLWEE enacted the Water Act in 2006 for self-reliance of management and finance of DWD together with regulations of duties and services. DWD was authorized as Zanzibar Water Authority (hereinafter called as "ZAWA") and the tariff system was re-started in 2006. MLWEE issued the regulation in 2007 and revised twice at 2008 and 2013.

Under these circumstances and in response to the request of the Government of Tanzania (hereinafter called as "GoT"), the Government of Japan (hereinafter called as "GoJ") implemented a grant aid project, namely "Zanzibar Urban Water Supply Development" from 2006 till 2010 for strengthening the water intake capacity through Japan International Cooperation Agency (hereinafter called as "JICA"). In addition to this, JICA conducted a technical cooperation project called as "Enhancement of Water Supply Management of ZAWA" from 2008 till 2010, which included establishment of the water tariff collection system by ZAWA.

However, many areas were still remained with deteriorated water supply services. High ratio of non-revenue water (hereinafter called as "NRW") has been observed due to deteriorated system and inadequate customer management.

As one of the major places on leakage from the facility, service connection shall be installed by skilled plumber with consideration of quality control such as standardization and licensing system to reduce NRW. Service connection, however, can be placed by the user since the regulation of free tariff was established in 1986 and DWD could not follow up the duty for such NRW reduction. Also, DWD lost the information node between supply provider and user's demand. Consequently, DWD's daily activities were suspended, those are operation and maintenance (hereinafter called as "O&M") to ensure the supply amount, and customer promotion to secure the tariff income.

High ratio of NRW and low ratio of water tariff collection together have negatively impacted the proper operation and the effective management of ZAWA. Therefore, following directions are quite important components to ensure the operational stability of ZAWA's utility management:

- To decrease OPEX by implementing the measures of NRW reduction
- To increase income by strengthening the capacity of customer management

With the above conditions, the GoT requested to the GoJ in August 2010 to provide another technical cooperation project (hereinafter called as "the Project") with an aim to enhance the water supply management of ZAWA.

(2) Sequence of PDM Revision in the Phase-II Project

JICA dispatched the Detailed Planning Survey Team in March 2011. The survey team discussed with Zanzibar and agreed on the frame of Phase-II Project (hereinafter called as "PDM"). As a result of the above discussions, the record of discussions (hereinafter called as "R/D") was made and officially signed on the 25th day of July 2011 by both sides. JICA decided to implement the Phase-II Project by duration of 4 years from November 2011 to October 2015.

Negative chain has been standing between ZAWA and customers (see Figure 1-01). By the past assistances from the donor, it was believed that physical service could be qualified by financial improvement through proper management and O&M activities. Unfortunately, both service quality and tariff income have not been improved for a long period. The Team recognized the role of the Project is to propose and implement the operation procedures to break off the negative chain.

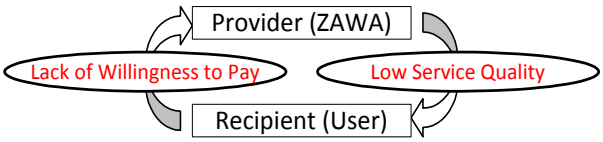


Figure 1-01 Image of Negative Chain on ZAWA's Utility Operation and Management

In the 2nd fieldwork, the Team considered that PDM was needed to be revised. As the first step of the PDM revision, an stakeholder analysis was conducted with the core problem of "Service Improvement." Based on the clarification of stakeholders, ZAWA is identified as the solo water supply provider in Zanzibar. Accordingly, the activities were subject to (1) avoidance of increasing the subsidies from the RGoZ, (2) retention of customer oriented services, and (3) consideration of directions in long-term management. In addition to this, the priority shall be given to the phased improvement of service quality. The Team recognized that the customer satisfaction with demand orientation and sustainable activity with balance of service provision and benefit acquisition are required for ZAWA.

JICA fielded the team of joint mid-term review (hereinafter called as "JMTR") in September 2013. Revision of PDM_1 proposed by the Team was recognized as necessity by the Joint Coordination Committee (hereinafter called as "JCC") then PDM_1 was replaced by PDM_2.

The Team has discussed continuously with concerns after replacement by PDM_2 in the 2nd year for better direction of the project activities. To achieve the improved service quality of the overall goal in PDM_2, the Team proposed to complete the ZAWA's NRW reduction project smoothly under AfDB loan. Concerns of both sides had understood that revision of PDM_2 was needed. JICA dispatched the consultation mission twice in September and November 2014, and minutes of meeting (hereinafter called as "M/M") for revision of R/D was signed by both sides on the 10th day of November 2014. Summary of each PDM with period is shown as Table 1-01.

Outline of the Project is referred below according to the latest $PDM_{3\text{-}5}$.

Project Period:	November 2011 until October 2016 (originally 4 years but was extended to 5 years)
Project Area:	Unguja, Zanzibar
Target Group:	ZAWA Staff in Unguja Island

Overall Goal: ZAWA's water supply services are improved.
Project Purpose: ZAWA's management capacity through NRW reduction activities is improved.
Output: 1. ZAWA's capacity of information management is enhanced.
2. ZAWA's capacity of human resources management is improved.
3. ZAWA's capacity of customer management is improved.
4. ZAWA's capacity of leakage management is enhanced

Table 1-01 Summary of Each PDM Revised

Summary	PDM_1	PDM_2	PDM_3
Overall Goal	Improvement of Service Quality (OPEX becomes smaller than tariff income)		Improvement of Service Quality (in terms of services on water supply pressure and daily hours, and customer orientated)
Project Purpose	Improvement of Financial Conditions (improvement of recovery ration and financial balance)		Improvement of Management Capacity (implementing of NRW reduction project and budgetary allocation by NRW activities)
Output-1	Strengthen the Management Capacity (improvement of KPIs)	Strengthen the Management Capacity (annual planning and implementing)	Enhancement of Information Management (monthly MIS with effective analysis and budgetary management using ABP)
Output-2	Improvement of Tariff Collection Ratio (more than 30 %)	Improvement of Tariff Collection Ratio (increasing the amount of billing and collection)	Improvement of HR Management (organization restructuring with staff allocation and amendment of staff rule and regulations)
Output-3	Strengthen the Planning Capacity of NRW Reduction Activities (annual and mid-term plan)	Strengthen the Planning Capacity of NRW Reduction Activities (mid-term plan)	Improvement of Customer Management (promotion, meter reading and billing ratio)
Output-4	Strengthen the Implementing Capacity of NRW Reduction Activities (reduction of NRW ratio)	Strengthen the Implementing Capacity of NRW Reduction Activities (capacity development)	Enhancement of Leakage Management Capacity (pilot project, donor project and capacity development for NRW reduction)
Period	1 year and 10 months Nov.11,2011 to Sep.20,2013	1 year and 2 months Sep.20,2013 to Nov.10,2014	2 years Nov.10,2014 to Oct.31,2016

Note: Descriptions of verifiable indicator are put in parentheses briefly.

(3) Operation Period of the Project

Final Report (hereinafter called as "F/R") covers the entire period of the Project from November 2011 until October 2016. The fieldwork periods were newly divided for effective Progress Report (hereinafter called as "P/R"). Actual fieldworks are indicated in Table 1-02.

Table 1-02 Period of Fieldworks with Outputs

Fieldworks in the 1st R/D and Period*1 ("Fieldwork" is shortened as "FW")		Original Phasing		Final Phasing	
		FW	Output	FW	Output
1st	Nov 2011 to Mar 2012:5 months	1st	IC/R and PR-1	1st	IC/R, PR-1 to PR-3
2nd	Apr 2012 to Mar-2013:12 months	2nd	PR-2 and PR-3		
3rd	Apr 2013 to Mar 2014:12 months	3rd	PR-4 and PR-5	2nd	PR-4 to PR-5
4th	Apr 2014 to Mar 2015:12 months	4th	PR-6 and PR-7	3rd*2	PR-6 to PR-8, Work Plan
5th	Apr 2015 to Oct 2015:7 months	5th	F/R		
Extension	Nov 2015 to Oct 2016: 12 months	R/D: signed on 20 Aug 2015			PR-9 and F/R

(Note) *1: First month of fieldwork was allotted to contract works; *2: Extension period was included into the 3rd fieldwork.

(4) Evaluation of Activities and Achievement Performed

JICA dispatched the mission team three times and the consultation team three times also as shown in Table 1-03. Representative from JICA Tanzania Office was dispatched for JCC meeting of each P/R.

The JMTR in September 2013 recognized to revise PDM. General evaluation was concluded that communication between Zanzibar side and the Team was improved dramatically. On the other hand, the mission team evaluated that it was too early to judge the achievement of each output just after the revision of PDM.

Table 1-03 JICA Mission and Consultation Teams

Purpose and Schedule		Mission Member	Field Report
1st FW	Consultation Dec.03-Dec.12, 2012	Leader Expert Coordinator	・ ZAWA's coordination between AfDB-JICA was not enough. Recommendations were (1) allocation of C/Ps, (2) organization restructuring/ annual business plan and (3) increasing the amount of intake
2nd FW	JMTR Sep.03-Sep.21, 2013	Leader Coordinator Consultants	・ Cause analysis for PDM was not enough. PDM was revised. ・ ZAWA's coordination between donors was not enough. PDM was revised. ・ Communication was improved drastically.
3rd FW	Consultation Nov.9-Nov.10, 2014	Supervising Director Ass-SV Director	・ M/M to revise R/D for modified Project Purpose of PDM Financial Improvement was replaced by Service.
	JTE-1 May13-Jun.02, 2015	Supervising Director Coordinator Consultants	・ ZAWA's procurement of materials was delayed. Recommendation to extend 1 year. ・ Recommendation of ZAWA's actions to taken in the extension period.
	Consultation Aug. 20, 2015	Chief Representative	・ M/M to revise R/D for the Project period up to Oct 2016
	JTE-2 Aug.11-Aug.17, 2016	Leader Coordinator	・ Partially achieved and others were on progress. Continued activities to the previous recommendation in May 2015.

The JTE-1 in June 2015 evaluated that the pilot project as one of activities in Output-4 (Leakage Management) was not achieved due to delay of material procurement by ZAWA. The JTE recommended extension of the project period on condition that ZAWA promised to implement the following actions steadily:

- Management of ZAWA: ZAWA management shall prepare the strategic vision and project formulation with effort to the financial improvement.
- Cost vs. Benefit Analysis: ZAWA shall analyze the financial balance by benefit per cost of the pilot project, and then utilize the result for future management.
- Staff Allocation: ZAWA shall improve the staff allocation of counterparts for concentration of the pilot project activities.
- Organization: ZAWA shall promote the structural revision proposed by C/Ps and the Team for approval and implement it immediately.
- NRW Team: ZAWA shall create the NRW Team to promote the NRW reduction activities for concentration of input resources.
- Utilization of MIS: ZAWA's Board shall understand the MIS report and utilize it for proper operation of ZAWA.
- Board of Directors: ZAWA's Board shall accept to include the Team`s participation to Board Meeting for opinion exchange with the Team.

ZAWA's Director General (hereinafter called as "DG") presented the action plan of ZAWA towards the recommendations from the JTE at the bi-lateral meeting between Tanzania and Japan conducted at Dar Es Salaam in August 2015. Extension of the project period was approved on condition that (1) the action plan shall be implemented immediately and (2) ZAWA shall report the progress monthly about implementing of the action plan according to the presentation of DG.

At the terminal period of the project extension in August 2016, JICA dispatched the 2nd mission of JTE. The mission team concluded the results shown in Table 1-04 and recommended the following measures for realization of effective impacts through the PDM activities.

Table 1-04 Project Evaluation by JICA JTE-2 Mission

Outputs with Verifiable Indicators		Performance
Output-1: ZAWA's capacity of information management is enhanced.		
1-1	MIS report is compiled on monthly basis and utilized by the management of ZAWA.	Partially achieved
1-2	ZAWA's ABP is prepared and utilized for budget management for leakage reduction activities under JICA Technical Cooperation.	Partially achieved
Output-2: ZAWA's capacity of human resource management is improved.		
2-1	Revised organization structure is approved by ZAWA board.	On progress
2-2	Amendment of staff rules and regulations is approved by ZAWA board.	Achieved
Output-3: ZAWA's capacity of customer management is improved.		
3-1	All customers (approximately 9,400 HHs) in Model System are newly registered into SBM-GIS.	On progress
3-2	Meter reading number per party in Model System is improved from 200 to 400 HHs/month.	Achieved
3-3	The billing ratios in the Pilot Area are improved.	Achieved
Output-4: ZAWA's capacity to plan and implement leakage reduction activities is enhanced.		
4-1	Preliminary plan on leakage reduction is incorporated to ABP.	Achieved
4-2	ZAWA reflects operating procedure in Pilot Area to the design report for ZAWA's Project under the other donor loan.	Achieved
4-3	ZAWA staff members become qualified in conducting.	On progress

[Recommendations based on the PDM progress]

- Project Purpose: In order to become financially independent, ZAWA should continue to implement and expand the NRW reduction activities, especially by allocating more staff and budget for customer management.
- Output-1: ZAWA needs to develop long-term, mid-term and annual business plans by analyzing the current situation using MIS. The RGoZ (MoFP and MLWEE) is expected to support ZAWA to have necessary budget to conduct daily activities to become financially independent.
- Output-2: ZAWA and MLWEE are expected to ensure early approval of the Scheme of Service by the Public Service Commission of the President's Office. ZAWA should revise its organizational structure and staff allocation to enable it to sustainably continue project activities.
- Output-3: ZAWA should update the database in the Smart Billing Manager 2 (hereinafter called as "SBM-2") and continue capacity development activities especially for meter reading. ZAWA should also facilitate better communication among the relevant sections. ZAWA and MLWEE should secure sufficient budget and staff for customer management.
- Output-4: ZAWA should complete the Pilot Project and sustain the skills

and knowledge of the Pilot Project team using every opportunity such as AfDB Loan Project. ZAWA should authorize the Technical Standards and the Standard Procedure of Leakage Reduction.

[Recommendations based on the progress of the activities suggested in JTE in May 2015]

- Management of ZAWA: It is the same with the recommendation of Output-1 above.
- Cost vs. Benefit Analysis: ZAWA shall complete to analyze the financial balance by benefit per cost of the pilot project and then utilize the result for future management.
- Staff Allocation: ZAWA shall continue realizing the recommendations for Outputs-1/ -2/ -3 above.
- Organization: It is the same with the recommendations of Output-2 above.
- NRW Team: In addition to above, ZAWA shall create the NRW Team.
- Utilization of MIS: It is the same with the recommendation of Output-1 above.
- Board of Directors: MLWEE, ZAWA and JICA should maintain close communication to monitor the sustainability of the Project activities and to follow up the recommendations.

1.2 Input of the Experts

Table 1-05 shows the input expert.

Table 1-05 Sectoral Composition of Input Experts by Fieldwork Periods

Field of Task*1	The 1st Fieldwork	The 2nd Fieldwork	The 3rd Fieldwork
Chief Adviser/ NRW-1	Nobuyuki Gonohe	Nobukatsu Sakiyama	Nobukatsu Sakiyama
Depty Chief Adviser/ Utility Management-1	Toru Suetake	-	Toshihiko Tamama
Utility Management-2	-	Takehiko Ogawa	Hideyuki Takagi
Utility Management-3	-	Toshihiko Tamama	Natsuki Shimegi
Utility Management-4			Masouleh Fatemeh
Utility Management-5	-		Rie Yamaguchi
Customer Management-1	Hideyuki Takagi	Hideyuki Takagi	Masaomi Oota
Customer Management-2	Nobuyuki Aoki	-	Nobunari Shinohara
Customer Management-3	Yoko Miura	-	Ken Takeuchi
Customer Management-4	Takashi Watanabe	Takashi Watanabe	-
Leakage Detection	Kiyoshi Kiyama	Kiyoshi Kiyama	Kiyoshi Kiyama
GIS-1	-	Kazumi Suwabe	-
GIS-2/ NRW-2	Shusaku Ueno	Toshiaki Ooka	Toshiaki Ooka
GIS-3/ NRW-3	Takanori Nemoto	Hideaki Takahashi	Hideaki Takahashi
GIS-4/ NRW-4	Masumi Tsuyuki	Yukio Kemi	Yukio Kemi
GIS-5/ NRW-5	Naoto Koike	Naoto Koike	Naoto Koike
OJT-Institution	-	-	Alexander Nkwamah
OJT-Finance	-	-	Poncian Bengesi
OJT-GIS	-	Francis Murathi	Francis Murathi
OJT-Civil	-	Modhakkiru Katakweba	Modhakkiru Katakweba
OJT-Piping-1	-	-	Samson Babala
OJT-Piping-2	-	-	Damian Ngeduke

Note*1: Task name is different from the actual assignment for simple comparison of the experts.

After the 2nd fieldwork, total of input experts with grouped tasks by each output is shown in Table 1-06. It is noted that input number of expert is different from the number of experts because of multi-task assignment.

- Management Group: 2 experts
- Output-1 (Information): 4 experts
- Output-2 (HR): 3 experts
- Output-3 (Customer): 9 experts
- Output-4 (Leakage): 7 experts

Table 1-06 Indicators of Input Experts (International and National)

Indicator		The 1st Fieldwork	The 2nd Fieldwork	The 3rd Fieldwork
Duration Month of the Fieldwork		17	12	31
Input No. (man-month)	International	30.89	31.31	90.57
	National	0.00	4.00	95.00
	Total	30.89	35.31	185.57
Input Ratio (man/ month)	International	1.82	2.61	2.92
	National	0.00	0.33	3.06
	Total	1.82	2.94	5.99

1.3 Concept of the Activities and Achievement of the Previous PDM

(1) Basic Concept of the Activities

Style of "Plan-Do-Check-Action (hereinafter called as "PDCA")" was adopted for the activity in the 1st field work.

Activities commenced from the draft planning were not connected to the capacity development of ZAWA C/Ps without understanding the reason of planning ahead, which was prepared by the Team in accordance with the PDCA order. Additionally, the draft plan prepared by the Team could not be modified by ZAWA C/Ps with due consideration of local characteristics. As a result of this activity, C/Ps have kept the guidelines such as "Stock Management," "Human Resources Management," etc. on their desks without use.

The Team changed the style of activity on PDCA by on the job training (hereinafter called as "OJT"). This activity included that preparation, fieldwork, recording, analyzing up to planning jointly by C/Ps together with the expert. Following progress could be observed in each output.

Output-1 (Information):	Preparation of MIS Platform with Collection, Analysis and Division of KPIs with Definition, Preparation of ABP and AR Platform, ICT Expansion Planning, etc.
Output-2 (HR):	Preparation of Organogram Restructuring and Staff Allocation, Training Needs Assessment and Planning, Identification of Workflow with Duty, Preparation of the Scheme of Services, etc.
Output-3 (Customer):	Service Connection Survey, Preparation of Guideline of Customer Management, Customer Promotion, Meter Reading and Billing Works, Public Relation, Sector Monitoring, etc.
Output-4 (Leakage):	Preparation of Systemization Materials for AfDB Project, Preparation of Standard Drawings and NRW Reduction Procedures, Management of AfDB Project, Preparation and Implementation of Pilot Project, etc.

Input of expert was increased due to change of the style of activities from PDCA to OJT (see Table 1-04). The Team understands that, upon completion of the OJT with capacity development successfully, PDCA should be applied as a next step with due consideration of capacity level of ZAWA.

(2) Achievement Performed in the Previous PDM

Major activities and achievement performed in PDM_1 and PDM_2 are summarized in Table 1-07.

Table 1-07 Achievement Performed in the PDM_1 and PDM_2

Outline of PDM	PDM_1 (setup on Jul-2011)	PDM_2 (revised on Sep-2013)	Remarks
Overall Goal: Service Improvement	・ Not Achieved	・ Not Achieved	・ Concept Change to OJT
Project Purpose: Financial Improvement	・ Not Achieved	・ Not Achieved	・ Finance is followed after service.
Output-1: Management Capacity	・ MIS: 7 KPIs were defined. ・ Organization: staff allocation was proposed.	・ OJT to divide KPIs ・ Monitoring indicators of PDM activities by OJT	・ PDM_1: Suspended ・ PDM_2: Cooperated with AfDB Project
Output-2: Tariff Collection Ratio	・ Household survey was conducted to identify the all customers but billing work was not worked.	・ OJT of the service connection survey was commenced.	・ OJT work for demand orientation was recognized.
Output-3: Planning Capacity of NRW Reduction	・ NRW Definition: IWA Balance was explained. ・ Advise to prepare the annual plan on NRW reduction.	・ Preliminary design of systemization was commenced. ・ Commence the OJT of pilot project.	・ Selection of the Consultant for AfDB was commenced. ・ OJT of Pilot Project
Output-4: Implementing Capacity of NRW Reduction	・ Pilot areas at 3 ・ Procurement and installation of meters ・ Design the zoning work ・ Training on piping work	・ ZAWA commenced the water supply suspension ・ Pilot area at 2	・ Relation of AfDB and Pilot projects ・ ZAWA accepted to procure the materials for Pilot.
JCC Meeting	・ The Team presented the activities according to PDCA.	・ C/Ps presented the progress of OJT. ・ The Team advised to C/Ps.	・ Acceptance of OJT
TOR Change	・ Merge the 2 fieldworks ・ Additional Contact-out: Household Survey	・ Input the expert to Outputs-3/ -4 for AfDB Project	・ January 2013 ・ January 2014

……

Chapter-2
Activities and Achievement Performed

The conducted activities and achievement based on the latest PDM_3 shall be summarized in this chapter, together with the other activities which are related to the outputs. The activities that were launched based on the older versions of PDM and were continued after the PDM_3 shall be also included.

2.1 Outputs and Activities of $PDM_{3\text{-}5}$

The outputs and the corresponding activities defined in the latest version of the PDM, which is $PDM_{3\text{-}5}$, are summarized in Table 2-01.

Table 2-01 Outputs, Activities and Verifiable Indicators of $PDM_{3\text{-}5}$

Outputs and Activities		Verifiable Indicators
Output-1: ZAWA's capacity of information management is enhanced.		• MIS report is compiled on monthly basis and utilized by the management of ZAWA. • ZAWA's ABP is prepared and utilized for budget management for leakage reduction activities under JICA Technical Cooperation.
1-1	Define KPIs of WUM and monitoring indicators of activity in PDM, and collect and analyze them monthly.	
1-2	Establish MIS for comparison of KPIs in ZAWA and other utilities.	
1-3	Strengthen the budgetary control through planning of "NRW reduction activities in UWS" which will be incorporated into the ABP.	
Output-2: ZAWA's capacity of human resources management is improved.		• Revised organization structure is approved by ZAWA board. • Amendment of staff rules and regulations is approved by ZAWA board.
2-1	Develop a revised organization structure with transitional plan.	
2-2	Propose plan for improving recruitment, allocation and management of staff in ZAWA HQs and District Offices.	
2-3	Review the training policy, prepare and implement yearly staff training program.	
2-4	Review and propose amendment of staff rules and regulations.	
Output-3: ZAWA's capacity of customer management is improved.		• All customers (approximately 9,400 HHs) in Model System are newly registered into SBM-GIS. • Meter reading number per party in Model System is improved from 200 to 400 HHs/month. • The billing ratios in the Pilot Area are improved as follows. - Ratio of billed customers: 95% as target - Ratio of billed amount: 98% as target
3-1	Register all households in UWS and customers in the Model System into SBM-GIS and update them.	
3-2	Improve the existing bill collection guideline.	
3-3	Improve billing activities (from meter-reading to invoicing) within the Model System.	
3-4	Enhance public relations to increase the sales of water.	
3-5	Prepare the tariff revision roadmap that reflects cost-benefit analysis of NRW reduction activities in the Model System.	
Output-4: ZAWA's capacity to plan and implement leakage reduction activities is enhanced.		• Preliminary plan on leakage reduction is incorporated to ABP. • ZAWA reflects operating procedure in Pilot Area to the design report for ZAWA's Project under the other donor loan. • ZAWA staff members become qualified in conducting: - leakage detection: 2 persons - pipe placement/ repair: 10 persons - service connection: 4 persons - construction quality control: 2 persons
4-1	Conduct surface leakage survey in UWS and pipeline repair in Pilot Area.	
4-2	Prepare the standard drawings of piping works as a part of ZAWA's Technical Standards.	
4-3	Formulate an operating procedure composing of surface leakage reduction and zoning works (DMA and LMB) in the Pilot Area, and replace pipelines and install water meters.	
4-4	Design the draft project monitoring plan for the Model System and monitor leakage reduction works.	
4-5	Encode information of distribution facilities, survey results and construction records in GIS.	
4-6	Coordinate NRW/ leakage reduction projects assisted by other donors.	

The progress of the activities listed in Table 2-01 (previous page) were monitored based on the workflow prepared for each output (refer to the Chapter 4. 4-1 (2)). In addition, the priority among the four outputs were set as to put Outputs-3 and -4 as the first and concurrent priority, followed by the Output-1 and subsequently by the Output-2 to ensure the sustainability of all the activities. For example, aiming to reduce the expenditure through the NRW reduction of Output-4, improvement of distribution facilities and quality control of service laterals were launched with an aim to increase the revenue through the customer management of Output-3, and launching the identification of customers up to the delivery of bills to them concurrently as the first priority works. These activities were followed by the monthly progress monitoring in the information management of Output-1, and subsequently were ensured to be sustainable through the organization reform and the staff reallocation in the human resources management of Output-2.

2.2 Management Activities for the Project

The detailed specifications of the Project are seen Table 2-02 such as the management activities of the Project, the submittal of initial plan and progress report, the cooperation with dispatched team by JICA, and the coordination for regular meetings. The Team conducted the necessary activities according to the contract in cooperation with the concerned personnel of Japanese side.

In addition, the Team conducted the following other activities: (a) assistance of site visit to JICA and MoFA personnel; (b) reception of JICA personnel i.e. the OJT trainees, the internship staff, the internship university student by JICA program and the personnel of Yokohama Waterworks Bureau dispatched under the scheme of JOCV; (c) the coordination for training program in Japan, third country training and ABE initiative.

Table 2-02 Summary of Project Management Activities

Activity	Synopsis	Detailed Activity
Initial Plan	・ After the conclusion of annual contract ・ After the revision of PDM	Submitted the plans to the concerned parties according to the contract.
JICA mission	・ Intermediate Evaluation ・ Terminal Evaluation ・ Revision of R/D ・ In-time Inspection	・ Preparation: fixing the date and cooperation with pre-dispatch meeting ・ Arrangement: coordination with Tanzania side and reception of the mission team; cooperation with the mission team, documentation and explanation
Report	・ Initial plan ・ IC/R (Work Plan) ・ P/R and F/R	Submitted the reports to the concerned parties according to the contract.
JCC	・ Report ・ Other mission	ZAWA and the Experts reported to MLWEE, JICA and Ministry of Finance and Planning the activity, progress and result when submitting the reports. The Experts escorted the JICA mission team for yen loan.
Site visits	・ JICA ・ MoFA	Mainly received the visitors below: ・ JICA: Tanzania Office, HQs (Global Environment Division, Africa Region Division etc.) ・ MoFA: Embassy of Japan, Department of Economic Cooperation etc.
Trainees	・ Trainees of JICA ・ JOCV of local government	Received the trainees and visitors below: ・ JICA: OJT trainee, JOCV of Yokohama City and Internship (JICA staff and university student) ・ Local government: teachers of Kanagawa Prefecture
ABE Initiative	・ Commercial Director of ZAWA	Sent a recommendation letter to JICA when applying, expecting to strengthen the cooperation of ZAWA with Japanese ODA.

2.3 Activities Conducted

The conducted activities and the achievements are summarized below. The numerical order of the activities corresponds to that of PDM_{3-5}.

(1) Output-1: Information Management

(1)-1 Define KPIs of WUM and monitoring indicators of activity in PDM, and collect and analyze them monthly.

- Initial selection and extension of KPIs for the MIS

The Experts initiated the MIS in the 1st contract year comprised of 10 KPIs, which was extended stepwise as shown in Table 2-03 with the 16 KPIs from the 3rd contract year. By the initiative of C/Ps, a steering committee was organized within ZAWA in June 2015 for the extension of the MIS, with the result of the extended MIS for ZFY-2015 before getting the approval of the Management Team.

- Establishment of MIS Platform and MIS Steering Committee

In the 2nd contract year, the Experts developed an MIS platform using Excel to facilitate the compilation and analysis of collected data and the preparation of MIS report. It was taken over to the C/Ps after several hands-on sessions. The C/Ps have been preparing and submitting the concise monthly report using this platform, as well as the more comprehensive and detailed report quarterly to the Management Team. In line with this, the Experts gave an OJT to the C/Ps to modify the Excel platform, reflecting the extension of KPIs as well as adding the function of referring to and comparing with the data of previous month and of the same month of the previous year.

Table 2-03 Extension Status of MIS

S/N	KPIs in FY 2012/2013	KPIs in FY 2013/2014	KPIs in FY 2014/2015	KPIs in FY 2015/2016
1	Production Volume (m^3/month)	Production Volume (m^3/month)	Production Volume (m^3/month)	Demand Ratio
2	Samples	Water Quality Test	Water Quality Test	Water Quality
3	Leakage Repair	Leakage Repair	Leakage Repair	Leakage Repair
4	Service Connections	New Connections	New Connections	Connection Increase Rate
5	Disconnections	Disconnections	Disconnections	Disconnections
6	Sales of Water	Sales of Water	Sales of Water according to District Offices i.e. North A, North B, Central, Urban, West and South	Water Sales
7	Financial Balance	Revenue	Revenue	Operating Ratio
8	Unit Cost of Production	Expenditure	Expenditure	Collection Efficiency
9	Customer Complaints	Unit Cost (Tsh/m^3)	Unit Cost (Tsh/m^3)	Unit Cost (Tsh/m^3)
10	Number of Staff	Number of Staff	Number of Staff	Number of Staff per 1000 Connections
11		Number of Connections (Metered/Unmetered; Breakdown into Usage Categories)	Number of Connections according to District Offices i.e. North A, North B, Central, Urban, West and South	No. of Registered Customer
12		Bills (Number of Bills Delivered; Billed Amount according to Usage Categories)	Number of Bills Delivered according to Usage Categories i.e. Domestic, Commercial/Industrial, Institutional and Kiosk/Water Point	Billing Efficiency
13		Customer Complaints	Customer Complaints	Customer Complaints
14				Metering Ratio
15				Water Connection Rehabilitation
16				No. of Operational Water Sources

(1)-2 Establish MIS for comparison of KPIs in ZAWA and other utilities.

- Comparison with the KPIs of other Water Utilities

  The above-mentioned steering committee also collected for reference the preceding practices of the water utilities in Tanzania Mainland, Kenya, Japan, etc. The data is referred to in the monthly and quarterly MIS reports for the comparison and evaluation of the performance of ZAWA, in addition to the data of previous month and of the corresponding month of the previous year of ZAWA.

- Utilization of MIS by ZAWA Management Team

  The Management Team sometimes directs the C/Ps to collect and compile the more detailed data in addition to the monthly MIS. This can be included in the MIS as the additional KPIs in the future extension.

(1)-3 Strengthen the budgetary control through planning of "NRW reduction activities in UWS" which will be incorporated into the ABP.

- Preparation of ABP

  The Annual Business Plan (hereinafter "ABP") is a tool to link the preparation and implementation of the budget to the financial settlement. It shows an expected overview of the annual budget of the next financial year prior to its preparation during the 2nd quarter of every year. The overview is based on the annual report of the previous financial year, the monthly MIS and the quarterly report on the implementation of budget (refer to the Figure 2-01).

  The C/Ps organize a series of interview with the concerned sections regarding their requests for the next financial year, and arrange the requests in accordance with the strategic objectives listed in the current Strategic Business Plan 2013-2018. Through this, the overall structure of budget request can be made clear and the process of budget compilation and appraisal can be made short and transparent.

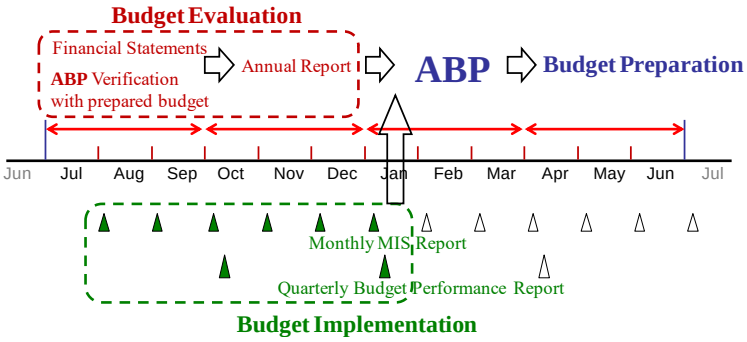


Figure 2-01 Linkage among Budget, Financial Settlement, Annual Report and ABP

Prior to the compilation of the budget for ZFY-2015, the Experts prepared the template of ABP in January 2015, followed by the workshop interviewing with every section regarding the request for the next financial year. The prepared ABP was approved by the Management Team in July 2015, which was slightly too late to be utilized fully for the compilation of the budget.

Reflecting this, the preparation of the ABP for the ZFY-2016 was launched 2 months earlier than the previous year. The interview session was started by the initiative of C/Ps in December 2015 and the draft of ABP was approved by the Management Team on February 2016 before being utilized in the budget preparation process for ZFY-2016.

- Budgeting for Pilot Project

  The Expert and C/Ps started the calculation of necessary cost for the Pilot Project in the 2nd

contract year. Depending on the subsidy from the RGoZ to cover the cost, ZAWA should negotiate with RGoZ for every disbursement of subsidy. The revision process of SBP was on-going in the 1st contract year and it was approved by the RGoZ as the condition of disbursing AfDB loan.

ZAWA negotiated with RGoZ to cover the necessary cost for the Pilot Project from the Infrastructure Fund of RGoZ, with the result of the disbursement divided into 2 fiscal years of ZFY-2013 and ZFY-2014. The division of the disbursement is due to the lack of the fund.

(1)-4 Other Related Activities

- Preparation of AR

The Annual Report (hereinafter "AR") is utilized in the preparation process of the ABP and the subsequent annual budget as the feedback from the fiscal year of 2 years back. It should be prepared and approved by the Board and be submitted to the MLWEE within 6 months after the end of each fiscal year, that is by the end of December, based on the article 34 of the Water Act, 2006. Previously ZAWA submitted the audited financial statement in place of the annual report, which should be one of the attached documents to the annual report.

Putting the ZFY-2013 as the trial period, the Experts prepared the table of contents of the AR in September 2014, and completed the draft report 2013/2014 in February 2015 with the cooperation of C/Ps. The C/Ps took the initiative to prepare the AR 2014/2015 and completed the draft in October 2015 before submitting it to the Management Team.

- Development of ICT Improvement Plan

The improvement of ICT system is one of the important means for the efficient and proper information management. The Team organized a special committee within ZAWA in August 2016 and have been participating in it for the ICT improvement, after the detailed survey on the status of ICT hardware and software, the maintenance contracts of software applications, the skilled level of operation by the staff and the challenges.

The existing application software comprises the SBM2 for customer management, the PASTEL for financial accounting, the ARUTI for payroll calculation, the GeODIN for water resources management and the ArcGIS. Table 2-04 shows the evaluation result of software in terms of usability and maintainability.

Since the usability of the SBM2 is considerably lower than other applications, the special committee held an interview session with the staff users on the specific problems of SBM2 to be improved. It was proved that there are basic bugs in SBM2 such as "more than one account number is created for a single reference number to a new customer" and "another whole new account number is created when any attributes of single registered customer is modified". Moreover the function of creating the list of main data should be activated. These not only hamper the efficient information management related to customers including the MIS, but also shall hamper the efficient handling of increasing customers and bills when the Yen loan project shall be launched for which the preparatory survey by JICA has been started.

The outline of the maintenance contract between ZAWA and OIKOS, the manufacturer of SBM2, is as below. It needs to be renewed as it has already been expired in June 2016. The contract price is higher than the other software that ZAWA currently uses whereas the performance of the maintenance and improvement work has not been good. ZAWA has requested many improvements from time to time but because the contract is on daily basis and not on performance basis, OIKOS can impose additional charge whenever ZAWA requests beyond the contract days.

Table 2-04 Evaluation of Existing Software Applications in ZAWA

Criteria	Items		Yes (1) / No(0)				
			SBM2	Pastel	Payroll	GeODin	ArcGIS
Useability	Understandability	1. It is straightforward to understand what the software does and its purpose.	1	1	1	1	1
		2. It is straightforward to understand the use of the software.	1	1	1	1	1
		3. It is straightforward to understand the software's basic functions.	1	1	1	1	1
		4. It is straightforward to understand the software's advanced functions.	1	0	0	1	0
		5. Software help is available.	0	1	1	1	1
	User Documentation	6. Consists of clear, step-by-step instructions.	0	1	1	1	1
		7. Provides a high-level overview of the software.	0	1	1	1	1
		8. Gives examples of what the user can see at each step e.g. screen shots or command-line excerpts.	0	1	1	1	1
		9. For problems and error messages, the symptoms and step-by-step solutions are provided	0	1	1	1	1
		10. States command names, says what menus to use, lists error messages exactly as they appear.	0	1	1	1	1
		11. What version of the software the documentation applies to.	0	1	1	1	1
		12. It is available to the users.	0	1	1	1	1
	Installability	13. It is straightforward to meet the pre-requisites for the software on a target platform.	1	1	1	1	1
		14. It is straightforward to install the software onto a target platform.	1	1	1	1	1
		15. It is straightforward to configure the software following installation for use.	1	1	1	1	1
		16. It is straightforward to verify the installation for use.	1	1	1	1	1
		17. All mandatory third-party dependencies are currently available.	1	1	1	1	1
		18. Tests are provided to verify the install has succeeded.	1	1	1	1	1
		19. When software is installed, its contents are organized into sub-directories.	1	1	1	1	1
		20. Uninstallers uninstall every file or warns user of any files that were not removed and where these are.	1	1	1	1	1
	Learnability	21. A getting started printed guide is provided by ZAWA outlining a basic example of using the software.	0	0	0	0	0
		22. Verbal instructions are provided by ZAWA for many basic use cases.	1	1	1	1	1
		23. Printed instructions are provided by ZAWA for many basic use cases.	0	0	0	0	0
	Sum		**13**	**20**	**20**	**21**	**20**
Maintainability	Licensing	25. Has an appropriate license	1	1	1	1	1
	Portability	26. Application can be built on and run under earlier Windows.	1	1	1	1	0
		27. Application can be built on and run under Windows 7.	1	1	1	1	1
		28. Application can be built on and run under Windows XP.	1	1	1	1	1
		29. Application can be built on and run under Windows Vista.	1	1	1	1	1
	Supportability	30. Software website has page describing how to get support.	0	1	1	1	1
		31. Software web site has search facility.	0	0	0	0	1
		32. Customer service is available locally.	1	1	1	0	1
		33. Customer service responds properly.	1	1	1	1	1
	Changeability	34. It is straightforward to modify the software to address issues, modify functionality, or add new functionality.	1	0	0	0	1
	Sum		**8**	**8**	**8**	**7**	**9**
Total Score			**21**	**28**	**28**	**28**	**29**

- Dispatch of maintenance personnel for 2 times per year, each 10 days of which 5 days in Unguja and 5 days in Pemba;
- Annual contract price: 9.4 million TZS;
- Extra charge of daily 400 thousand TZS should be paid for the maintenance work not finished during the dispatch period.

Based on this, an official request of ZAWA for the cost estimate was sent to OIKOS on 14 September 2016 for a list of improvement for SBM2. The Management Team shall decide whether ZAWA shall continue using SBM2 or to replace it by another software application based on the cost estimate to be submitted by OIKOS.

(2) Output-2: Human Resources Management

(2)-1 Develop a revised organization structure with transitional plan.

- Proposal on Organization Reform

  In the 1st contract year, the revision of the Strategic Business Plan was on-going by the assistance of AfDB, and in line with this a draft organization reform plan was proposed to ZAWA by the AfDB team. The Experts submitted to ZAWA the recommendations for this proposal.

  In the 3rd contract year, a conceptual proposal was submitted to DG in June 2014 as the primary proposal for the organization reform, comprising (a) extension of the function of District Offices by adding the functions of customer management and accounting to the existing O&M; (b) assignment of a Director for the District Offices; (c) to merge the Mapping Section of Water Development Department and the ICT Unit; (d) to merge the Monitoring and Evaluation Section of Water Development Department and the Planning and Policy Unit; (e) assignment of a Secretary General to manage all the units which are currently under the direct control of DG (refer to 4.4).

  As the background of this proposal, the decentralization policy for governmental organizations and their agencies were enacted in ZFY-2013, and in line with ZAWA `s establishment of Central District Office in September 2013 followed by the District Offices of North A and North B. This proposal aimed to establish a matrix-type of organization to implement an effective and efficient decentralization.

- Needs Assessment of ZAWA for Organization Reform

  Since the above-mentioned proposal on the organization reform was kept pending by the Management Team, the Experts together with the C/Ps conducted a questionnaire survey from September to October 2014 to the staff in order to identify the challenges that ZAWA currently faces. This survey targeted all the staff above assistant officer level and a part of other staff below that which were selected randomly. The purpose was to evaluate and to identify challenges of the management of ZAWA, and to identify possible solutions for a better organization structure.

  Based on the histogram of the result, a larger portion of respondents proved to give negative response to the items such as identified customers, sufficient staffing, rewarded staff, training opportunities, front line information, IT system, corrective action and meeting, and paper work minimized.

  In addition to the insufficient number of staff as stated above, it was often pointed out that the sections where the employee belongs to are not clear and the management of employee is not good in terms of daily work record. To improve this, the Experts together with C/Ps submitted the second proposal for organization reform to DG in February 2015, comprising of the creation of sub-divisions and the corresponding staff reallocation.

- Response on the Organization Reform Proposal from the Management Team

  The Experts provided a presentation of these two proposals to the Management Team in August 2015, with the conclusion that the primary proposal for which the approval by the ZAWA Board is required is to be investigated further. The secondary proposal for which the approval by the Board is not required was approved for the immediate implementation; the organization reform below section level can be implemented by the approval of the Management Team.

  The Management Team requested the Experts regarding the primary proposal that (a) the organization reform shall be implemented after finishing the period of SBP 2013-2018; and (b) the organization reform of Pemba Branch shall be investigated together with Unguja.

- Clarification of Workflow

  In line with the further investigation of the primary organization reform proposal, the current workflow of every department/ division was made clear in March 2016 as shown in the "Maps and Graphs" at the beginning of this report. This can be the basis for defining the job descriptions and for investigating the organization reform.

(2)-2 Propose plan for improving recruitment, allocation and management of staffs in ZAWA HQs and District Offices.

- Work Record System

  In the 1st contract year, the Experts prepared the draft guidelines for the work record and performance appraisal of the staff in December 2011, but it was neglected without being put into practice.

  The complicated procedure of preparing, reviewing, approving and keeping record of the various forms that the required guidelines was not suited to the culture of ZAWA and was considered the main cause of the neglect.

  Reflecting this, a simple schedule recording and sharing system using white board was proposed and introduced in December 2013 in the Head Office and June 2014 in the District Offices respectively.

  Aiming at facilitating the coordination of internal meetings, the check and recording by the HR personnel, as well as raising the awareness of the staff towards the self management in terms of PDCA cycle, this system has been utilized to date, though there is slight difference among the sections (refer to Picture 2-01).

Picture 2-01 Schedule Management Using White Board (Credit Control Section)

- Plan of Establishing District Offices in Urban West Region

  The District Office of Urban District has not been established, while the District Office of West District has been established but not been activated in order to avoid the duplication of the activities of the Head Office.

  Because of the dense population in the Urban-West Region, a drastic increase of water tariff revenue can be expected by enhancing the customer management. In line with the further investigation of the primary proposal of organization reform as stated in 2:2-1, the plan of establishing/strengthening the function of district offices focusing on Urban District and West District has been under development from July 2016, comprising of the boundary of the control area, the proposed location of the district offices, the O&M plan for borehole pumping stations and the staff reallocation plan. The development shall be continued by the C/Ps after the completion of the project.

(2)-3 Review of the training policy, prepare and implement yearly program for staff training.

- Training at Mtoni Training Center (Water Development Center)

  The questionnaire survey as stated in (2)-1 showed the negative opinion against training opportunities. In addition to this, another questionnaire survey was conducted in September -October 2014 on the requested topic and method of the training, and the topics most frequently requested were as below:

  - plumbing and laying/ repair of pipes;

- meter installation and testing;
- laws, rules and regulation related to technical issues.

ZAWA established its own training center called "Water Development Center" in Mtoni and started its operation in January 2014. This center is aimed at the bottom-up of the capacity of ZAWA staff, and in the future is intended to be an authentic public educational institute after receiving the official certificate of National Council for Technical Education (NACTE) in order to support the career development of ZAWA staff.

The first batch of the training program was from January 2014 to November 2015, with 2 days lecturing per week by the ZAWA trainers, covering the basics of plumbing, meter installation and the O&M of pumps, while the second batch is now on-going and focuses on the advanced management of meter and pump.

In addition to this, the Experts agreed with ZAWA to start the GIS training program for the 18 trainees from September 2016 up to December 2016, in order to give training for the practical operation of GIS which is directly linked to the improvement of customer management. The program has started on the 21st day of September 2016 as scheduled.

(2)-4 Review and propose amendment of staff rules and regulations.

- Development of ZAWA Scheme of Service

The salary of the ZAWA staff was once decided by the educational qualification only, which allowed no increment unless the staff got any higher educational qualification and thus hampered the incentive of the staff for the better performance. Since this kind of salary system was prevalent in other governmental organizations and public institutions as well, the GoZ enacted the Public Service Act, 2011 with the intention to change this system. In the article 62 of this act, the public service organization shall develop its Scheme of Service and the Public Service Committee approves this.

By the initiative of the C/Ps, the ZAWA Scheme of Service was drafted, in which several ranks of a single job cadre are created such as "assistant" and "subsidiary" with the clear job duties and the recruitment and promotion conditions and the newly created salary scale is applied to each designation (refer to Table 2-05). Every salary scale allows a given annual salary increment, and clarifying the promotion chain, condition and salary are expected to raise the motivation of the staffs. This draft was approved by the ZAWA Board in May 2015, followed by the third party review by the Labor and Public Service of the Presidential Office and the subsequent final review by the Public Service Committee as of September 2016.

Table 2-05 Cadres and Salary Scales in ZAWA Scheme of Service

Cadre		Grade3	Grade2	Grade1	Senior Grade 2	Senior Grade 1	Principal Grade 2	Principal Grade 1
Engineer			I-4	J-1	K-1		L-1	M-1
Technician		G-3	H-1	I-1	J-1	K-1		
Artisan		D-2	E-1	F-1	G-1	H-1		
Cashier/Bill Attendant/Credit Control Officer			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Customer Service/ Data Entry Officer			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Meter Analyst		G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Monitoring and Evaluation			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Accountant/ Internal Auditor			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Planning and Policy Officer			I-4	J-1	K-1		L-1	M-1
	Assistant	D-2	E-1	F-1	G-1	H-1		
	Subsidiary		I-4	J-1	K-1	L-1	M-1	

Cadre		Grade3	Grade2	Grade1	Senior Grade 2	Senior Grade 1	Principal Grade 2	Principal Grade 1
Procurement Officer			I-4	J-1	K-1	L-1	M-1	
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Human Resources Officer			I-4	J-1	K-1	L-1	M-1	
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Legal Officer			I-4	J-1	K-1	L-1	M-1	
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Research, Innovation and Development Officer			I-4	J-1	K-1		L-1	M-1
Public Relations Officer			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Computer Programmer			I-4	J-1	K-1		L-1	M-1
Computer Operator			I-4	J-1	K-1		L-1	M-1
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Data Management Officer			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Personal Secretary		D-2	E-1	F-1	G-1	H-1		
Office Attendant/ Messenger		A-3	B-1	C-1	D-1	E-1		
Driver		A-3	B-1	C-1	D-1	E-1		
Security Guard		A-3	B-1	C-1	D-1	E-1		
Gardener		A-3	B-1	C-1	D-1	E-1		
Administrative Officer			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Policy Analyst			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Statistician Officer			I-4	J-1	K-1		L-1	M-1
	Assistant	G-3	H-1	I-1	J-1	K-1		
	Subsidiary	D-2	E-1	F-1	G-1	H-1		
Transport Officer			I-4	J-1	K-1		L-1	M-1
Heavy Truck Driver		A-5	B-1	C-1	D-1	E-1		
Officer Superintendent		G-3	H-1	I-1	J-1	K-1		

Note: The corresponding monthly salary of each salary scale is as below: **A-3**: 232,308 TZS, **A-5**: 235,308 TZS, **B-1**: 244,308 TZS, **C-1**: 264,308 TZS, **D-1**: 289,308 TZS, **D-2**: 292,308 TZS, **E-1**: 319,308 TZS, **F-1**: 354,308 TZS, **G-1**: 394,308TZS, **G-3**: 403,308 TZS, **H-1**: 439,308TZS, **J-1**: 544,308 TZS, **K-1**: 604,308 TZS, **L-1**: 669,308 TZS, **M-1**: 739,308 TZS.

- Defining Job Descriptions

  Based on the current workflow as stated in 2:2-1, the job description of each current designation was defined after detailed interviews with the concerned employee. Job descriptions were developed both in the phase 1 of the JICA technical cooperation and in the AfDB project, but it was proved that they had not been utilized. Thus the Experts tried to evaluate the jobs from all the aspects, not only the job duties but also the necessary qualifications, knowledge and skills, job features such as the number and level of immediate subordinates, safety, budget and quantifiable assets, freedom to act, job environment such as office/site job, physical load and hazards (refer to Table 2-06).

Table 2-06 Proposed Articles of Job Descriptions

Non-Management	Management
Fiscal Year; Job Title; Department /Unit /Section /Sub-Section; Job Holder	Fiscal Year; Job Title; Department /Unit /Section /Sub-Section; Job Holder
Agreement Status: (1) Agreed date by job holder (with date and signature) (2) Agreed date by supervisor (with date and signature) (3) Agreed date by controlling officer (HOD) (with date and signature) (4) Date Lastly Updated	Agreement Status: (1) Agreed date by job holder (with date and signature) (2) Agreed date by supervisor (with date and signature) (3) Agreed date by controlling officer (HOD) (with date and signature) (4) Date Lastly Updated
Agreed measurable standards and targets (done for every year): (1) This year's standards (2) Targets agreed with supervisor for the year	Agreed measurable standards and targets (done for every year): (1) This year's standards (2) Targets agreed with supervisor for the year

Non-Management	Management
Organization chart (how the job is positioned)	Organization chart (how the job is positioned)
Job Purpose (The reason why the job was established)	Job Purpose (The reason why the job was established)
Statement of Main Duties (Principles of accountability)	Statement of Main Duties (Principles of accountability): (1) Principle accountabilities (2) Corresponding end results
-	Critical result area
-	Job context (sphere of action and influence-relations)
-	Supervisory/managerial breadth/authority to exercise
-	Number and level of immediate subordinates
Knowledge and skills requirement: (1) General education (2) Professional/vocational qualification (3) Relevant pre-job experience (4) Physical skills (5) Written skills (6) Oral skills (7) Numeric/computing skills	Knowledge and skills requirement: (1) General education (2) Professional/vocational qualification (3) Relevant pre-job experience (4) Managerial skills (5) Entrepreneurial skills (6) Physical skills (7) Communication skills (8) Numeric/computing skills (9) Responsibility for resources (10) Human relations
Job features: (1) Number and level of subordinates (2) Quality of subordinates (3) Budget and Quantifiable assets (4) Safety and health of others (5) Freedom to act (decision-making) (6) Analytical requirements/problem solving (7) Numerical requirements (8) Vigilance (9) Human relations (10) Consequence of error	
Environmental and other features: (1) Working conditions (2) Physical effort (3) Hazards	Environmental and other features: (1) Working conditions (2) Physical effort (3) Hazards

(3) Output-3: Customer Management

(3)-1 Register all households in UWS and customers in the Model System into SBM-GIS and update them.

- Household Survey for the Residents in Urban Water System (UWS)

The household survey was conducted for the whole Shehias of Urban District in the 1st contract year and for the urbanized area of West District in the 2nd contract year i.e. 23 Shehias among 39 Shehias. This survey was to identify the location of the households on the map and to update the existing SBM data. The registration of all HHs on SBM-GIS was completed in November 2014 (refer to Table 2-07). The information obtained by this survey had been utilized as the basic data for the water demand forecasting necessary to develop the infrastructure rehabilitation plan up until the completion of the Service Connection (hereinafter "SC") survey which was launched in the 2nd contract year.

Table 2-07 Result of Household Survey

District	Shehias surveyed	Inhabited	Connected	Registered	Ratio of Connected	Ratio of Registered
		A: HHs	B: HHs	C: HHs	B/A: %	C/A: %
Urban	45/45	27,761	17,056	7,041	61.4%	25.4%
West	23/39	75,345	21,939	6,541	29.1%	8.7%
Sum	68/84	104,106	38,995	13,582	37.5%	13.0%

- Service Connection Survey for Model System and Neighboring Area

The SC survey was aimed at collecting more detailed information on service connections in addition to the result of the household survey such as the location of service laterals and the length and diameter of service pipe also recording the collected information in GIS as

well as validating and updating the current SBM-2 data.

The SC survey in the Model System i.e. Sateeni, which is subject to the expected AfDB loan project, started in January 2014 and site survey was completed in June 2015. From the latter half of July 2015 after the end of Ramadan, the SC survey was resumed in the Mpendae System which is next to the Model System and is subject to the draft design by the Team. The result of the site survey is shown in Table 2-08.

Table 2-08 Result of SC Survey

Shehia	Distribution System	District	SC Survey (HHs)												
			Finished date	Supplied by ZAWA						Not Supplied by ZAWA				Absent when Surveyed	Total HHs
				Registered			Unregistered			Private Water Source	Connected to Illegal Provider	Water Source unindentified	Sum		
				Metered	Non-Metered	Sum	Public Institutions	Illegal	Sum						
Gulioni	Model	Urban	Jun 2014	2	237	**239**	0	181	**181**	0	0	0	0	0	420
Jang'ombe		Urban	Apr 2016	0	2	**2**	524	48	**572**	18	274	0	292	142	1,008
Kikuwajuni Bondeni	Model	Urban	May 2015	0	33	**33**	0	378	**378**	0	0	0	0	23	434
Kikuwajuni Juu	Model	Urban	May 2015	0	13	**13**	5	383	**388**	3	0	0	3	36	440
Kilimani		Urban	Feb 2016	2	78	**80**	66	98	**164**	20	143	0	163	232	639
Kiponda	Model	Urban	Nov 2014	0	4	**4**	0	131	**131**	10	103	0	113	6	254
Kisima Majongoo	Model	Urban	Apr 2015	0	75	**75**	3	432	**435**	2	14	0	16	0	526
Kisiwandui	Model	Urban	Mar 2015	0	65	**65**	1	243	**244**	0	2	0	2	20	331
Kwaalinatu		Urban	Mar 2016	0	5	**5**	244	103	**347**	31	173	0	204	58	614
Kwaalimsha		Urban	Jun 2016	0	28	**28**	5	148	**153**	5	126	139	270	45	496
Kwahani		Urban	Jun 2016	0	7	**7**	14	214	**228**	6	228	99	333	110	678
Makadara	Model	Urban	Aug 2014	756	56	**812**	1	44	**45**	1	0	0	1	0	858
Malindi	Model	Urban	Dec 2014	0	101	**101**	0	301	**301**	1	50	0	51	54	507
Matarumbeta		Urban	May 2015	0	0	**0**	49	198	**247**	9	115	0	124	61	432
Mchangani	Model	Urban	Mar 2014	0	169	**169**	3	27	**30**	126	45	0	171	0	370
Meya		Urban	May 2016	0	51	**51**	237	139	**376**	12	288	0	300	135	862
Miembeni	Model	Urban	Jun 2015	0	45	**45**	1	793	**794**	16	8	0	24	23	886
Migombani		Urban	Jan 2015	0	238	**238**	93	207	**300**	7	316	0	323	105	966
Mikunguni	Model	Urban	Sep 2014	0	24	**24**	0	278	**278**	0	1	0	1	18	321
Mkele	Model	Urban	Jul 2016	0	28	**28**	11	230	**241**	10	333	350	693	82	1,044
Mkunazini	Model	Urban	Nov 2014	0	26	**26**	0	324	**324**	3	280	0	283	55	688
Mlandage	Model	Urban	Jan 2015	0	124	**124**	2	236	**238**	12	17	0	29	48	439
Mpendae		Urban	Nov 2015	0	165	**165**	992	488	**1,480**	78	66	0	144	26	1,815
Mwembeladu	Model	Urban	Jan 2015	0	85	**85**	1	313	**314**	17	24	0	41	73	513
Mwembeshauri	Model	Urban	Mar 2015	0	3	**3**	4	320	**324**	0	8	0	8	17	352
Mwembetanga	Model	Urban	Mar 2015	0	132	**132**	1	366	**367**	0	8	0	8	11	518
Rahaleo	Model	Urban	Feb 2015	0	46	**46**	0	312	**312**	4	7	0	11	26	395
Shangani	Model	Urban	Nov 2014	0	21	**21**	0	204	**204**	27	260	0	287	44	556
Shaurimoyo	Model	Urban	Sep 2014	0	288	**288**	26	667	**693**	3	90	0	93	310	1,384
Urusi		Urban	Dec 2015	0	88	**88**	615	216	**831**	9	108	0	117	16	1,052
Vikokotoni	Model	Urban	Feb 2015	0	63	**63**	0	240	**240**	9	13	0	22	60	385
Sum	21	31	-	760	2,300	**3,060**	2,898	8,262	**11,160**	439	3,100	588	4,127	1,836	20,183

The validation and updating of current SBM-2 data with the collected data by the SC survey is one of the most important steps to link the result of SC survey to the increase of tariff income, but only three Shehias were completed: Makadara, Mchangani, and Gulioni as of September 2016. The other Shehias remain to be finished with considerable delay. It was proved that one of the reasons of this delay is the lack of necessary staff, and hence subsequently two persons of Data Management Section were newly added in August 2016 to the existing four persons.

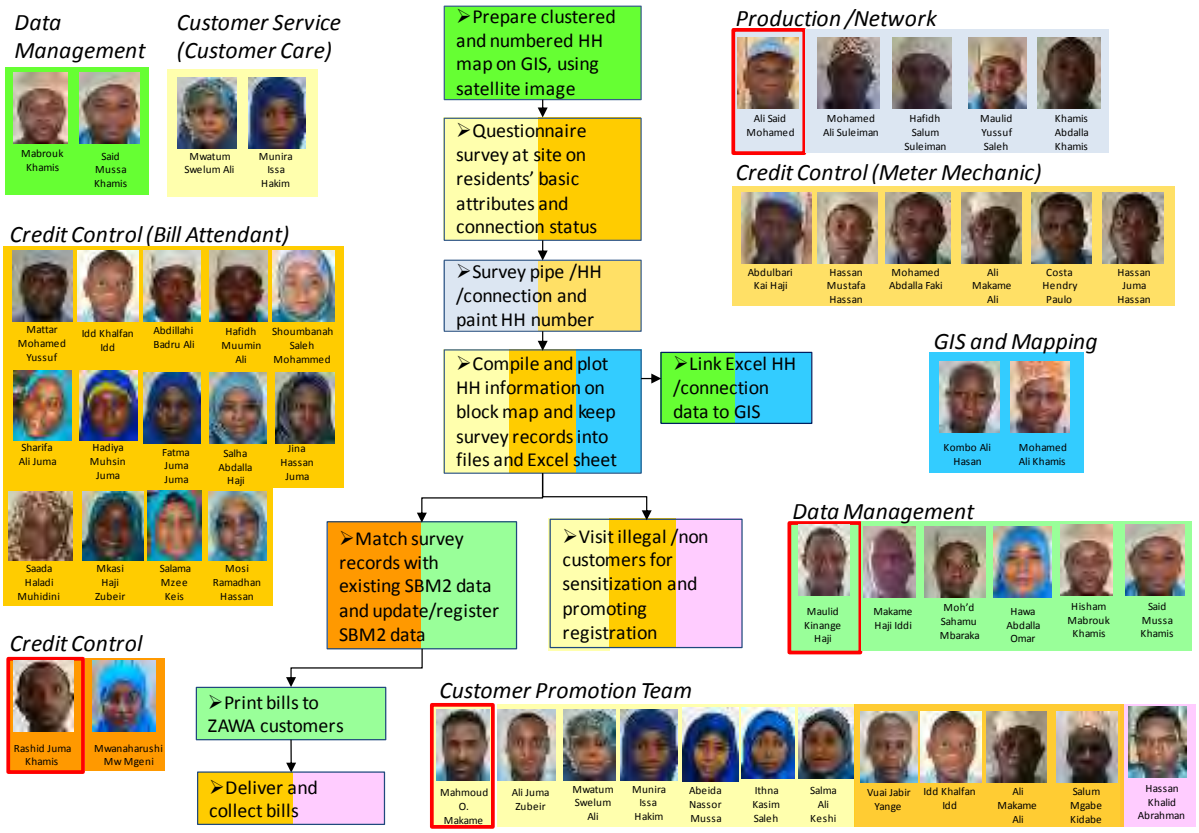
(3)-2 Improve the existing bill collection guideline

The Customer Management Guideline is to define the basic principles, the workflow and staff in charge and the notes for the processing of (a) identification and registration of customers; (b) meter installation and reading; (c) determination of water tariff; (d) printing, delivery and collection of bills; (e) credit control; and (f) settling customer complaints. The taskforce team with the assistance of the Experts started the preparation of the draft guideline in September 2014, followed by the completion of the first draft in December 2014 covering the bill collection and credit control.

Since preparation of the remaining part of the guideline was delayed, it was agreed that the preparation shall be done in parallel to the OJT activity for meter reading as shown in 2:3-3. The final draft of the guideline was completed in May 2016 as attached in 4.4 (4), followed by a series of OJT on the utilization of this guideline, focusing on the topics of

(a) the validation and updating of current SBM2 data with SC survey results; (b) customer promotion; and (c) meter installation.

The workflow of SC survey followed by the validation of SBM-2 data and the customer promotion needs collaboration of several sections as shown in Figure 2-02. The validation process of SBM-2 with the SC survey result is complicated as shown in Figure 2-03, includes several branches and requires the site visit for reconfirmation. Since every component of customer management is likewise complicated and needs the close collaboration of concerned departments and sections, the workflow was ensured to be followed and the leaders were nominated to enhance collaboration among the clustered activities in the OJT on utilization of the guideline.



Note: The employee with red border is the leader of each clustered activity.

Figure 2-02 Flowchart of SC Survey, Billing, Collection and Customer Promotion

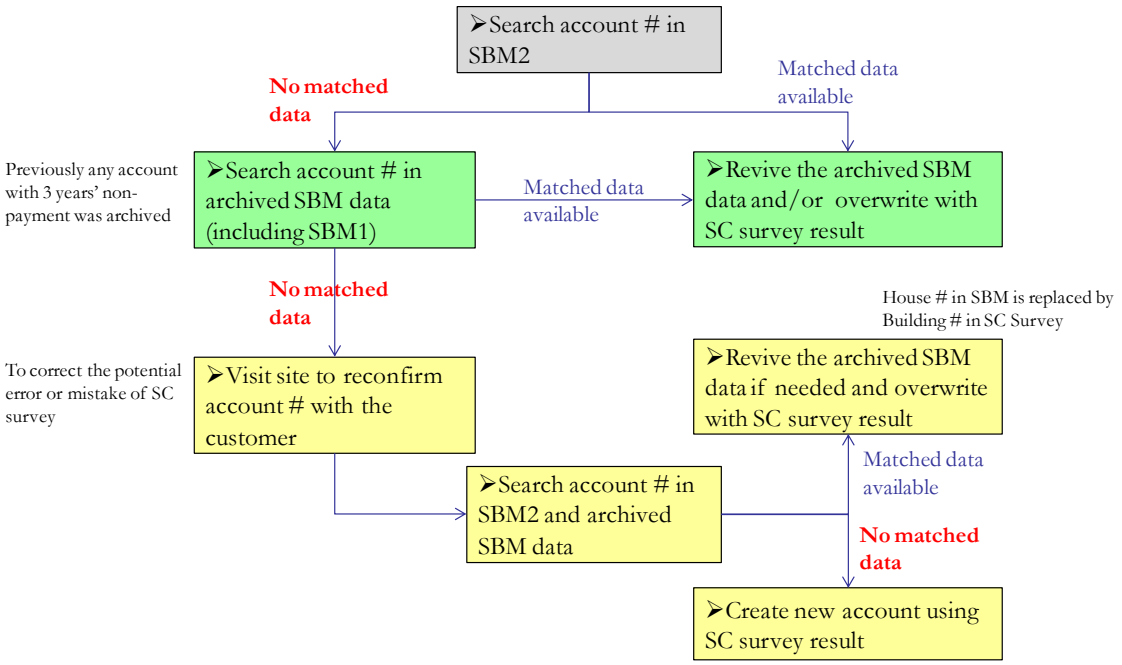


Figure 2-03 Validation and Updating Procedure of SBM-2 Data Using SC Survey Result

(3)-3 Improve billing activities (from meter-reading to invoicing) within the Model System.

- Area, Scope and Target of OJT

  The Shehia of Makadara was selected as the initial area of OJT for meter reading since it is the only Shehia among the Shehias of the Model System where the meter installation has been almost finished. The OJT started in May 2015 and the area was expanded in the Bububu Shehia from June 2016 which is just next to the northern periphery of the Model System. This was after finishing the training of four persons as trainers which enables the extension of OJT by ZAWA itself. The scope of the OJT is comprised of the following two topics:

  - Meter reading trip using route map and the operation of handy terminal;
  - Thorough preparation before meter reading trip i.e. map reading and confirmation of customer data.

  The verification indicator was selected as the number of HHs subject to meter reading per month and party (two persons), of which the baseline is 200 HHs/month/party obtained from the actual information in ZFY-2013 while the target is set as 400 HHs/month/party. Moreover the number of metered customers shall be increased from the current 2,000 HHs to the tens of thousands HHs after completing the rehabilitation and systemization of distribution network and the installation of water meters through AfDB and the expected JICA loan project. In this regard, the following value was set as the target of the OJT, by assuming the engaged hours and days for meter reading as 4 hours/day and 10 days/month respectively:

  - Current Value: 2.5 HHs/hrs, 10 HHs/day, 100 HHs/month
  - Target Value: 25.0 HHs/hrs, 100 HHs/day, 1,000 HHs/month

- Procured Equipment for OJT and Progress of Meter Reading OJT

  The OJT started using the handy terminals which were procured during the phase-I of the technical cooperation, but it was proved that the usability of the terminal is not good, particularly in taking long time to confirm the customer information before starting meter reading. Considering the future extension of meter reading activity in the Sateeni Model System of which potential customers are around 8,000 HHs, the following equipment was procured in January 2016:

- Handy Terminal: 10 sets, smartphone type, subject to various application software
- Bill Printer: 2 sets

- Progress of Meter Reading OJT

The monitoring of meter reading OJT was started on May 2015 as shown in Figure 2-04. The portable handset that was used for OJT meter reading was the handy terminal from May 2015 to February 2016, followed by smartphone from May 2016 onwards.

The on-site activity was banned in March 2016 due to the re-execution of the general election. Also there was no OJT in the succeeding April 2016, because the water tariff hike which was enacted in the 2013 revision of the regulation, was suddenly put into operation, and the ZAWA staff of the Commercial Department were so busy with the change of initial setting of SMB-2 e.g. changing the unit price of volumetric tariff, and with the handling of customer complaints.

The achievement of the target value through the OJT is shown in Figure 2-04, which shows that the number of HHs that a bill attendant can read is around 800 HHs/month by using handy terminals, and above 1,400 HHs/month by using smart phones.

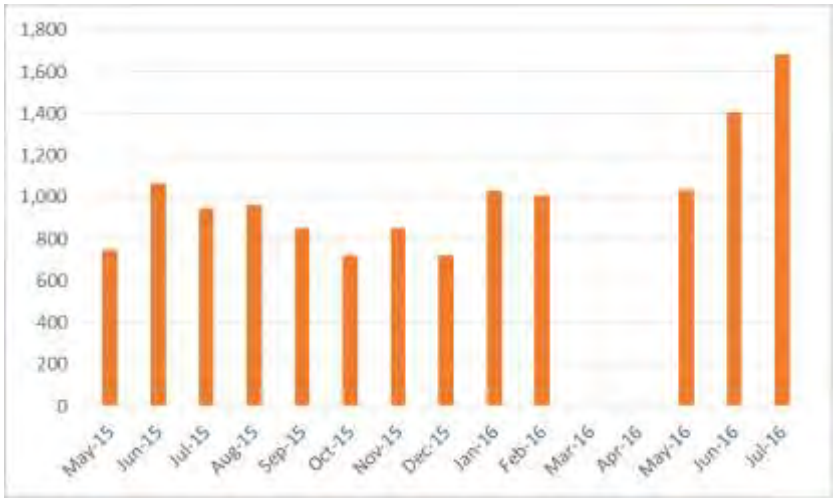


Figure 2-04 Progress of OJT on Meter Reading (HH/month/reader)

The bill delivery status in Makadara is as below, which is defined as one of the verifiable indicators in the PDM. It has achieved the target values.

	Target	Achievement
- Number of Delivered Bills	95%	Above 96 % after March 2016
- Amount of Delivered Bills	98%	Above 98 % after May 2016

Figure 2-05 Progress of OJT on Bill Delivery

(3)-4 Enhance Public Relations to Increase the Sales of Water

- Installing Signboard for Advertisement

  Based on the result of the customer satisfaction survey conducted in January 2015 at Makadara, the Experts proposed to put up a signboard at Makadara and in front of ZAWA HQs for advertising the effort of ZAWA to improve the water supply service and for requesting the customers to pay water tariff (refer to Picture 2-02). The signboard at Makadara was reportedly stolen in October 2015 during the campaigning period of Tanzania general election, according to the local residents.

Photo 2-02 Signboard in Makadara (Left as of August 2015; Right as of December 2015)

- Customer Promotion

  Customer promotion, sensitization of customers for tariff payment, and supplementary SC survey for the non-responsive HHs were launched in May 2016, by organizing a team comprising of 12 C/Ps. The target Shehias were selected among the Shehias where (a) the SC site survey was completed; and (b) the water supply service was fairly good which suggests a considerable increase in new connections and tariff payment shall be expected. The response of the residents proved to be not favorable as shown in Table 2-09, and an average of 3.1 persons/day is required to get a single new connection.

  After finishing the first 2 Shehias i.e. Gulioni and Mchangani, the target HHs were shifted to (a) owners of large building identified by GIS maps; and (b) customers with large amount of unpaid balance identified by the SBM data, in order to enhance the motivation of the team, but the response of customers has remained to be unfavorable without any remarkable change.

  This indicates that the improvement of water supply service should be preceded before the customer promotion campaigning, and a new strategy should be developed such as selecting the HHs in Makadara Shehia as the target of intensive campaigning, for which the water supply service have been improved or shall be improved in the near future by the Pilot Project.

(3)-5 Prepare the tariff revision roadmap that reflects cost-benefit analysis of NRW reduction activities in the Model System

- Simulation of Water Tariff

  The Experts prepared the simulation worksheets and the draft guideline for the proper tariff estimation. The draft revision plan prepared by AfDB was intended to simulate the tariff level in order to reduce the subsidy from RGoZ, whereas the simulated tariff in the Project is for sustaining the proper water supply service, keeping the fairness among the customers, avoiding transfer of the debt to the next generation and thus proposing a stepwise and long-term revision process. Table 2-10 shows the workflow of water tariff simulation with responsible persons in charge.

Table 2-09 Result of Customer Promotion Activity

Shehia	Distribution System	District	Customer Promotion and Updating SC Survey			
			Visited HHs		Input Manpower (net days, 1day=8hrs) B	B/A (HH/day)
			Turned to Registered A	Responded Sum		
Gulioni	Model	Urban	8	59	12	1.50
Jang'ombe		Urban		0		
Kikuwajuni Bondeni	Model	Urban		0		
Kikuwajuni Juu	Model	Urban		0		
Kilimani		Urban		0		
Kiponda	Model	Urban	3	26	10	3.33
Kisima Majongoo	Model	Urban		0		
Kisiwandui	Model	Urban		0		
Kwaalinatu		Urban		0		
Kwaalimsha		Urban		0		
Kwahani		Urban		0		
Makadara	Model	Urban		0		
Malindi	Model	Urban	2	19	8	4.00
Matarumbeta		Urban		0		
Mchangani	Model	Urban	8	137	44	5.50
Meya		Urban		0		
Miembeni	Model	Urban		0		
Migombani		Urban		0		
Mikunguni	Model	Urban		0		
Mkele	Model	Urban		0		
Mkunazini	Model	Urban	4	19	15	3.75
Mlandage	Model	Urban	8	67	14	1.75
Mpendae		Urban		0		
Mwembeladu	Model	Urban		0		
Mwembeshauri	Model	Urban		0		
Mwembetanga	Model	Urban		0		
Rahaleo	Model	Urban		0		
Shangani	Model	Urban		0		
Shaurimoyo	Model	Urban		0		
Urusi		Urban		0		
Vikokotoni	Model	Urban	16	65	18	1.13
Sum	21	31	49	392	121	2.47

Table 2-10 Workflow of Water Tariff Simulation

Person in Charge		Stage of Workflow			
		Planning			Monitoring
		Planning Information and Fundamentals		Tariff Simulation	Post and Feedback
DG and BODs	Directors of: TOD and WDD	**[Step-1]**: Current Situation of Facilities - Water Flow Balance - NRW Ratio - Performance - Operability - Past Investments - Potential of Water Sources - Potential of Water Allocation	**[Step-3]**: Project Fundamentals - Planning Year - Service Areas - Assumed NRW Ratio Improvement - No. of Customer by Tariff Categories - Collection Ratio by Tariff Categories - Implementing Plan - Project Cost and Counterpart Cost - Planned O&M Cost - Planned Revenue		**[Step-6.1]**: Physical Impacts - NRW Ratio - Reducing of Distribution Amount - Reducing of Allocation Amount - Reducing of O&M Cost
	Director of: CCSD	**[Step-2]**: Service Needs - Target Year - Target Area of Services - Population Projection - Service Coverage by Tariff Categories - Water Consumptions - Net Water Demand - Gross Water Demand			**[Step-6.1]**: Service Impacts - NRW Ratio - Increasing of Service Hours - Increasing of Service Pressure - Increasing of Metered Customers - Increasing of Billed Amount - Increasing of Collected Amount
	Director of: FAD	**[Step-4]**: Current Water Supply Cost within Project Area - Fixed and Variation Costs - O&M Costs - Current Financial Balance - Selection of Funding Source		**[Step-5.1]**: Cost Allocation - Cost Allocation by Tariff Category - Cost Allocation by Tariff Collected **[Step-5.2]**: Projected Financial Balance - Investment Fund Allocation - Ratio of Subsidy and Iquity - Long-term Projects Investment	**[Step-6.1]**: Re-allocation of Costs - Re-allocation by Tariff Category - Re-allocation by Tariff Collected **[Step-6.2]**: Feedback to the next Plan - Planning Information - Planning Fundamentals

The C/Ps and the Experts confirmed by using the worksheets that the entire expenditure can be covered by the tariff income (full cost recovery) within the jurisdiction of AfDB Project (Saateni System). The tariff level, therefore, shall be decided based on the result of tariff simulation within each systemized zone of UWS. The assumptions of the simulation are:

- 60 % of registered households shall pay the tariff;
- The unit volumetric charge for domestic usage shall be raised from the current 670 TZS/m^3 to 1,000 TZS/m^3 for domestic use.

ZAWA together with the Experts are required to use the worksheets for other projects and ZAWA should request ZURA to review the tariff system after the consent of the ZAWA Board.

(3)-6 Other Activities

- Bringing Up Trainers of Meter Reading

  Over hundred meter readers shall be needed for the meter reading and the following bill delivery after the completion of the AfDB loan project and the expected JICA loan project for which of the latter the preparatory survey started. The OJT training of meter reading can be conducted in the area of AfDB loan project, and the more trainers are needed for this purpose. In May 2016, the Experts started capacity building for the new trainers and one meter reader was supposed to fulfill the duty of trainer for other meter readers.

- Water Pressure Survey

  Prior to the beginning of the preparatory survey by JICA in April 2016, the Experts and C/Ps launched in January 2016 preparation of a distribution map showing the current water supply pressure. The purpose was to provide the said survey team with baseline information. Using the eight water pressure loggers purchased by the Project, the pressure and supply hours were measured for one week in the area that was expected to be the target of the survey. The analysis of the result and visualization was done by the C/Ps instructed by the Experts. Refer to the attachment at the beginning of this report.

(4) Output 4: NRW Management

(4)-1 Conduct surface leakage survey in UWS and pipeline repair in Pilot Area.

- OJT on Surface Leakage Survey

  Through the cooperation of the Experts and C/Ps, surface leakage survey was launched in the 2nd contract year in the UWS area. The OJT was consisted of (a) the preparation of draft survey form; (b) site pipeline survey; (c) development of a guideline for leakage detection; and (d) reparation of survey record. The first batch of round survey trip in the target area started in September 2013 and ended in January 2014.

  The location of the observed surface leakage was entered into GIS and was visualized as shown in Figure 2-06.

  The number of detected surface leakage event was 289, of which the share of pipe material was 31% for PE, 29% for ACP and 19% for VP dissentingly, followed by CIP and IP. No leakage was observed from DCIP.

  It can be concluded based on the opinion of the field surveyors of ZAWA that the water supply pressure was higher in places where the surface leakage was detected rather than in other areas. This suggests that the number of detected leakage shall increase when the water supply pressure is at normal level. And it is usual that other leakage events occur in the surrounding areas after completing the repair of the detected surface leakage.

Figure 2-06 The Distribution of Surveyed Surface Leakage

- OJT on Pipe Repair in Pilot Area

  Many of the surface leakage cases were observed in the Makadara pilot area. Having almost no stock of materials for repairing pipes, however, ZAWA procures the necessary materials for repair after identifying the type and diameter of pipe by test excavation, which hinders the immediate repair.

  The Experts and C/Ps conducted a series of test excavation in order to develop the pipe rehabilitation plan in the Makadara pilot area. Seventy six percent of the leaking was from the pipe joints, and 22% was from the bearing of valves, while 59% of the leakage was from distribution pipes and the 24% was from service pipes.

  The OJT of leakage repair was conducted as the repair practice of leakage. The leakage was detected by underground leakage survey where the pressure test failed to pass, following the completion of installing pipes in Makadara pilot area. Test excavation was followed before the leakage repair, for identifying the necessary pipe materials.

(4)-2 Prepare the standard drawings of piping works as a part of ZAWA's Technical Standards.

- Draft Technical Standard of ZAWA

  This standard is divided into 7 chapters i.e. (a) general terms e.g. water demand forecasting, related laws and regulations, etc.; (b) water resource development; (c) distribution reservoir tank; (d) chlorine disinfection equipment; (e) distribution network;

(f) service connection; and (g) water flow monitoring equipment.

- Standard Drawings

  The Experts and C/Ps prepared the standard drawings of distribution pipe, service connection and water flow monitoring equipment as a part of standard drawings for piping works.

  The remaining standard drawings shall be amended by collecting the preceding examples of other water utilities in Tanzania mainland and by cooperating with the designing consultant hired by other donors.

(4)-3 Formulate an operating procedure composing of surface leakage reduction and zoning works (DMA and LMB) in the Pilot Area, and replace pipelines and install water meters.

- Guideline for NRW Reduction

  Among the two categories of leakage i.e. physical loss and apparent loss, the Experts together with C/Ps started to establish the standard procedure of reducing physical loss in the 2nd contract year considering the current status of water supply facilities of ZAWA.

  The procedure consists of round trip and identification work of which the former is to repeat the cycle of surface/underground leakage detection and pipe repair, while the latter is to repeat the cycle of identifying the portion of pipeline with much leakage and pipe repair by tracking the defined route.

  The round trip is effective for the pipeline with much leakage, and the identification work should be followed after reducing the frequency of the leakage event. The tracking route in identification is either from the upper stream or from the zone with much leakage. The leakage includes the water theft through illegal connection.

  The methodology was developed for the classification and the zoning, in line with the identification work, particularly focused on the methodology of designing District Metered Area (DMA) and Leakage Monitoring Block (LMB).

- Pilot Zoning Work

  The pilot zoning work was started in the 1st contract year, and the three Shehias of Makadara, Bububu, and Tabeta were selected where water meter had been installed and service connection work had been finished. The procurement of valves for separation of the defined zone from other area as well as the installation of water flow monitoring equipment at the inlet point from other area were supposed to be conducted in the 2nd contract year.

  The Experts verified the original plan after the beginning of the 2nd contract year to find that it is simply a separation work from the surrounding network, not a part of integrated zoning work.

  The ROP was announced in the 2nd contract year for the selection of the designing consultant for AfDB project, and the Experts took this opportunity to propose to ZAWA that the Pilot Area shall be selected in line with the AfDB loan project. After the discussion with ZAWA, the Experts selected the Pilot Area as Makadara and Gulioni.

  In the latter half of the 2nd contract year, new Experts were dispatched to design the pilot zoning work and to estimate the necessary cost with cooperation of the C/Ps. The specification and quantity of necessary pipe materials were identified in February, 2014 and the Experts asked ZAWA to bear all the cost for procuring of the materials.

  Since the necessary cost was beyond the allowable limit that ZAWA can disburse, ZAWA immediately proposed to utilize the infrastructure fund of the RGoZ and requested the due allocation of the fund to the MoFP via MLWEE. The procurement was conducted immediately for a part of the pipes, but was delayed for the remaining pipes. The Experts

were forced to halve the Pilot Project area from the original Makadara and Gulioni to only Makadara, but it was further reduced to the northern half of Makadara due to the further delay.

The Pilot Project started in March 2015, a year after completion of the draft design by the Experts. The Experts explained to C/Ps the contents of the draft construction supervision plan, followed by how to operate the equipment, the preparation work of materials and the necessary number of laborers.

The installation of primary and secondary pipeline was completed in July 2016. After this, the pressure test, the cleaning and disinfection, and the installation of manifold meter and service pipe followed by the preparation of as-built drawings were conducted in line with the OJT on construction survey. This OJT includes aspects of not only the quality control but safety control and environmental control as well.

- Pipe Repair

The OJT on leaked pipe repair was included in the pressure test of the Pilot Project.

(4)-4 Design the draft project monitoring plan for the Model System and monitor leakage reduction works.

- Construction Supervision Plan

In the Pilot Project, the OJT on the preparation of construction supervision plan is included. The Experts explained to C/Ps the following management issues repeatedly:

- Prioritized control issues: safety control, quality control and schedule control;
- Unconditionally observed issues: environmental control and document control.

- Monitoring Indicators

The Experts prepared the recording format on Excel for monitoring the progress of the Pilot Project and shared the information with the C/Ps to enable the share of the challenges even when the Experts are not at site (refer to Table 2-11). The progress is to be assessed by the cash paid for the procurement and by the length of pipe for the installation.

Table 2-11 Progress Monitoring Sheet for Pilot Project

MONTHLY PROGRESS TABLE IN JULY 2016 (MAKADARA Pilot Area - 1) July 2016

Item	Description	unit	Planned (A)	Last mounth (B)		This mounth (C)		Cum. Total (D) = (B) + (C)			Remain: (E) = (A) - (D)			Remarks
				unit	(B/A) %	unit	(C/A) %	unit	(D*CUC) USD	(D/A) %	unit	(E*CUC) USD	(E/A) %	
1. Procurement														
Primary Line	DCIP DN400	m	403	403	100	0	0	403	0	100	0	0	0	Diversion from ZAWA 0 USD/m
Secondary Line	HDPE DN180 (1-batch)	m	292	292	100	0	0	292	15,768	100	0	0	0	Complex Unit Cost : 54 USD/m
	HDPE DN110 (1-batch)	m	678	678	100	0	0	678	12,290	100	0	0	0	Complex Unit Cost : 18 USD/m
Tertiary Line	HDPE DN90/75 (1-batch)	m	1,950	1,950	100	0	0	1950	39,000	100	0	0	0	Complex Unit Cost : 20 USD/m
Manifold	Manifold × 66 units (1-batch)	No	1	1	100	0	0	1	8,532	100	0	0	0	Complex Unit Cost : 8,532 USD/No
	Manifold× 66 units (2-batch)	No	1	0	0	0	0	0	0	0	1	55,462	100	Complex Unit Cost : 55,462 USD/No
Total payment (USD)			**131,052**						**75,590**	**58**		**55,462**	**42**	**Note: This cost is assumed using CUC.**
2. Installation														
Primary Line	DCIP DN400 ~ DN300	m	403	348	86	0	0	348		86	55		14	Include Valve Box
	sub-total	m	403	348	86	0	0	348		86	55		14	
Secondary Line	HDPE DN180	m	292	348	119	5	0	353		121	-61		-21	Include Valve Box
	HDPE DN110	m	678	688	101	0	0	688		101	-10		-1	Include Valve Box
	sub-total	m	970	1036	107	5	0	1041		107	-71		-7	
Tertiary Line	HDPE DN90	m	346	211	61	0	0	211		61	135		39	Include Valve Box
	HDPE DN75	m	1,918	914	48	0	0	914		48	1004		52	Include Valve Box
	sub-total	m	2,264	1125	50	0	0	1125		50	1139		50	
Service Connection	Maifold	Nos	66	1	2	0	0	1		2	65		98	Include Structure
	HDPE DN25 Service Pipe	Nos	66	0	0	0	0	0		0	66		100	187 m/No × 66 Nos = 12,342 m
	sub-total	Nos	132	0	0	0	0	0		0	131		99	
Miscellaneous		Nos	19	0	0	0	0	0		0	19		100	LMB, Cannal Cross, Ex Connection

(4)-5 Encode information of distribution facilities, survey results and construction records in GIS.

- Information Management after Classification and Zoning

  The current information of distribution facilities have been entered into GIS without the definition of conduit pipe, transmission pipe and distribution pipe. Mterial and diameter have not been recorded for some pipes.

  After developing the scope of classification and zoning, modification of entered data shall be necessary according the category of node such as primary, secondary, tertiary, and service pipes. This facilitates development of a prioritized pipe rehabilitation plan by utilizing the indicator of the leakage density which is calculated by dividing the number of leakage cases by the length of pipelines.

(4)-6 Coordinate NRW/ leakage reduction projects assisted by other donors.

- PMU

  The financial assistance by AfDB and technical assistance by the Project have cooperated with each other for the NRW reduction project by ZAWA. But since ZAWA is not accustomed to project management, the Experts continued the technical support focusing on the following topics:

  - Planning management: the master plan and the project plan should be superior and ZAWA should learn that planning management is important.
  - Technical management: ZAWA should learn that the management of contractor using technical specifications and drawings is important for construction management.
  - Contract management: ZAWA should understand well the contract that should be observed, such as the agreed contract text, procedure, obligation and payment.

(4)-7 Other Activity

- Evaluation of OJT accomplishment for GIS operators

  The OJT for GIS operators of ZAWA was conducted for two and half years through daily activity. The OJT expert on GIS employed by the Project is from Kenya and speaks Swahili as his mother tongue. In addition he was an ex-staff of the distribution agency of ESRI GIS software in Africa region, and masters the GIS operation than anyone else. The Project handed the evaluation report of OJT for GIS operators to ZAWA at its final stage.

2.4 Major Events

The major events are described below under the two categories of training and others.

(1) Management Activity

The number of ZAWA staff dispatched to training in the Project is shown in Table 2-12.

Table 2-12 Number of ZAWA Staff Dispatched to Training

Summary	Domestic	Third Country
Venue	Arusha Urban Water Supply and Sewerage Authority, in which the main water source is spring and of which service area is the skirts of Mt. Kilimanjaro	Ministry of Water and Irrigation of Jordan, for which the main water source is borehole and of which water supply service is provided by the scheme of PPP.
Date	June 2012	January 2015
Participants	8 from ZAWA, of which 2 directors, 4 officers and 2 staffs	3, of which 1 from MLWEE, 1 ZAWA director and 1 ZAWA staff.
Dispatched Days	4 days	10 days
Objective	Site visit and information exchange	Site visit and information exchange

(2) Other Activity

In addition to the training program provided by JICA in Japan as shown in Table 2-13, the Project received the trainees of JICA i.e. the internship personnel of JICA, the on-site OJT training of JICA staff, the internship university student by JICA program and the personnel of Yokohama Waterworks Bureau dispatched under the scheme of JOCV.

Table 2-13 Number of Staff Dispatched to Japan for Training

Training Program	2011	2012	2013	2014	2015	2016*[1]
Water Supply Administration	1	1	1		1	1
Waterworks Engineering	1	1				
Comprehensive Engineering on Water Supply System			1	1	2	1
African Region Urban Waterworks	2	1	1	2	1	1
NRW Management	1	1	1		1	1
O&M of Urban Water Supply			1	1	1	1

Note*[1]: Training staff in JFY 2016 is proposed by the Team to JICA Tanzania Office.

JICA side procured equipment to be used for the activities in the Project. The equipment is listed in Table 2-14.

Table 2-14 List of Procured Equipment

No.	Equipment	Model	Q'ty	Procurement Period	Place	Status
1	Portable Ultrasonic Flowmeter	TOKYO Keiki UFP-20	2	1st Year	Expert Office	under repair; to be handed-over in Oct-2016
2	Water Leak Detector	FUJITECOM HG-10A11	2	1st Year	Expert Office	under usage
3	Diaphragm Listening Stick	FUJITECOM LSP-1.5m	2	1st Year	Expert Office	under usage
4	Diaphragm Listening Stick	FUJITECOM LSP-1.0m	3	1st Year	Expert Office	under usage
5	Digital Sound Detector	FUJITECOM FSB-8D	2	1st Year	Expert Office	under usage
6	Metal Locator	FUJITECOM F-90M	1	1st Year	Expert Office	under usage
7	Pipe Detector (Non-Metal)	FUJITECOM NPL-100	1	1st Year	Expert Office	under usage
8	Boring Bar	FUJITECOM 1.0 ml	1	1st Year	Expert Office	in stock
9	Hammer Drill	HITACHI PR-38E	1	1st Year	Expert Office	in stock
10	Hexagon Drill Bit	YUNIKA HEXELL 800mm	5	1st Year	Expert Office	in stock
11	Manual Drill	TABUCHI DAS	1	1st Year	Expert Office	in stock
12	Generator	HONDA Eu20i EAATI-1445047	1	1st Year	Expert Office	under usage
13	Water Meter and Meter Installation Material	-	800	1st Year	Installed	Makadara and Bububu
14	PC	-	1	1st Year	Office of Commercial Director	under usage
15	Meter Reading Terminal	PS100 Workabout	10	1st Year	Office of Data Management	Non-use
16	Copy Machine	CANON Image Runner 2520	1	1st Year	Expert Office	under usage
17	Pressure Data Logger	Textlog TL2-M-L-121-1BO-X-X	2	2nd Year	Expert Office	under usage
18	Pipe Locator	FUJITECOM PL-960	1	2nd Year	Expert Office	under usage
19	Satellite Image	2012 Complex Image	1	2nd Year	Installed	GIS
20	Walking Distance Meter	-	4	3rd Year	Expert Office	under usage
21	GPS (Survey)	GARMIN Ctrex-10	4	3rd Year	Expert Office	malfunctioned
22	GPS (As-built Drawing)	Trimble	1	4rd Year	Expert Office	under usage
23	Camera	SONY Cybarshot DSC-W730	4	3rd Year	Expert Office	3: malfunctioned 1: under usage
24	Pressure Data Logger	Textlog TL2-M-L-121-1BO-X-X	6	3rd Year	Expert Office	under usage
25	Butt Fusion Machine	GF 250	1	3rd Year	Saateni Warehouse	under usage
26	Engine Generator	SH 7600 EX	1	3rd Year	Saateni Warehouse	under usage
27	Compactor (middle)	90 kg	2	3rd Year	Saateni Warehouse	under usage
28	Compactor (small)	40 kg	2	3rd Year	Saateni Warehouse	under usage
29	Pipe Cutter	-	1	3rd Year	Saateni Warehouse	under usage
30	Asfalt Cutter	-	1	3rd Year	Saateni Warehouse	under usage
31	Pump (de-watering)	-	1	3rd Year	Saateni Warehouse	under usage
32	Pump (pressure test)	-	1	3rd Year	Saateni Warehouse	under usage
33	Concrete Mixer	-	1	3rd Year	Saateni Warehouse	under usage
34	Tools for Piping Work	wrench, spanners, etc.	1	3rd Year	Saateni Warehouse	under usage
35	Meter Reading Terminal Smart-phone Type	Samsun Galaxy J5	10	3rd Year	Expert Office	under usage
36	Bill Printer	HP Laserjet 60 AN	2	3rd Year	Office of Data Management	under usage

.....

Chapter-3
Evaluation and Recommendations

In this chapter, operational ingenuity and lesson learned through the entire activities of the Project are described. Additionally, recommendations are made for achievement of the overall goal and continuation of the activities in $PDM_{3\text{-}5}$.

3.1 Evaluation through the Activities of the Project

(1) Operational Ingenuity

Following items are exercise ingenuity of the Team under the project operation:

Communication between Concerns

The Team has operated the Project by group management composed of the chief and the deputy chief in the 1st and the 3rd fieldworks. JICA Consultation Mission in the 1st fieldwork suggested that coordination among Zanzibar, Japan and other donors was not conducted by the Team. ZAWA was recommended to communicate with other donors by the said mission.

In the 3rd fieldwork, the Team set up the project operation structure with due consideration of the suggestion of the JICA mission from the 1st fieldwork. Communication networks were divided into two; an external networks (JICA, MLWEE and Donors) the chief adviser and as an internal networks (ZAWA, the Team and NJS) by the deputy chief adviser. These two networks are connected within the Team.

For the external communication, the Team exercise ingenuity of following:

- Conception: The Team judged PDM_1 that its activities were all round and not specified to solve the urgent challenges of ZAWA, and that the outputs could not be achieved through the activities. The Team communicated with JICA and the revision of PDM was realized.
- Coordination: The NRW reduction project normally requires a large amount of investment. The Team considered that JICA Experts assist ZAWA technically and the AfDB may assist ZAWA financially. The NRW reduction project of AfDB was commenced in the 2nd fieldwork. The Team expected the synergistic effect through both assistances. Consequently, the concept of AfDB loan project was replaced by the systemization of distribution facility. However, repair materials of pipeline based on the surface leakage survey was not adopted.

For the internal communication, the Team exercise ingenuity of following.

- ZAWA C/Ps: Work coordination between ZAWA and the Team has been fallen on Deputy Chief Adviser. General evaluation of the JMTE mentioned that communication was improved drastically. Especially through the planning OJT for middle management and the negotiation of organogram restructuring and staff allocation, joint activities by ZAWA C/Ps and the Team have been created smoothly.
- Allocation: Allocation of limited experts to the activities shall be identified as its importance and timing. When ZAWA commenced the NRW project under AfDB loan, the Team proposed to assist ZAWA technically. The Team accessed to JICA and arranged experts newly in January 2014 before commencement of the ZAWA's activities in May 2014.

Applied Method of Activity

At the 2nd fieldwork, the Team changed the style of activity from PDCA to JOT as mentioned in 1.3 (1).

(2) Lesson Learned from the Project

Following are acquired lessons learned by the Project activities.

- Initial PDM: The Team proposes that the initial PDM shall have "Overall Goal" and "Project Purpose" only, and "Outputs" are setup the items provisionally. When the Team is dispatched to the field, the teams of C/Ps and Expert finalized the activities with due consideration of localities and project ownership of counterpart.
- Fieldwork Period: Corresponding to the revision of PDM or the activities, it is convenient to have a longer period of the fieldwork for arrangement of the Experts and input timing flexibly.

3.2 Recommendations for Achievement of Overall Goal

The verifiable indicators and the target values of overall goal in $PDM_{3\text{-}5}$ i.e. "ZAWA's water supply services are improved" are as below:

- Water supply services in the Model System are improved in terms of supply hours and water pressure (by 2018 upon the completion of AfDB project):

  Supply Hours: 12 hours/day (baseline: 8 hours/day as of 2014)
  Supply Pressure: 7 mH_2O (baseline: 2 mH_2O as of 2014)

- The billing and collection in the Model System are improved (by 2018 upon the completion of AfDB project):

  By customers: 80 % (baseline: 16% as of 2014)
  By amount 90 % (baseline: 13% as of 2014)

To achieve these targets, it is necessary to complete the AfDB project successfully, as well as to continue and extend data management, organization restructuring and customer management in order to ensure the sustainable O&M of the facilities. From this point of view, the Team recommends that ZAWA shall implement the following activities based on the outputs of the Project.

(1) Output-1: Information Management

<Expansion of MIS>

Available KPIs shall be drastically increased upon completion of the loan projects of on-going AfDB and expected JICA. It is recommended that ZAWA shall collect the information in line with MIS of which example is shown below, and utilize it for its management:

• CAPEX:	1. Cost of New Well	categorized by well-fields
	2. Cost of Piping Works	categorized by materials and diameters
	3. Cost of Reservoirs	categorized by type and volume
	4. Cost of M&E	categorized by pump and monitoring device
	5. Cost of SC	categorized by diameter and meter type
• OPEX:	1. Cost of Manpower	categorized by rank and quantity
	2. Cost of O&M	categorized by materials and diameters
	3. Cost of Chemicals	categorized by chlorination and reagent
	4. Cost of Power	categorized by intake and others
• Amount of Water:	1. Intake Production	actual data by well fields
	2. Distribution	actual data by systemization
	3. Supply	actual data by zones of DMA and LMB

	4. Consumption	actual data by diameter of service connection
• Tariff Income:	1. Billing	number and amount of billing by LMB
	2. Collection	number and amount of collection by LMB

<Phase-based Improvement of ICT>

It is necessary to improve the ICT hardware and software in ZAWA for the efficient and accurate data management including MIS. Based on the result of the study by ZAWA's C/Ps and the Team, it is recommended that ZAWA shall introduce and/or expand additional software, hardware and web network and train the relevant staffs in a phased manner.

<Preparation of Mid-term Business Plan>

The previous 2 versions of mid-term plan of ZAWA were prepared by the assistance of donors. Based on the experience of ABP and AR which are prepared by ZAWA C/Ps, it is recommended that ZAWA shall develop the next five years plan for ZFY-2018-2022 for enhancing the ownership and the management capacity.

The information necessary to develop the mid-term plan can be acquired from MIS and current situation analysis. After making clear the assistance and its expected period from donors, it is easy to identify the tasks to be done in each year based on the prospect in the target year. By following this step, ZAWA staff can develop the mid-term plan even though it takes due time.

(2) Output-2: Human Resources Management

<Flexible Reform the Organogram>

Organogram is not fixed and it should be changed according to the needs of the management of the utility. Small scale of changing can be approved by the Management. Large changes, on the other hand, can be implemented by approval of the Board. For example, the decentralization idea of District Offices can bring results to O&M and tariff income, which was proposed by the ZAWA C/Ps and the Team. Therefore, the Management of ZAWA shall identify the priority items according to the result of MIS analysis.

<Periodical Revision of Scheme of Service>

The Scheme of Service shall be reviewed periodically including recruitment, promotion, duties, and business results. Evaluation scale of these items are reflected and coordinated with the Scheme of Service. In this regard, job description and salary shall be revised and used as a tool for human resources planning.

(3) Output-3: Customer Management

<Management of Customer Information: SC Survey, Customer Promotion and Monthly Monitoring>

The validation and updating of SBM_2 data by collating it with the result of SC survey is the most important step to link SC survey to revenue increase. To establish a reliable customer database is the basis of activities related to new connections, meter installation and bill delivery and collection which are expected to increase in UWS area in the near future. Therefore, it is recommended that the Management Team shall encourage close communication among concerned sections and monitor the progress periodically in order to complete the validation and updating as soon as possible.

<Improvement of Tariff Collection Method>

ZAWA has only three tariff pay windows within the UWS area. Upon improvement of physical services, the collection ratio of 90% may be difficult to achieve. Because of limited times up to the physical service improvement, the Management of ZAWA shall examine the demand orientation methods such as M-pesa, Pre-paid Meter, etc.

(4) Output-4: Leakage Management

<Project Management Unit: PMU>

PMU is composed of Management Team and Officers. For the successful completion of AfDB project and other prospected projects, it is recommended that the capacity of PMU shall be strengthened regarding the factors shown in Table 3-01, or the task of PMU shall be outsourced.

Table 3-01 Proposed Items to Strengthen PMU's Capacity

Management Skill	Proposed Capacity
Planning	Planning Concepts of Loan Project, Control of Consultants and the Contractor, Coordination of the on-going Project and the other project, etc.
Technical	Basic Knowledge of Water Supply Technology, Construction Supervisions such as Controls of Safety Quality, Schedule, Environment and Documents including periodical project monitoring.
Contract	Together with planning and technical management, international contract management shall be studied including (1) conditions, (2) obligations, (3) approval process, (4) payment, (5) design change, (6) BOQ change, etc.

< Training for Plumbers>

The capacity development of plumbers is necessary together with the standardization of materials for effective reduction of actual leakage. In Zanzibar there is no pubic licensing system for plumbing, and thus no authorized certificate is available to prove the skill of plumbers. As described in 2.3 (2), Mtoni Training Center is planned to be authorized as a public educational institute, and the training and licensing program for plumbers should be added in its curriculum at that time.

<Operation Plan on Installation of Meter and Service Pipe>

The project purpose is to reduce NRW (leakage from the pipeline networks). In this regard, the amount of leakage can not be reduced without replacing the deteriorated pipelines with new pipelines. It means in the case of AfDB Project that effectiveness of the AfDB Project can not be observed until ZAWA completes to install the meter and service pipes to the registered customers. Materials were procured under the AfDB Project. ZAWA is requested to make the operation plan on SC installation.

ZAWA shall consider that in the Stone Town, the spaces for Manifold to be installed may be limited because of very narrow footway and SC connection can be installed for registered customers.

.....

Chapter 4 Reference Materials

4.1 Project Operation and Management

(1) PDM_{3-5}

Project Design Matrix 3-5 (PDM_{3-5})

Project Title: Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 | Target Group: ZAWA staffs in Unguja Island | Version No.8
Project Period: November 2011 – October 2016 (5 years) | Project Area: Unguja, Zanzibar | Date: 30-March 2016

NARRATIVE SUMMARY	VERIFIABLE INDICATOR	MEANS OF VERIFICATION	ASSUMPTIONS
【Overall Goal】 ZAWA's water supply services are improved.	1. Water supply services in the Model System are improved in terms of supply hours and water pressure as follows. • Supply hours (average): 8 hrs/day (baseline) 12 hrs/day (target) • Supply pressures (minimum at No.8): 2 mH_2O (baseline) 7 mH_2O (target) 2. The billing and collection in the Model System are improved as follows. • Ratio of collected/ billed customers: 16 % (baseline) 80 % (target) • Ratio of collected / billed amount: 13 % (baseline) 90 % (target)	MIS Report (monthly) Baseline Report (periodically)	
【Project Purpose】 ZAWA's management capacity through NRW reduction activities is improved.	1. ZAWA's NRW reduction project, in collaboration with JICA Technical Cooperation, is commenced. 2. ZAWA's ABP with annual planned budgets is allocated with due consideration of overriding priority for ZAWA's utility operation.	Annual Business Plan and Annual Report	Terms of reference for ZAWA's consultants and project components are approved by the RGoZ.
【Output】 1. ZAWA's capacity of information management is enhanced.	1. MIS report is compiled on monthly basis and utilized by the management of ZAWA. 2. ZAWA's ABP is prepared and utilized for budget management for leakage reduction activities under JICA Technical Cooperation.	Annual Business Plan and Annual Report	The phasing out of government subsidies to ZAWA is conducted with due consideration of ZAWA's financial condition.
2. ZAWA's capacity of human resources management is improved.	1. Revised organization structure is approved by ZAWA board. 2. Amendment of staff rules and regulations is approved by ZAWA board.	Report of ZAWA's Board Meeting	
3. ZAWA's capacity of customer management is improved.	1. All customers (approximately 9,400 HHs) in Model System are newly registered into SBM-GIS. 2. Meter reading number per party in Model System is improved from 200 to 400 HHs/month. 3. The billing ratios in the Pilot Area are improved as follows. • Ratio of billed customers: 86.3 % (baseline) 95 % (target) • Ratio of billed amount: 93.7 % (baseline) 98 % (target)	Monthly MI Report	
4. ZAWA's capacity to plan and implement leakage reduction activities is enhanced.	1. Preliminary plan on leakage reduction is incorporated to ABP 2. ZAWA reflects operating procedure in Pilot Area to the design report for ZAWA's Project under the other donor loan. 3. ZAWA staff members become qualified in conducting: (1) leakage detection 2 persons, (2) pipe placement/ replacement/ repair 10 persons, (3) service connection 4 persons, and (4) construction quality control 2 persons.	Tender Documents of ZAWA Project Evaluation Records (Expert) - Scoring by trainers - Participation record	

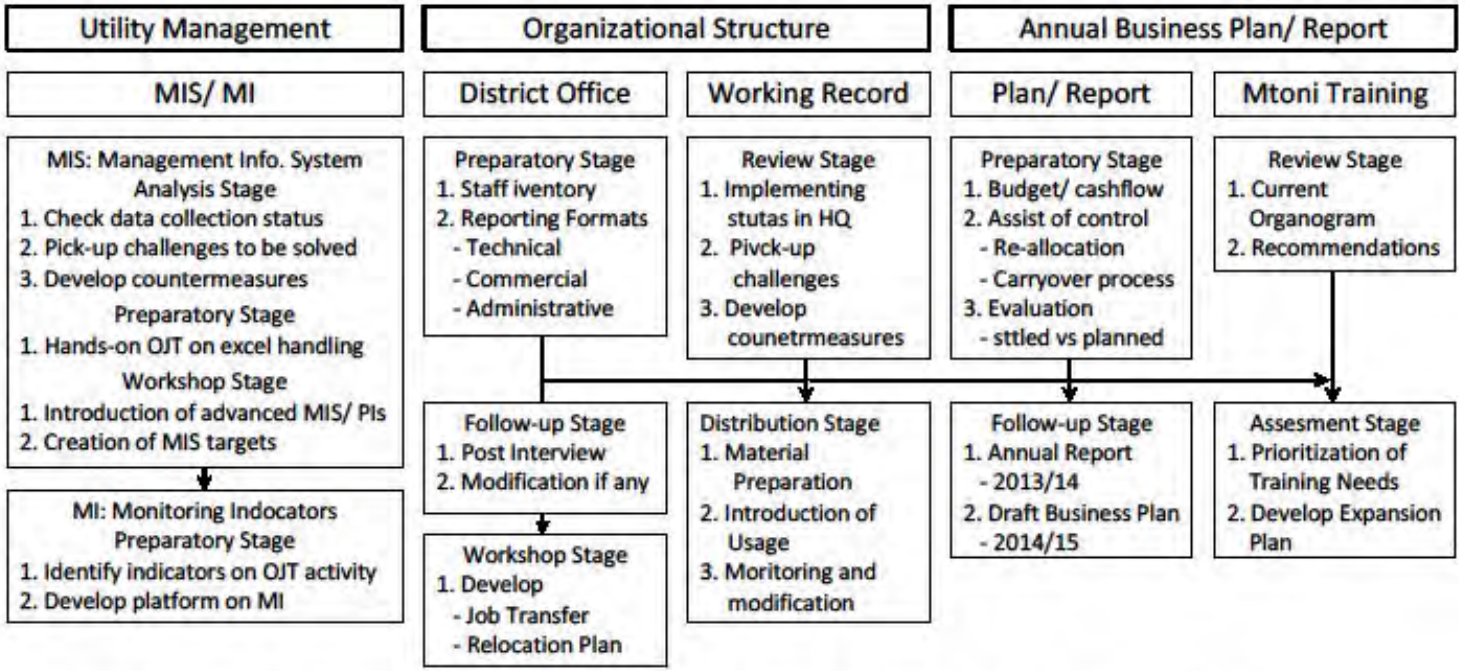
【Activity】	**【Input】**		
1-1 Define KPIs of WUM and monitoring indicators of activity in PDM, and collect and analyze them monthly. 1-2 Establish MIS for comparison of KPIs in ZAWA and other utilities. 1-3 Strengthen the budgetary control through planning of "NRW reduction activities in UWS" which will be incorporated into the ABP.	【Japanese side: JICA】 • Personnel - Experts in the fields of; ➢ Chief/ Vice-chief Advisor ➢ Water Utility Management ➢ Customer Management ➢ GIS Management ➢ NRW Management - Outsourcing ➢ National Expert for OJT Activities ➢ Test Excavation/ Baseline Survey • Equipment - Leakage Detectors - Measuring Instruments (pressure, water level, etc.) - WaterGEMS (with PC and Monitor) - WaterCAD (with PC and Monitor) - Installation Tools for Pipeline and Water Meter - Instruments for Piping Works and Quality Control • Materials - Public Relations materials - SBM-GIS Integration Cables, etc. • Training - In Japan - At Third Country	【Tanzanian side: ZAWA】 • Personnel - Taskforce Counterparts in the fields of: ➢ Organizational Structure Reform ➢ MIS/ MI Improvement ➢ Annual Business Planning ➢ Human Resources Development ➢ Customer Management ➢ Billing Operation ➢ SBM-GIS Operation ➢ NRW Reduction ➢ Facility Planner (designing and cost estimation) ➢ Project Management Unit for other Donor Assistance - Installation (replacement and repair) ➢ Distribution Pipeline and Service Connections - Field Surveys ➢ Pipeline Route Survey ➢ Baseline Survey • Manpower with Equipment and Materials - Servers of GIS and SBM with Plotter - Piping Works - Pipes and Service Connection with Meters • Others - Office Space - Vehicles (2)	ZAWA staff members allocate sufficient time for project activities. **【Pre-conditions】** ZAWA is going-concern institute.
2-1 Develop a revised organization structure with transitional plan.. 2-2 Propose plan for improving recruitment, allocation and management of staff in ZAWA HQs and District Offices. 2-3 Review the training policy, prepare and implement yearly staff training program. 2-4 Review and propose amendment of staff rules and regulations.			
3-1 Register all households in UWS and customers in the Model System into SBM-GIS and update them. 3-2 Improve the existing bill collection guideline. 3-3 Improve billing activities (from meter-reading to invoicing) within the Model System. 3-4 Enhance public relations to increase the sales of water. 3-5 Prepare the tariff revision roadmap that reflects cost-benefit analysis of NRW reduction activities in the Model System.			
4-1 Conduct surface leakage survey in UWS and pipeline repair in Pilot Area. 4-2 Prepare the standard drawings of piping works as a part of ZAWA's Technical Standards. 4-3 Formulate an operating procedure composing of surface leakage reduction and zoning works (DMA and LMB) in the Pilot Area, and replace pipelines and install water meters. 4-4 Design the draft project monitoring plan for the Model System and monitor leakage reduction works. 4-5 Encode information of distribution facilities, survey results and construction records in GIS. 4-6 Coordinate NRW/ leakage reduction projects assisted by other donors.			

* ABP: Annual Business Plan, KPI: Key Performance Indicator, MI: Monitoring Indicator, MIS: Management Information System, NRW: Non-revenue Water, OJT: On-the-Job-Training, RGoZ: the Revolutionary Government of Zanzibar, RWS: Rural Water Supply, SBM: Smart Billing Manager, UWS: Urban Water Supply, WUM: Water Utility Management, ZURA: Zanzibar Utilities Regulatory Authority, Model System: Saateni System, Pilot Area: Northern Half of LMB zone mainly at Makadara Shehia

(2) Workflow of each Output

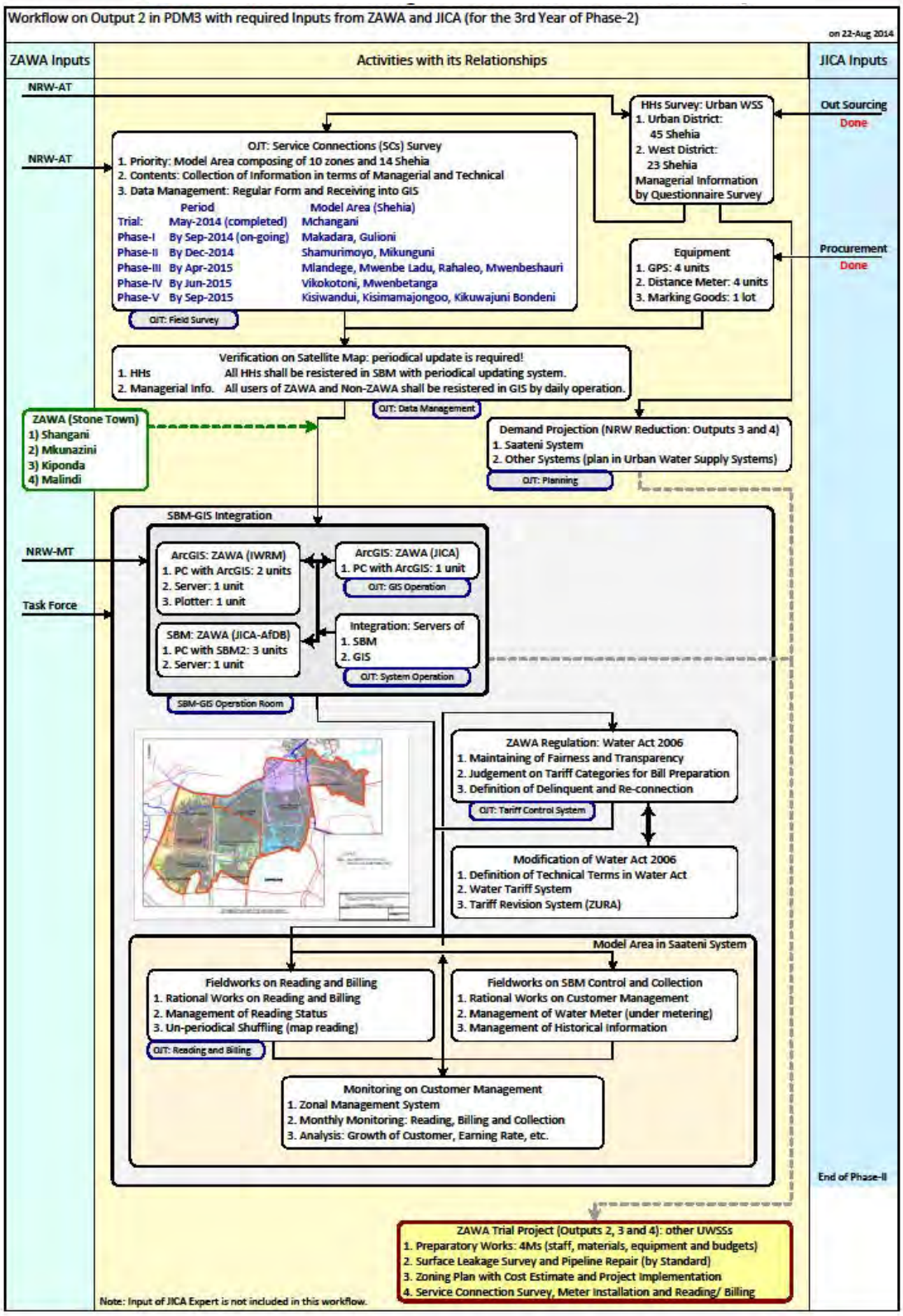
Workflow of Outputs -1/-2 Activities based on PDM_3

Dated on 22-August 2014

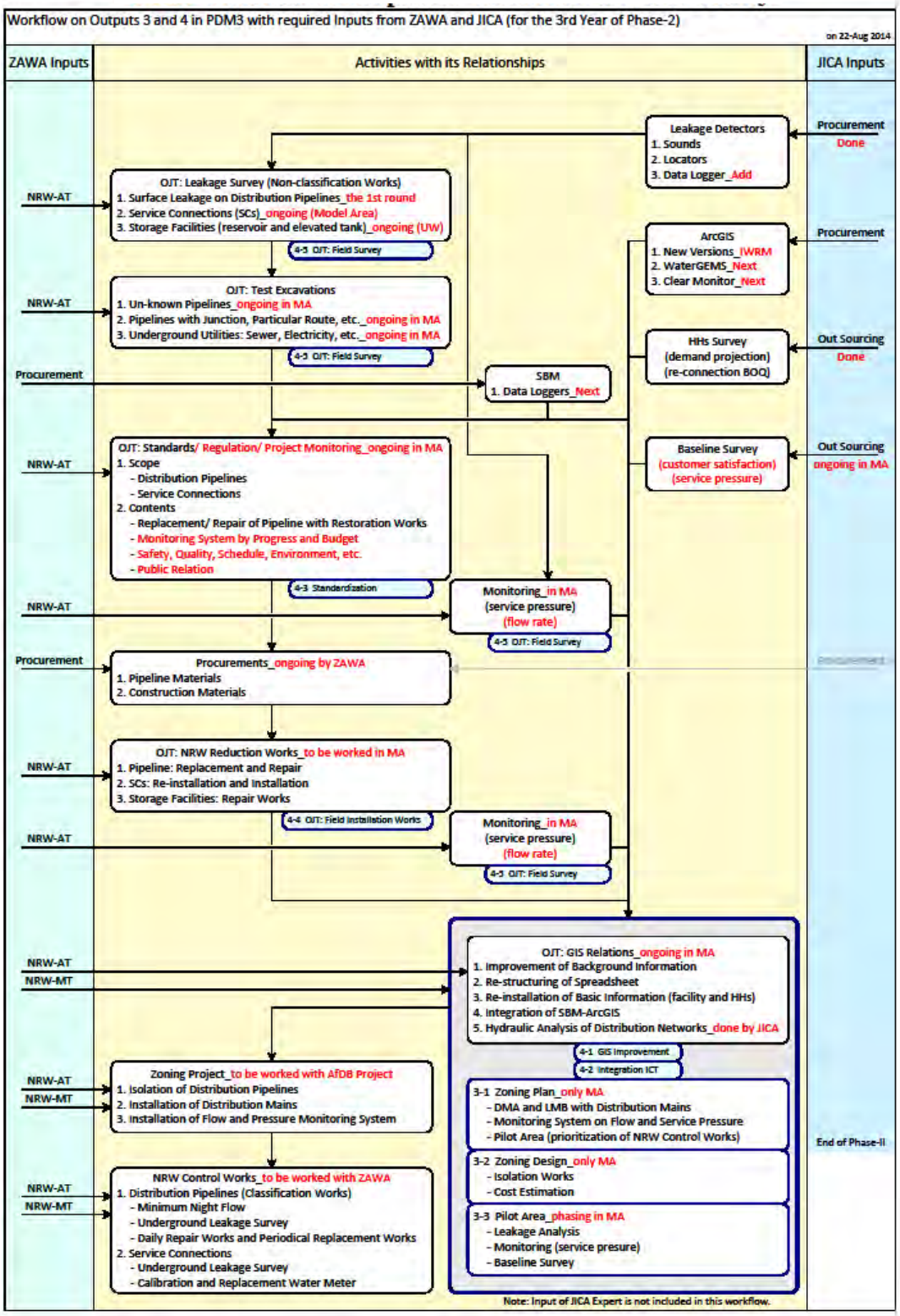


Note: Tariff Revision would be considered with due consideration of NRW Reduction and Tariff Collection Progresses (financial feasibility).

Workflow of Output-3 Activities based on PDM_3



Workflow of Output-4 Activities based on PDM_3



4.2 Work Schedule and List of Attendants

(1) International Expert and OJT Expert

4.2(1) Manning Schedule

1. Fieldwork (1st year)

Name of Expert (Major Task)	Contrast	2011 Sep	Oct	Nov	Dec	2012 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2013 Jan	Feb	Mar	Apr
Nobuyuki Gonohe	Plan																				
(Chief Advisor/ NRW Management)	Actual																				
Toru Suetake	Plan																				
(Deputy CS/ WU Management)	Actual																				
Shusaku Ueno	Plan																				
(Mapping/ SP Inventory Control -1)	Actual																				
Masami Tsuyuki	Plan																				
(Mapping/ SP Inventory Control -1)	Actual																				
Takanori Nemoto	Plan																				
(Mapping/ SP Inventory Control -2)	Actual																				
Naoto Koike	Plan																				
(Mapping/ SP Inventory Control -1)	Actual																				
Kiyoshi Kiyama	Plan																				
(Leakage Detection)	Actual																				
Nobuyuki Aoki	Plan																				
(Customer Service)	Actual																				
Yoko Miura	Plan																				
(Customer Service)	Actual																				
Hideyuki Takagi	Plan																				
(Customer Service)	Actual																				
Takashi Watanabe	Plan																				
(Customer Survey)	Actual																				

Legend: Actual by NJS

Outputs (Reports)																				
			△			△									△					△
			IC/R			PR-1									PR-2					PR-3

4.2(1) Manning Schedule

1. Fieldwork (2nd year)

Name of Expert (Major Task)	Contrast	2013 Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2014 Jan	Feb	Mar
Nobukatsu Sakiyama	Plan												
(Chief Advisor/ NRW Mngt/ Customer Mngt)	Actual												
Takehiko Ogawa	Plan												
(Water Utility Mngt-1/ Finance)	Actual												
Toshihiko Tamama	Plan												
(Water Utility Mngt-2/ Organization)	Actual												
Hideyuki Takagi	Plan												
(Customer Service)	Actual												
Takashi Watanabe	Plan												
(Customer Survey)	Actual												
Kazumi Suwabe	Plan												
(GIS-1)	Actual												
Naoto Koike	Plan												
(GIS-2/ NRW-2)	Actual												
Yukio Kemi	Plan												
(GIS-3/ NRW-3)	Actual												
Kiyoshi Kiyama	Plan												
(NRW-1)	Actual												
Ooka Toshiaki	Plan												
(NRW-4)	Actual												

Legend: Plan Actual by NJS

Outputs (Reports)					IC/R			JCC	PR-4			JCC	PR-5

4.2(1) Manning Schedule

1. Fieldwork (3rd year)

Name of Expert (Major Task)	Contrast	2014 May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2015 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2016 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Nobukatsu Sakiyama	Plan																														
(Chief Advisor/ NRW Management-1)	Actual																														
Toshihiko Tamama	Plan																														
(Deputy CS/ WU Management-1)	Actual																														
Hideyuki Takagi	Plan																														
(WU Management-2)	Actual																														
Natsuki Shimegi	Plan																														
(WU Management-3)	Actual																														
Fatemeh Masouleh	Plan																														
(WU Management-4)	Actual																														
Rie Yamaguchi	Plan																														
(WU Management-5)	Actual																														
Masami Ota	Plan																														
(CM-1)	Actual																														
Nobushige Shinohara	Plan																														
(CM-2) (predecessor)	Actual																														
Ken Takeuchi	Plan																														
(CM-2)	Actual																														
Kazumi Suwabe	Plan																														
(GIS Management-1)	Actual																														
Naoto Koike	Plan																														
(GIS Management-2/ NRW Management-3)	Actual																														
Yukio Kemi	Plan																														
(GIS Management-3/ NRW Management-4)	Actual																														
Kiyoshi Kiyama	Plan																														
(NRW Management-2)	Actual																														
Toshiaki Ooka	Plan																														
NRW Management-5)	Actual																														
Hideaki Takahashi	Plan																														
(NRW Management-6)	Actual																														

Legend: Plan Actual by NJS

2. Homework

Nobukatsu Sakiyama	Plan																														
(Chief Advisor/ NRW Management-1)	Actual																														
Toshihiko Tamama	Plan																														
(Deputy CS/ WU Management-1)	Actual																														
Naoto Koike	Plan																														
(GIS Management-2/ NRW Management-3)	Actual																														

Outputs (Reports)	△			▽		△				△	△			▽		▽	△							▽				▽		▽	
	Work Plan (JPN)					PR-6			Work Plan (ENG)		PR-7			JCC 8		JCC 9	PR-8							JCC-10			JCC-11		JCC-12		
				Consultation Mission								Terminal Evaluation																				

(2) List of Counterparts from ZAWA

4.2(2) List of Counterparts

OJT for Output-3: Customer Management
Ali Said Mohamed
Hassan Haji Kongo
Abdulbari Kai Haji
Hassan Mustafa Hassan
Lutfia Is-haka Ukasha
Khamis Ame Mnubi
Wahida Abdalla Mohamed
Idd Khalfan Idd
Abdillahi Badru Ali
Mohamed Hamdu
Mohamed Ali Suleiman
Hafidh Salum Suleiman
Hafidh Ali Mgeni
Hafsa Mwalim Abdalla
Salha Abdalla Haji
Fatma Juma Juma
Ali Juma Zubeir
Said Iddi Haji
Munira Issa Hakim
Mwatum Swelum Ali
Mattar Mohammed Yussuf
Hafidh Muumin Ali
Hadiya Muhsin Juma
Saidi Mussa Khamis
Mohammed Ali Khamis
Kombo Ali Hassan
Hisham Mabrouk Khamis

OJT for Output-4: Leakage Management
Ali Said Mohamed
Hassan Haji Kongo
Rukia Masheko Ali
Bakari Juma Bakari
Masoud Kombo Masoud
Hafidh Hassan Mwinyi
Hassan Haji Kongo
Abdulbari Kai Haji
Masoud Ali Haji
Bilal Khalid Abass
Mohamed Hamdu
Mohamed Ali Suleiman
Hafidh Salum Suleiman
Said Idd Haji
Mwinyi Hassan Hakim
Iddi Khalfan Iddi
Hadia Muhsin Juma
Hafidh Muumin ALi
Abdillahi Badru Ali
Ali Juma Zubeir
Makame Haji Iddi
Noora Issa Abdalla
Vuai Jabir Yagae
Mtumwa Ali Kilosa
Kazija Ame Thabit
Khamis Juma Khamis
Mohammed Hamdu Haji
Hafidh Hassan Mwinyi
Issa Abdalla Dawa
Haji Ali
Salum Uledi Juma
Ali Hussen Haji
Masoud Ali Haji
Ali Khamis Juma
Vuai Mussa
Said Khamis Ali
Mohammed Ali Khamis

(3) List of Counterparts nominated for Training in Japan and in the Third Country

4.2(3) Training in Japan

JFY	Training Program Name		No. of Participants
2011	上水道技術者	Waterworks Engineering	1
2011	上水道無収水量管理対策（漏水防止対策）	Non-Revenue Water Management (Leakage control)	1
2011	アフリカ地域都市上水道技術者養成	African Region Urban Waterworks Engineering	2
2011	水道管理行政	Water Supply Administration for Better Management of Water Supply Services	1
2012	水道管理行政（A）	Water Supply Administration for Better Management of Water Supply Services（A）	1
2012	上水道技術者	Waterworks Engineering	1
2012	上水道無収水量管理対策（漏水防止対策）	Non-Revenue Water Management (Leakage control)	1
2012	アフリカ地域都市上水道技術者養成	African Region Urban Waterworks Engineering	1
2013	上水道無収水量管理対策	Non-Revenue Water Management (Leakage Control)	1
2013	アフリカ地域都市上水道技術者養成（A）	Afrecan Region Urban Waterworks Engineering	1
2013	水道管理行政及び水道事業経営（A）	Water Supply Administration for Better Management of Water Supply Services (A)	1
2013	都市上下水道維持管理（給・配水）（A）	Operation and Maintenance of Urban Water Supply System (Water Distribution and	1
2014	上水道施設技術総合（B）	Comprehensive Engineering on Water Supply Systems(B)	1
2014	都市上水道維持管理（給・配水）（A）	Operation and Maintenance of Urban Water Supply System (Water Distribution and	1
2014	アフリカ地域都市上水道技術者養成	African Region Urban Waterworks Engineering	2
2015	上水道無収水量管理対策 （漏水防止対策）	Non-Revenue Water Management (Leakage Control)	2
2015	都市上水道維持管理 （給・配水）	Operation and Maintenance of Urban Water Supply System (Water Distribution and	1
2015	アフリカ地域都市上水道技術者養成	African Region Urban Waterworks Engineering	1
2016	上水道施設技術総合	Comprehensive Engineering on Water Supply Systems	2
2016	水道管理行政及び水道事業経営	Water Supply Administration for Better Management of Water Supply Services	1

Training Schedule

Title of Training	Water Supply Management	Trainees: 3 persons		
Status of Training	Third Country Training	Mr. Ali Khalil Hassan Mirza	Principal Secretary	MLHWE
Training Period	from 29-Jan. 2015 to 7-Feb. 2015	Mr. Mussa Ramadhan Haji	Director (Commercial)	ZAWA
Training Coordinator	Mr. Nobukatsu Sakiyama: +962-79-554-4196	Mr. Hisham Mabrouk Khamis	Assistant Data Entry Officer	ZAWA

The aim of training in Jordan (WAJ and Miyahuna).

ZAWA tackles to improve financial conditions in the face of difficult problems on NRW reduction and tariff collection. Steady activities along the right way and decision of investment are required for having solutions. Therefore, it seems very effective to see how water utility manages these issues in Jordan.

Output-1	ZAWA understands that initial investments for system improvement are important to improve financial condition.
Output-2	ZAWA understands that customer management with view point of water demand driven is key issue for increasing of tariff income.
Output-3:	ZAWA understands that GIS improvement is key measure as a first step for decreasing of expenditure.

Date Jan-Feb '15		Time	Form	Activities	Trainer or Person in Charge			Place	Note
					Name	Status	Contact		
29	Thu	17:30 - 18:00	Transfer	PW-431 U: ZNZ-DAR*3				DAR	New Africa Hotel
30	Fri	09:30 - 09:50		Coastal SC: ZNZ-DAR				DOH	ORYX Rotana
		12:25 - 18:00		QR-1350 D: DAR-DOH*1					
31	Sat	12:35 - 14:40		QR-400 A: DOH-ANM				ANM	Kempinski Hotel
1	Sun	09:00 - 10:00	Courtesy	visit WAJ SG	Eng. Tawfig Habashneh	WAJ/SG		WAJ	
		10:00 - 11:00	Workshop	PPP Management	Eng. Iyad Dahiyat	PMU Director		PMU/WAJ	
		13:00 - 15:00	Workshop	NRW Management*2	Eng. Waleed Sukkar	Advisor		PMU/WAJ	
2	Mon	09:00 - 14:00	Visit	Marka Training Center	Eng. Tahani Jabasini	Dir. of Training		WAJ	
3	Tue	09:00 - 09:30	Courtesy	Miyahuna	Eng. Munier Owies	Miyahuna CEO		Miyahuna	
		09:30 - 11:30	Workshop	Water Operation	Eng. Ghazi Khalil	Dir. of Operation		Miyahuna	
		13:00 - 15:00	Workshop	Losses Monitoring	Eng. Abdullah Jarah	Head of Water Losses		Miyahuna	
4	Wed	09:00 - 11:00	Workshop	GIS	Eng. Mohammad Qudah	Head of GIS		Miyahuna	
		13:00 - 15:00	Workshop	SCADA	Eng. Mohammad Sarayrah	Head of SCADA		Miyahuna	
5	Thu	09:00 - 12:00	Visit	Zai WTP	Eng. Haithem Kilani	Dir. of Quality		Miyahuna	
		14:00 - 15:00	Visit	PMU office	Eng. Waleed Sukkar	Advisor		PMU/WAJ	
		16:30 - 17:00	Courtesy	JICA Jorda Office*2	Mr. Masaki Itagaki	Representative	079-514-8219	JICA	
6	Fri	16:00 - 19:30	Transfer	QR-401 A: ANM-DOH					
7	Sat	01:50 - 07:25		QR-1349 D: DOH-DAR*3					New Africa Hotel
		09:15 - 09:35		Coastal SC: DAR-ZNZ					
		15:45 - 16:15		PW-713: DAR-ZNZ					

Note*[1]: Stay at Hotel in DOH. Note*[2]: Presentation of ZAWA is included. Note*[3]: Stay at Hotel in DAR.

Hotel at DOH	Oryx Rotana		
Hotel at ANM	Kempinski Hotel	Abdul Hamid Shouman Street, Shmeisani, Amman 11194, Jordan	+962-6-520-0200
Hotel at DAR	New Africa Hotel	Dar es Salaam 9314	+255-22-211-7050

4.3 Minutes

(1) Progress Meeting

MINUTES OF MEETINGS

BETWEEN

JAPAN INTERNATIONAL COOPERATION AGENCY

AND

MINISTRY OF LANDS, HOUSING, WATER AND ENERGY

OF THE REVOLUTIONARY GOVERNMENT OF ZANZIBAR

OF THE UNITED REPUBLIC OF TANZANIA

ON

THE TECHNICAL COOPERATION PROJECT FOR

ENHANCEMENT OF WATER SUPPLY MANAGEMENT OF

ZANZIBAR WATER AUTHORITY PHASE 2

In line with the Record of Discussions on the Technical Cooperation Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred as "the Project") signed between the Ministry of Lands, Housing, Water and Energy (MLHWE) and Japan International Cooperation Agency (hereinafter referred to as "JICA"), JICA experts were dispatched to Zanzibar in November 2011. After the series of discussions between JICA experts, consulting mission arranged by JICA and related Tanzanian authorities both sides agreed on the matters referred to in the document attached hereto.

Zanzibar. 2nd December, 2011

Mr. Nobuyuki Gonohe
Chief Advisor
Project for Enhancement of Water Supply Management of ZAWA Phase 2

Dr. Mustafa Ali Garu
Director General
Zanzibar Water Authority,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

MINUTES OF MEETING

FOR

THE JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

In accordance with the Record of Discussions which was signed on 25th July 2011, first Joint Coordinating Committee for "Project for Enhancement of Water Supply Management of Zanzibar Water Authority phase 2" was held **on 5th June 2012**. Matters discussed at the meeting are attached hereto.

Zanzibar, June 5, 2012

Mr. Gonohe Nobuyuki
Chief Advisor,
JICA Expert Team,
Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2

Mr. Mwalim A. Mwalim (Project Director)
Principal Secretary,
Ministry of Lands, Housing, Water and Energy,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

Dr. Mustafa Ali Garu (Project Manager)
Director General,
Zanzibar Water Authority,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

ANNEX 7 Minutes of Meeting of JCC

MINUTES OF MEETING

FOR

THE JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

With regard to the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority phase 2", the Japan International Cooperation Agency (hereinafter referred to as "JICA") has dispatched the Project Consultation Mission (hereinafter referred to as "the Mission") headed by Mr. Hideo MIYAMOTO to the United Republic of Tanzania from December 3 until December 12, 2012.

The Mission had a series of discussion with Ministry of Lands, Housing, Water and Energy, Zanzibar Water Authority (hereinafter referred to as "ZAWA") and JICA Expert Team. In the Joint Coordinating Committee held on December 10, 2012, all parties confirmed the matters referred to in the document attached hereto.

Zanzibar, December 10, 2012

Mr. Hideo Miyamoto
Leader,
Project Consultation Mission,
JICA

Mr. Ali Khalil Mirza (Project Director)
Principal Secretary,
Ministry of Lands, Housing, Water and Energy,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

Mr. Nobuyuki Gonohe
Chief Advisor,
JICA Expert Team,
Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2

Dr. Mustafa Ali Garu (Project Manager)
Director General,
Zanzibar Water Authority,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

MINUTES OF MEETING

FOR

THE 3RD JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

With regard to the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")," the Japan International Cooperation Agency (hereinafter referred to as "JICA") has dispatched the Mid-term Review Team (hereinafter referred to as "the Mission Team") headed by MR. YOSHIKI OMURA to the United Republic of Tanzania from the 2nd day to the 22nd day of September 2013 for reviewing the mid-term progress of the Project.

The Mission Team had a series of discussion with Ministry of Lands, Housing, Water and Energy (hereinafter referred to as "MLHWE"); Zanzibar Water Authority (hereinafter referred to as "ZAWA"); and JICA Expert Team during the mission. The results of the mid-term review was presented together with the review members from ZAWA side and of the Mission Team in the 3rd Joint Coordinating Committee meeting held on the 18th day of September 2013 at Zanzibar. All parties confirmed the matters referred to in the document attached herewith.

Zanzibar, on the 20th day of September 2013

MR. YASUNORI ONISHI
Chief Representative,
JICA Tanzania Office

MR ALI KHALIL MIRZA
Project Director,
Principal Secretary,
Ministry of Lands, Housing, Water and Energy,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

MR NOBUKATSU SAKIYAMA
Chief Advisor
JICA Expert Team

DR. MUSTAFA ALI GARU
Project Manager,
Director General,
ZAWA,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

MINUTES OF MEETING

FOR

THE JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

With regard to the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")," the Japan International Cooperation Agency (hereinafter referred to as "JICA") has dispatched Senior Representative of Tanzania Office, namely MR. HAJIME IWAMA to Zanzibar for reviewing the progress of the Project.

JICA had a series of discussion with Ministry of Lands, Housing, Water and Energy (hereinafter referred to as "MLHWE"), Zanzibar Water Authority (hereinafter referred to as "ZAWA") and JICA Expert Team in the Joint Coordinating Committee meeting held on the 5th day of March 2014 at Zanzibar, all parties confirmed the matters referred to in the document attached herewith.

Zanzibar, on the 5th day of March 2014

MR. HAJIME IWAMA
Senior Representative,
JICA Tanzania Office

MR. ALI KHALIL MIRZA
Project Director,
Principal Secretary,
MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MR. NOBUKATSU SAKIYAMA
Chief Advisor,
JICA Expert Team

MR. ALI TAMIM MOHAMED
Project Manager (acting)
Director,
Finance and Administration,
ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETING

FOR

THE JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

With regard to the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")," the Japan International Cooperation Agency (hereinafter referred to as "JICA") has dispatched Chief Representative of Tanzania Office, namely MR. YASUNORI ONISHI to Zanzibar for confirming the progress of the Project.

JICA had a series of discussion with Ministry of Lands, Housing, Water and Energy (hereinafter referred to as "MLHWE"), Zanzibar Water Authority (hereinafter referred to as "ZAWA") and JICA Expert Team in the Joint Coordinating Committee meeting held on the 21st day of October 2014 at Zanzibar, all parties confirmed the matters referred to in the document attached herewith.

Zanzibar, on the 21st day of October 2014

MR. YASUNORI ONISHI
Chief Representative,
JICA Tanzania Office

MR. ALI KHALIL MIRZA
Project Director,
Principal Secretary,
MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MR. NOBUKATSU SAKIYAMA
Chief Advisor,
JICA Expert Team

DR. MUSTAFA ALI GARU
Project Manager,
Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETING

FOR

THE JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

The 7th Joint Coordinating Committee meeting of the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")" was held on the 27th day of February 2015 at Zanzibar. All parties confirmed the matters referred to in the document attached herewith.

Zanzibar, on the 27th day of February 2015

MR. YASUNORI ONISHI
Chief Representative,
JICA Tanzania Office

MR. ALI KHALIL MIRZA
Project Director,
Principal Secretary,
MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MR. NOBUKATSU SAKIYAMA
Chief Advisor,
JICA Expert Team

MR. MOHAMMED ILYASA
On behalf of Project Manager,
Acting Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETING

FOR

THE JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

The 9th Joint Coordinating Committee meeting of the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")" was held on the 20th day of August 2015 at Zanzibar. All parties confirmed the matters referred to in the document attached herewith.

Zanzibar, on the 20th day of August 2015

MR. KUNIAKI AMATSU
Senior Representative,
JICA Tanzania Office

MR. ALI KHALIL MIRZA
Project Director,
Principal Secretary,
MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MR. NOBUKATSU SAKIYAMA
Chief Advisor,
JICA Expert Team

DR. MUSTAFA ALI GARU
Project Manager,
Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETING
FOR
THE JOINT COORDINATING COMMITTEE MEETING
FOR
PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT
OF
ZANZIBAR WATER AUTHORITY PHASE 2

The 10th Joint Coordinating Committee meeting of the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")" was held on the 30th day of March 2016 at Zanzibar. All parties confirmed the matters referred to in the document attached herewith.

Zanzibar, on the 30th day of March 2016

MR. KUNIAKI AMATSU
Senior Representative,
JICA Tanzania Office

MR. ALI KHALIL MIRZA
Project Director,
Principal Secretary,
MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MR. NOBUKATSU SAKIYAMA
Chief Advisor,
JICA Expert Team

DR. MUSTAFA ALI GARU
Project Manager,
Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETING
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
MINISTRY OF LANDS, WATER, ENERGY AND ENVIRONMENT OF
THE REVOLUTIONARY GOVERNMENT OF ZANZIBAR OF
THE UNITED REPUBLIC OF TANZANIA
ON
THE JAPANESE TECHNICAL COOPERATION PROJECT FOR
ENHANCEMENT OF WATER SUPPLY MANAGEMENT OF
ZANZIBAR WATER AUTHORITY PHASE 2

Zanzibar, August, 16, 2016

Mr. Toshio Nagase Chief Representative, Japan International Cooperation Agency Tanzania Office	Mr. Ali Khalil Mirza Project Director Principal Secretary, Ministry of Lands, Water, Energy and Environment, The Revolutionary Government of Zanzibar The United Republic of Tanzania
Mr. Nobukatsu Sakiyama Chief Advisor, JICA Expert Team	Dr. Mohammed Ilyasa Mohammed Project Manager Acting Director General Zanzibar Water Authority The Revolutionary Government of Zanzibar The United Republic of Tanzania

(2) Consultation Meeting

MINUTES OF MEETING
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
MINISTRY OF LANDS, HOUSING, WATER AND ENERGY OF THE REVOLUTIONARY GOVERNMENT OF ZANZIBAR OF THE UNITED REPUBLIC OF TANZANIA
ON
THE JAPANESE TECHNICAL COOPERATION PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT OF ZANZIBAR WATER AUTHORITY PHASE 2

The Mid-term Review Team, organized by the Japan International Cooperation Agency, was dispatched from September 2 to 22, 2013 to review the progress of the Japanese Technical Cooperation Project for "Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2."

The Mid-term Review Team visited the Ministry of Lands, Housing, Water and Energy and the Zanzibar Water Authority to exchange views and opinions on the project with project stakeholders and had a series of discussion with the Tanzanian authorities concerned.

As a result of the discussions, both parties agreed on the matters referred to in the attached document hereto.

Zanzibar, September 18, 2013

Mr. Yoshiki Omura
Leader
Mid-Term Review Team
Japan International Cooperation Agency

Mr. Ali Khalil Mirza (Project Director)
Principal Secretary,
Ministry of Lands, Housing, Water and Energy,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

Dr. Mustafa Ali Garu (Project Manager)
Director General,
Zanzibar Water Authority,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

MINUTES OF MEETING
FOR
THE JOINT COORDINATING COMMITTEE MEETING
FOR
PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT
OF
ZANZIBAR WATER AUTHORITY (PHASE 2)

With regard to the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")," the Japan International Cooperation Agency (hereinafter referred to as "JICA") has dispatched Senior Advisor of Headquarters, namely MR. YOSHIKI OMURA to Zanzibar for consultation of the Project.

JICA had a series of discussion with the Ministry of Lands, Housing, Water and Energy (hereinafter referred to as "MLHWE"), the Ministry of Finance (hereinafter referred to as "MoF"), Zanzibar Water Authority (hereinafter referred to as "ZAWA") and the JICA Expert Team in the Joint Coordinating Committee meeting held on the 22nd day of August 2014 in Zanzibar, all parties confirmed the matters referred to in the document attached herewith.

Zanzibar, on the 22nd day of August 2014

MR. YOSHIKI OMURA
Head of the JICA Mission,
JICA Headquarters

MR. ALI KHALIL MIRZA
Project Director,
Principal Secretary, MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MR. NOBUKATSU SAKIYAMA
Chief Advisor,
JICA Expert Team

DR. MUSTAFA ALI GARU
Project Manager,
Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETINGS
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
AUTHORITIES CONCERNED ON THE GOVERNMENT OF
THE UNITED REPUBLIC OF TANZANIA
FOR AMENDMENT OF THE RECORD OF DISCUSSIONS
ON
PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT
OF ZANZIBAR WATER AUTHORITIES PHASE 2

The Japan International Cooperation Agency (hereinafter referred to as "JICA"), Ministry of Lands, Housing, Water and Energy (hereinafter referred to as "MLHWE") and Zanzibar Water Authority (hereinafter referred to as "ZAWA") hereby agree that the Record of Discussions on Project for Enhancement of Water Supply Management of Zanzibar Water Authorities Phase 2 (hereinafter referred to as "the Project") signed on the 25th day of July 2011 shall be amended attached herewith:

1. Annex I: Master Plan (in the Annex-2: Record of Discussions)

Before	Amended Version
Annex I: Master Plan	Annex I: Project Design Matrix 3 (PDM_3) (referred to Annex-1: PDM_3)
Reason: It is necessary to modify Project Purpose to reflect latest condition of the Project.	

This amendment shall become effective as of the 10th day of November 2014.

Annex-1: Project Design Matrix 3 (PDM_3)
Annex-2: Record of Discussions (signed on the 25th day of July 2011)

Zanzibar, on the 10th day of November 2014

Mr. Akihiro Miyazaki
Director,
Water Resources Management Team 2,
JICA

Mr. Ali Khalil Mirza
Project Director,
Principal Secretary, MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

Mr. Nobukatsu Sakiyama
Chief Advisor,
JICA Expert Team

Dr. Mustafa Ali Garu
Project Manager,
Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETING
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
MINISTRY OF LANDS, HOUSING, WATER AND ENERGY OF THE REVOLUTIONARY GOVERNMENT OF ZANZIBAR OF THE UNITED REPUBLIC OF TANZANIA
ON
THE JAPANESE TECHNICAL COOPERATION PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT OF ZANZIBAR WATER AUTHORITY PHASE 2

Zanzibar, June 1, 2015

Mr. Akihiro Miyazaki
Leader
Terminal Evaluation Team
Japan International Cooperation Agency

Mr. Ali Khalil Mirza
Principal Secretary,
Ministry of Lands, Housing, Water and Energy,
The Revolutionary Government of Zanzibar
The United Republic of Tanzania

MINUTES OF MEETING

FOR

THE JOINT COORDINATING COMMITTEE MEETING

FOR

PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT

OF

ZANZIBAR WATER AUTHORITY PHASE 2

The 8th Joint Coordinating Committee meeting of the "Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2 (hereinafter referred to as "the Project")" was held on the 1st day of June 2015 at Zanzibar. All parties confirmed (referred to "Attachment-2") the proposed PDM_{3-3} referred to in the document attached herewith (referred to "Attachment-1").

Zanzibar, on the 1st day of June 2015

MR. TOSHIO NAGASE
Chief Representative,
JICA Tanzania Office

MR. ALI KHALIL MIRZA
Project Director,
Principal Secretary,
MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MR. NOBUKATSU SAKIYAMA
Chief Advisor,
JICA Expert Team of the Project

DR. MUSTAFA ALI GARU
Project Manager,
Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

MINUTES OF MEETINGS
BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
AUTHORITIES CONCERNED ON THE GOVERNMENT OF
THE UNITED REPUBLIC OF TANZANIA
FOR AMENDMENT OF THE RECORD OF DISCUSSIONS
ON PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT
OF ZANZIBAR WATER AUTHORITIES PHASE 2

The Japan International Cooperation Agency (hereinafter referred to as "JICA") and Ministry of Lands, Housing Water and Energy (hereinafter referred to as "MLHWE) and Zanzibar Water Authority (hereinafter referred to as "ZAWA") hereby agree that the Record of Discussions on Project for Enhancement of Water Supply Management of Zanzibar Water Authorities Phase 2 (hereinafter referred to as "the Project") signed on the 25th day of July, 2011 shall be amended as herewith:

1. Attachment of Record of Discussions

IX. Terms of Cooperation	
Before	Amended Version
The duration of the technical cooperation for the Project under this Attached Document will be four (4) years from the date of the first Japanese expert's arrival in the United Republic of Tanzania.	The duration of the technical cooperation for the Project under this Attached Document will be five (5) years from the date of the first Japanese expert's arrival in the United Republic of Tanzania. According to this, the period of execution of work is set as October 31st, 2016.

This amendment shall be effective as of the 20th day of August, 2015.

Annex: Record of Discussions (signed on the 25th day of July, 2011)

Zanzibar, 20 August, 2015

MR. TOSHIO NAGASE

Chief Representative,
JICA Tanzania Office,

MR. ALI KHALIL MIRZA

Project Director,
Principal Secretary, MLHWE,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

DR. MUSTAFA ALI GARU

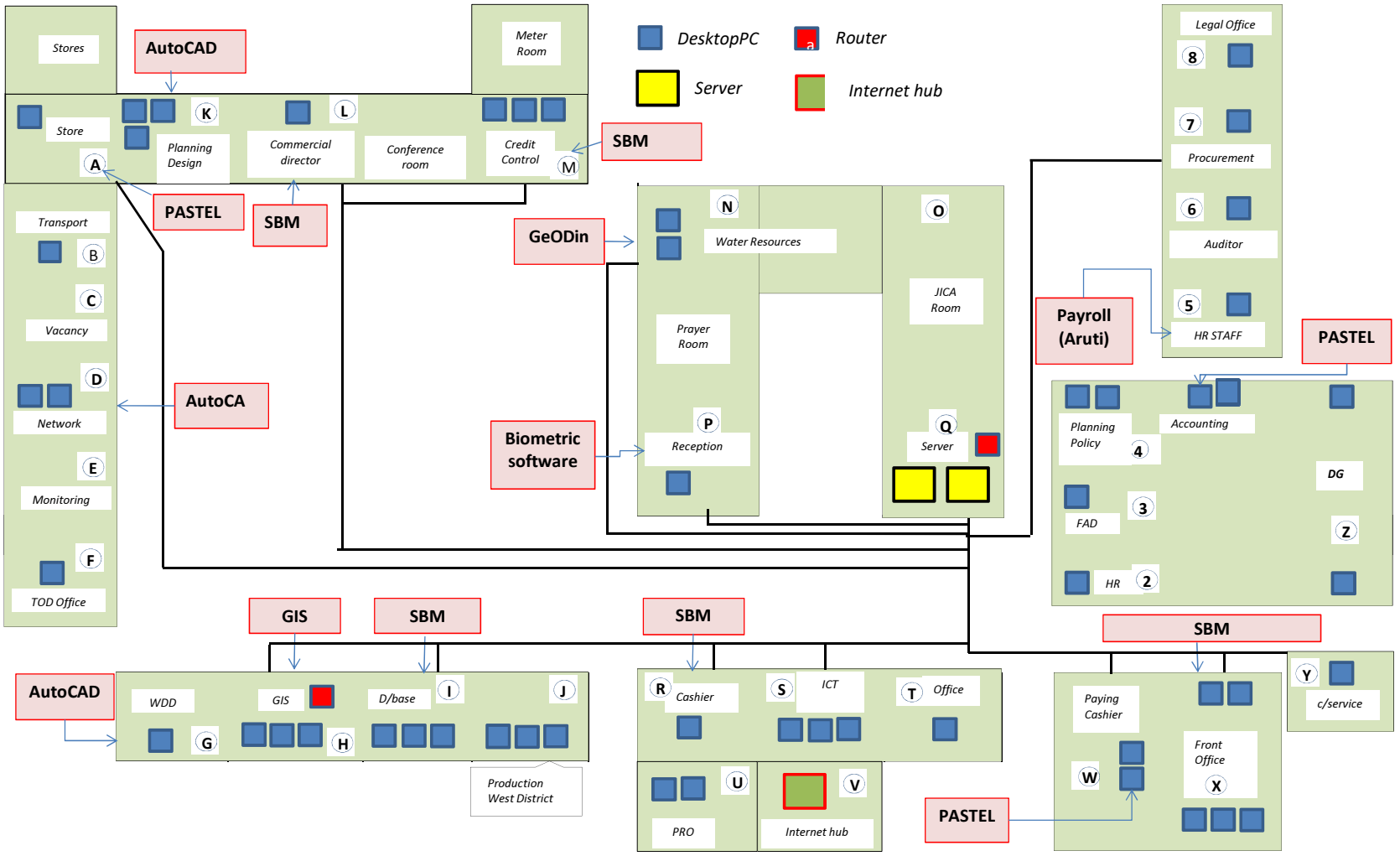
Project Manager,
Director General, ZAWA,
The Revolutionary Government of Zanzibar,
The United Republic of Tanzania

4.4 Outputs of Technical Cooperation

(1) Output-1: Preliminary Plan on ICT Improvement and Expansion

1. Current ICT Situation in Zanzibar Water Authority HQ

The Current status of ZAWA ICT system has been centered in the Headquarters Office; the table shows the various offices in ZAWA HQs.



2. Software Status in ZAWA

Software brief evaluation	Scoring out of 34								
	Understan -dability	User document -ation	Install -ability	Learn-ability	Licensing	Portability	Support -ability	Change -ability	Total
SBM	4	0	8	1	1	4	2	1	**21**
Pastel	4	7	8	1	1	4	3	0	**28**
Aruti (payroll)	4	7	8	1	1	4	3	0	**28**
GeODin	5	7	8	1	1	4	2	0	**28**
ArcGIS	4	7	8	1	1	3	4	1	**29**
AutoCAD	Not officially exists in ZAWA								

Software	General Status
SBM vr. 2 (for customer management) (latest version)	Developed and customized specifically for ZAWA`s customer data by the vender. Due to the lack of budget the software development has not yet been completed and still has rooms to improve with additional features that ZAWA can benefit. Yet, there is no budget planning for further development of the system. On the other hand, the system is too customized for ZAWA so unlike other software here the vendor is not managing the application and ZAWA is not taking advantages of any vender support for new product release, or new versions of SBM that can at least be promised to function for another 10-15 years. **If replacement is an option** it is advised to select a vendor that will take the utility into the future. This means that about every 5 to 7 years the vendor will offer a new CIS solution with a migration path for its clients so they can easily upgrade to the new CIS; In case of replacement a gradual migration is adviced -use the new system for metered customers and gradually migrate the flat, unmetered, or gost customers into the new system as the data is updated. Generally the staff is **not very satisfied** with SBM2. It is **client-server** system.
Pastel vr.7 (for accounting) (latest version)	Full name: Sage Evolution ERP Premium; It is **fully licensed**; Migrated from QuickBooks, ZAWA has been now using it for about 10 years according to the IT (but 5 years according to Accountant office) and being upgraded yearly; Bing used mostly for accounting, inventory; generally the staff **is satisfied** with the software; But it is **underused:** all modules like procurement and assests registration are available but not used. It is **client-server** system.
Aruti vr. 9.0 (for payroll) (latest version)	Full name: HR and Payroll Management software by NPK Technologies in Dar Salam established in 2003 in Africa and serves mostly the African market. ZAWA has been subscribed since 2008; It is first HR software in ZAWA; Most of the trainings in ZAWA have been on the job training; It is **fully licensed**; Generally the staff **is satisfied** with the software; It is **very much underused** and only the payroll modules has been utilized by the HR. With some formal trainings ZAWA could fully benefit from Aruti. It is **client-server** system.
GeODin vr. 8.0 (for water resource development) (latest version: 8.2)	**Funded by German for the AfDB project** of Integrated Water Resource Management (IWRM) which only was implemented for 2013-2014 but then stopped due to the budget re-allocation. During that year only ZAWA`s borehole data was digitized. Basically -as the main software for water resource management in ZAWA- this software is **fully licensed** with modules but extremely **underused** due to the lack of training, lack of data to be digitized and used. This software is not integrated with ArcGIS. It is **client-server** system.
ArcGIS 10.1 (At Commercial department) (latest 10.2 and ArcGIS Pro)	Two single DeskTop licenses were **funded by JICA in 2009**; one expired but one was extended by ZAWA which is currently being used as ArcGIS 10.1. A concurrent license (with installation permit on up to three computers) was funded by AfDB and installed on two computers at current GIS Mapping office; Only one GPS device is available for data collection; No ArcServer is available; No other extensions except Network Analyst is licensed; Not integrated with SBM; The satff is working on digitizing the Customer Service Survey database; It`s **underused**; It`s **not fully licensed;** No ArcGIS Server is purchased so data is shared manually. It is **client-server** system.
AutoCAD	**Not supported by the IT department**; the application has been used by a few staff as a personal software.

Software	Current Use	Expansion needs
SBM vr. 2	1. Meter reading 2. Bill delivery 3. Debt/Follow-ups 4. Meter installation 5. Tracking customer`s status when a complain arrives.	1. To be able to display meter delivery routing 2. Locational display of customers by specifications 3. Reporting functions such as monthly reports with charts and data 4. Production of User Guide/Help menu/Instruction materials 5. Removing dysfunction for the Customer Complaint's module 6. Adding functions for engineering to record water production and usage (was available in previous version) 7. Encoding data entry format to avoid errors 8. Integration with Aruti, Pastel, or other software
Pastel vr.7	1. ZAWA Store; Inventory of items at the ZAWA's store 2. Accounting; Records transactions 3. Records employee monthly transaction summary for revenue collection 4. Employee payments	1. No version upgrade is needed. 2. Prevent system network failure so the software can work. 3. Further training is needed 4. Make access to software available to the Auditor section 5. Integration with SBM and Aruti (payroll) is needed. 6. Recording of debts and assets registration and values could become of the modules for expanded use.
Aruti vr. 9.0	1. Payroll 2. Monthly transaction reports for revenue collection	1. Some functions of the software (like self-employee functions) could be on ZAWA server. 2. Has been used very limited only for payroll. 3. Employee leave/absence management, Performance management. 4. Online job advertising and applications, training needs analysis 5. Employees self service functions to reduce the load on HR (i.e. manage their profile, benefits, addresses, dependents, beneficiaries, apply for internally advertised jobs, apply for leave and monitor leave approval status, conduct Self Performance evaluation, receive information on training enrolments).
GeODin vr. 8.0	1. Digitized 200 boreholes 2. Prints out borehole data when requested 3. Borehole cross-section charts 4. Provides borehole data to GIS section for map display 5. Displays borehole vertical structure and prints out when requested by water production	1. Same version (8.2) will be sufficient for a while. 2. To digitize spring data which are currently on papers. 3. To monitor groundwater 4. To maintain boreholes and checking their salination levels 5. Groundwater monitoring 6. To digitize other water resource related data as produced. 7. Further training is needed for using other GeODin`s toolsets. 8. Integrate with ArcGIS if necessary
ArcGIS 10.1	1. Digitized some of the ZAWA`s water network; Imported the AutoCAD maps of JICA project to GIS; Digitized some other water network according to the paper maps by the AfDB or other donors 2. Mapped boreholes and reservoirs 3. Digitally records customers service survey into GIS; not integrated with SBM	1. Further training is needed 2. ArcGIS updates and ArcGIS server is needed. 3. ArcGIS extensions like Spatial Analysis are needed. 4. Subscription to ArcGIS Online is needed. 5. Borehole data must be checked with borehole database in GeODin. 6. GPS devices are needed. 7. Phased expansion/extension is needed for HQs and District Offices as well as training for staff, in terms of hardware and licensed software.
AutoCAD		It is needed for ZAWA

3. Criteria for Usability and Maintainability Assessment of ZAWA's Software (Software scoring according to some crietria)

Criteria	Items		Yes (1) / No(0)				
			SBM2	Pastel	Payroll	GeODin	ArcGIS
Use -ability	Understandability	1. It is straightforward to understand what the software does and its purpose.	1	1	1	1	1
		2. It is straightforward to understand the use of the software.	1	1	1	1	1
		3. It is straightforward to understand the software's basic functions.	1	1	1	1	1
		4. It is straightforward to understand the software's advanced functions.	1	0	0	1	0
		5. Software help is available.	0	1	1	1	1
	User Documentation	6. Consists of clear, step-by-step instructions.	0	1	1	1	1
		7. Provides a high-level overview of the software.	0	1	1	1	1
		8. Gives examples of what the user can see at each step e.g. screen shots or command-line excerpts.	0	1	1	1	1
		9. For problems and error messages, the symptoms and step-by-step solutions are provided	0	1	1	1	1
		10. States command names, says what menus to use, lists error messages exactly as they appear.	0	1	1	1	1
		11. What version of the software the documentation applies to.	0	1	1	1	1
		12. It is available to the users.	0	1	1	1	1
	Installability	13. It is straightforward to meet the pre-requisites for the software on a target platform.	1	1	1	1	1
		14. It is straightforward to install the software onto a target platform.	1	1	1	1	1
		15. It is straightforward to configure the software following installation for use.	1	1	1	1	1
		16. It is straightforward to verify the installation for use.	1	1	1	1	1
		17. All mandatory third-party dependencies are currently available.	1	1	1	1	1
		18. Tests are provided to verify the install has succeeded.	1	1	1	1	1
		19. When software is installed, its contents are organized into sub-directories.	1	1	1	1	1
		20. Uninstallers uninstall every file or warns user of any files that were not removed and where these are.	1	1	1	1	1
	Learnability	21. A getting started printed guide is provided by ZAWA outlining a basic example of using the software.	0	0	0	0	0
		22. Verbal instructions are provided by ZAWA for many basic use cases.	1	1	1	1	1
		23. Printed instructions are provided by ZAWA for many basic use cases.	0	0	0	0	0
	Sum		**13**	**20**	**20**	**21**	**20**
Maintain -ability	Licensing	25. Has an appropriate license	1	1	1	1	1
	Portability	26. Application can be built on and run under earlier Windows.	1	1	1	1	0
		27. Application can be built on and run under Windows 7.	1	1	1	1	1
		28. Application can be built on and run under Windows XP.	1	1	1	1	1
		29. Application can be built on and run under Windows Vista.	1	1	1	1	1
	Supportability	30. Software website has page describing how to get support.	0	1	1	1	1
		31. Software web site has search facility.	0	0	0	0	1
		32. Customer service is available locally.	1	1	1	0	1
		33. Customer service responds properly.	1	1	1	1	1
	Changeability	34. It is straightforward to modify the software to address issues, modify functionality, or add new functionality.	1	0	0	0	1
	Sum		**8**	**8**	**8**	**7**	**9**
Total Score			**21**	**28**	**28**	**28**	**29**

4. Software in ZAWA ; Staff skill levels and potential users

Software	Department	Section	User`s Name	User`s Position	Skill Level for Current Used Modules					Needs training on currently un-used but licensed modules
					High	Skilled	Light	Potential User	Needs training	
SBM2	Commercial Department	Credit Control	Rashid Juma Khamis	Head Officer	*					*
			Bilali khalid Abass (JICA)	Meterwork	*					*
			Bilbali Makarani Sarboko	Asst. Credit Control	*					*
			Hafidh Ali Mgeni (JICA)	Driver/MeterRead/Cashier	*					*
			Ali Said Khamis	Asst. Credit Control	*					*
			Vuai Jabir Yange	Asst. Credit Control	*					*
			Hisham Iddi Simbq	Asst. Credit Control	*					*
		Customer Care	All Staff	Head Officer, Assts., Front Desk	*					*
		Data Mgt.	All Staff	Head Officer, Assts.	*					*
	IT	IT	All Staff	Head Officer, Assts.	*					
	Finance & Administration	Accounting	All Staff	Head Officer, Assts.	*					*
		Planning & Policy	All Staff	Head Officer, Assts.	*					*
	Water Development	GIS Mapping	All Staff	Water Technician				*	*	*
		Planning & Design	Phili Masoudi	Water Technician				*	*	*
	Internal Audit	Internal Audit	All Staff					*	*	*
Pastel	Finance & Administration	Accounting	Zuleifa Kassim Saleh	Chief Accountant	*					*
			Silima Mussa Ali	Accounting Expenditure	*					*
			Seif Shaabani Seif	Project Accountant	*					*
			Haji Makame Sheiha	Chief Cashier		*				*
			Manakombo Vuai Ngeni	Revenue Accountant	*					*
			Ali Sheiha Khamis	Asst. Revenue Accountant			*		*	*
		Planning & Policy	Haidar Khamis	Store Officer	*					*
			Said Aboud	Asst. Store Officer				*	*	*
	Internal Audit		Jombi Kheri Karama	Auditor				*	*	*
	Procurement		Rajab Khamis	Procurement Assistant				*	*	*
Aruti	Finance & Administration	Human Resources	Hassan Juma Ali	Head Officer			*	*	*	*
			Mohammed Ramadan Mumbwa	Asst. Head Office				*	*	*
			Safia Ishak	HR Asst. Payrol;l	*					*
			Amiri Rajab	HR Asst. Payroll	*					*
			Omar Haji Omar	HR Asst.				*	*	*
			Haidar Ali Makame	HR Asst.				*	*	*
			Said Mwinyi Mwinshehe	HR Asst.				*	*	*
			Shaaban Vuai Ali	HR Asst.				*	*	*
	All Departments	All Sections	All Employees (Self-service)	All Positions						*
GeODin	Water Development	Water Resources Mgt.	Haji Shaaban Haji	Head Officer			*	*	*	*
			Hassan Zahran Haji	Water Resource Tec.			*	*	*	*
			Kazija Ame Thabit	Water Resource Tec.			*	*	*	*
ArcGIS	Commercial	Data Mgt,	Hisham Mabrouk Khamis	Asst. Data Entry	*				*	*
			Mussa Said Khamis	Asst. Data Entry	*				*	*
	Water Development	Planning & Design (Projects)	Kumbo Ali Khamis	Water Technician			*		*	*
			Mohammed Ali Khamis	Water Technician		*			*	*
	All Departments	All Sections	Selected Employees	Users of GIS data				*	*	*
AutoCAD	Water Development	Water Resources Mgt.	Haji Shaaban Haji	Head Officer				*	*	*
			Hassan Zahran Haji	Drilling Technician				*	*	*
			Kazija Ame Shabir	Asst. Drilling Engineer				*	*	*
		Planning & Design (Projects)	Bakari Juma Bakari	Head of Section				*	*	*
			Mohamed Ali Khamis	Water Technician (GIS)				*	*	*
			Kombo Ali Khamis	Water Technician (GIS)				*	*	*
			Pilli Masoudi	Water Technician				*	*	*
	Technical Operation	Water Network	Maulid Hassan Khamis	Director				*	*	*
			Rasid Mohamed Yussuf	Head of Section				*	*	*
			Mohamed Hamdu Haji	Asst. Head of Section				*	*	*
			Omar Zobairy	Asst. Water Network				*	*	*
			Noora Issa	Asst. Water Network				*	*	*

5. SBM2 Issues at ZAWA - Points discussed by the ZAWA Users

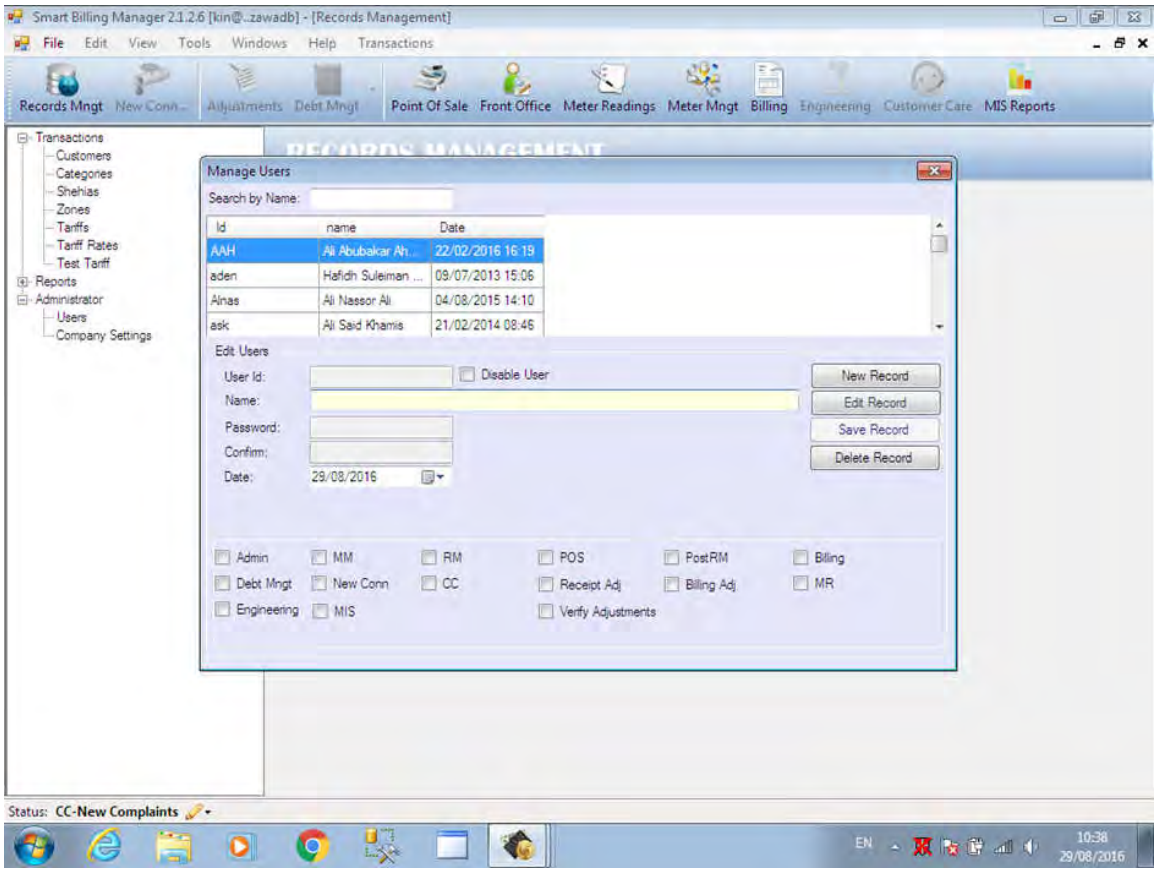
(1) SBM2 lacks major database security measures and could be hacked: "RECORD MANAGEMENT"

(reported by Mr. Rashid of Credit Control)

a. Though the SBM2 administrator can select different levels of authorization for ZAWA user accounts, SBM2 software dysfunctions and thus fails to apply the selected settings when set up for the access to Record Mngt. As result, surprisingly, these users are (have been) fully authorized without knowing!

b. An additional false secondary account with full authorization with only a token name and username can be easily generated by a user. The account can be then removed without any footprints for dishonest activities.

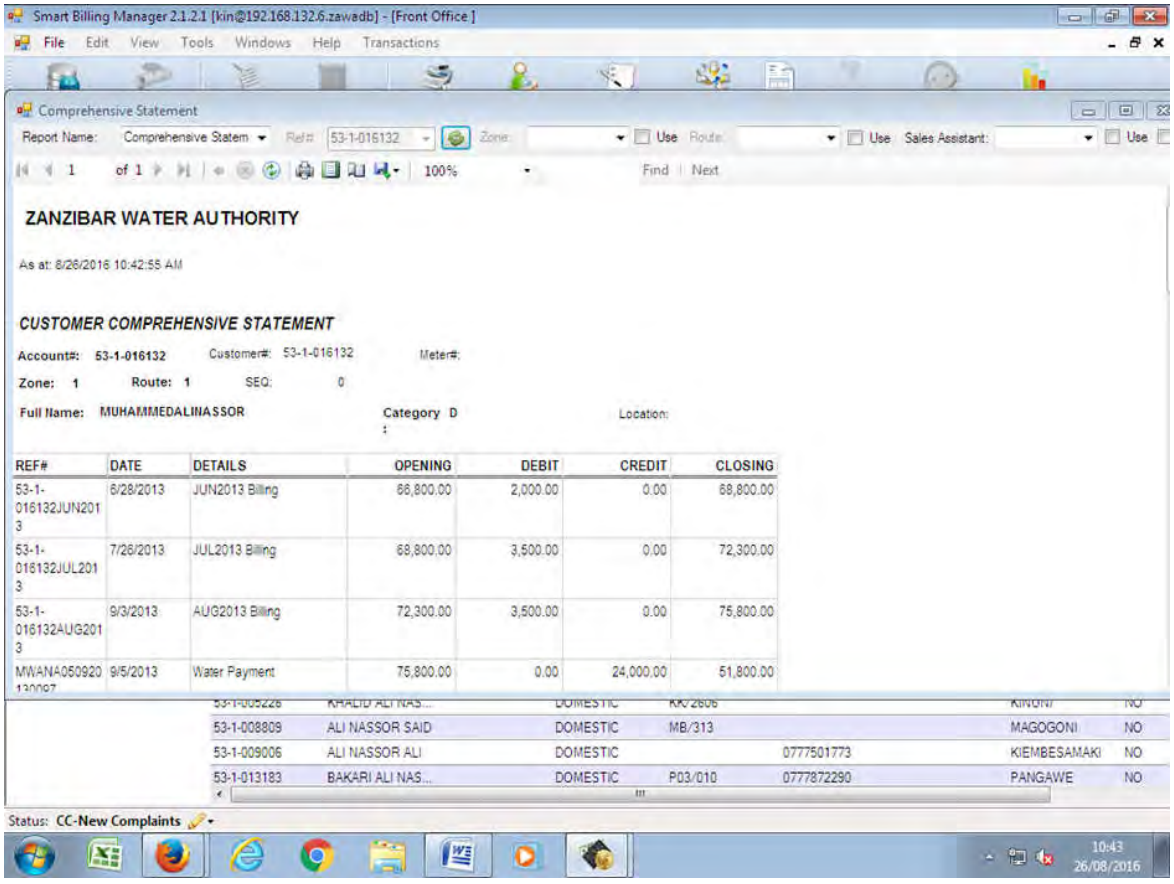
c. The software can be accessed outside of ZAWA. Such access could jeopardize the database security on unsafe internet network lines.

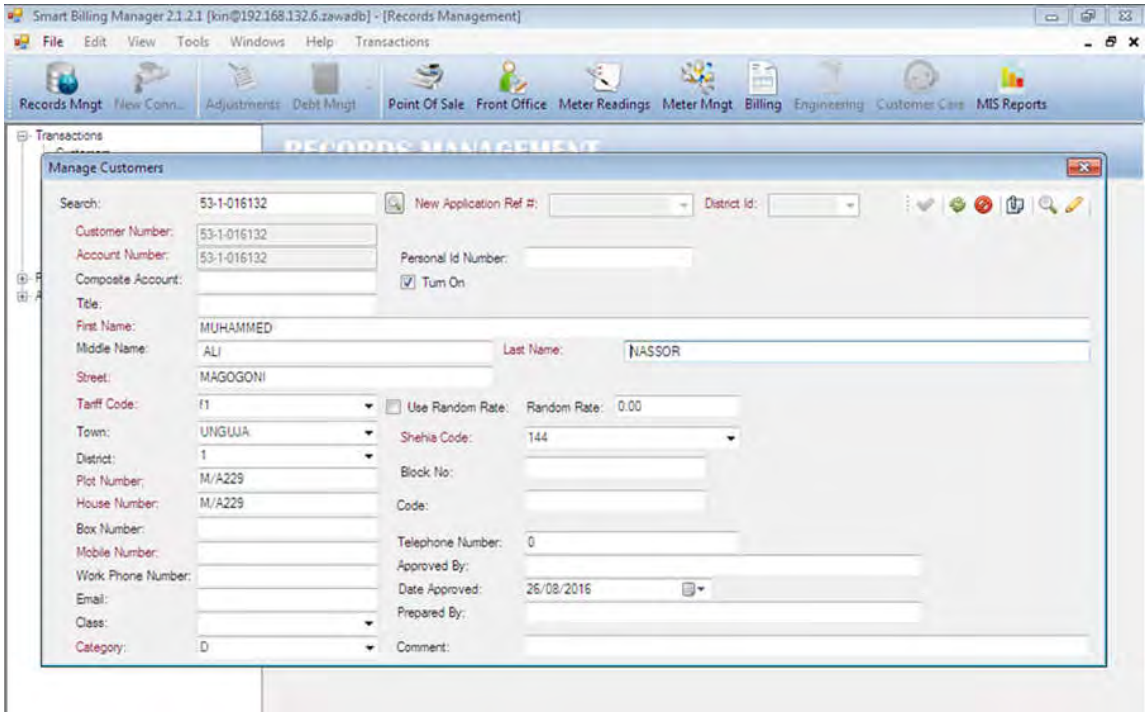


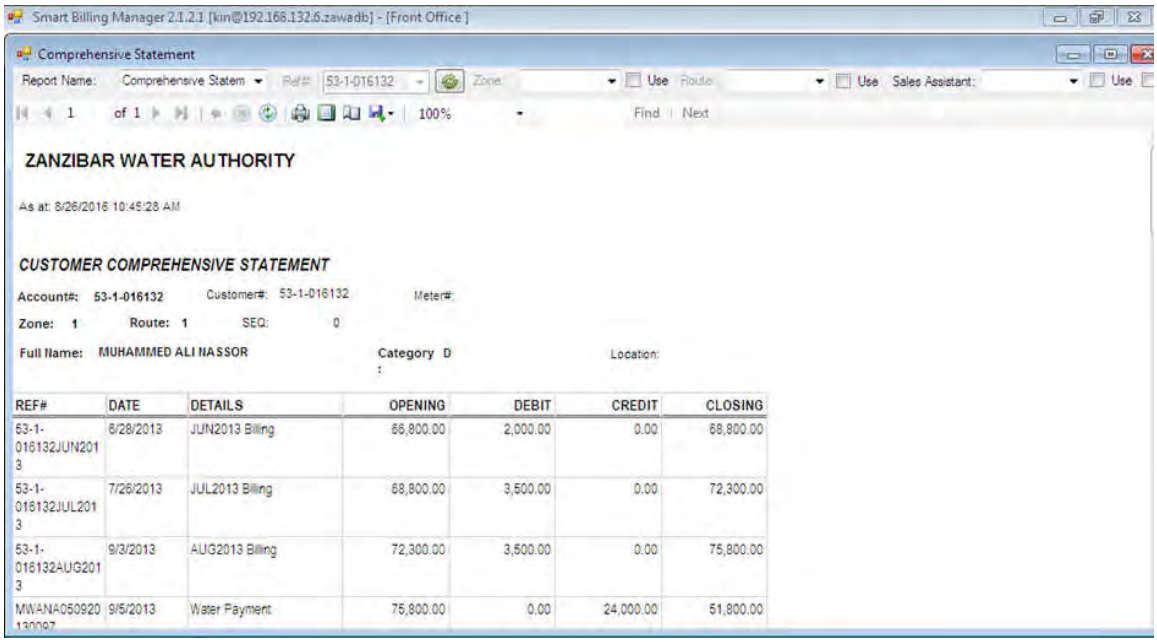
(2) Unnecessary clicks; Customer name

(reported by Mr. Kinange of Data Management)

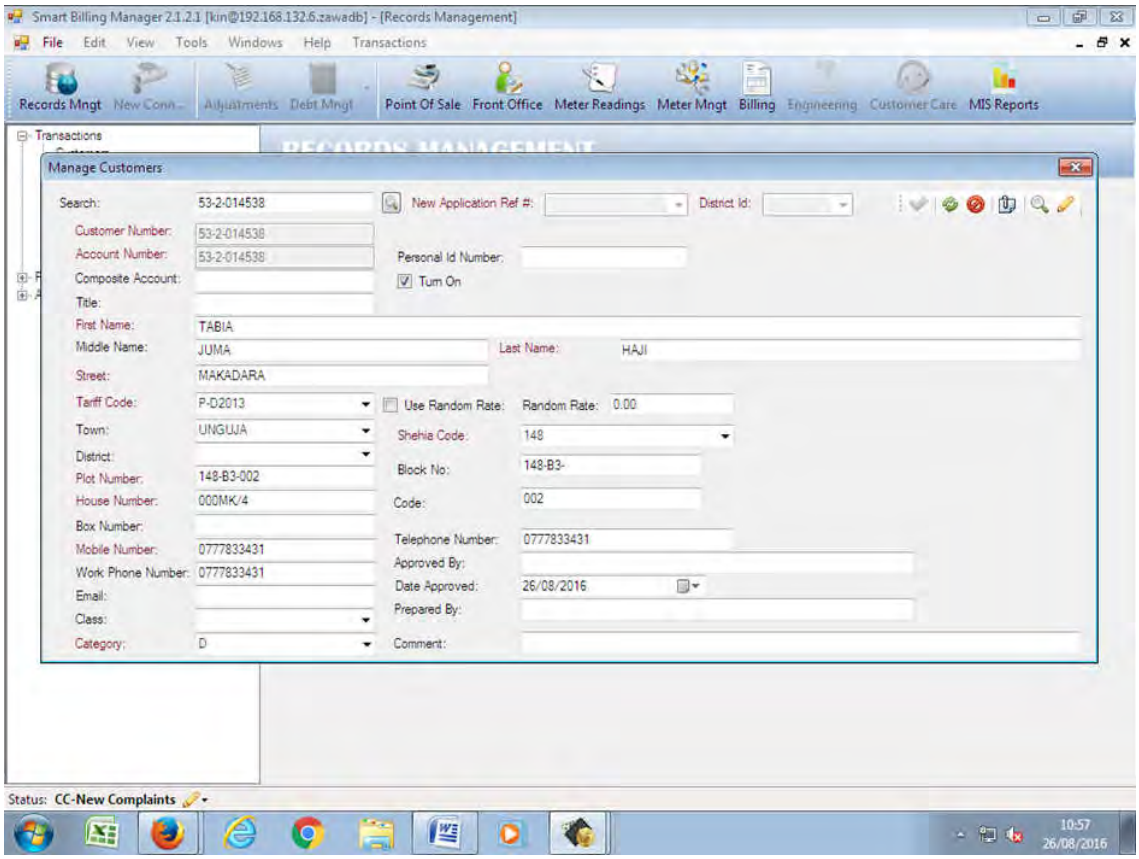
a. **Format/typing issues**: Customer name does not appear on the statement with space between first and last name though it is types in separate boxes at the customer file. The operator has to click the space button on computer keyboard before typing the family name in the related boxes.







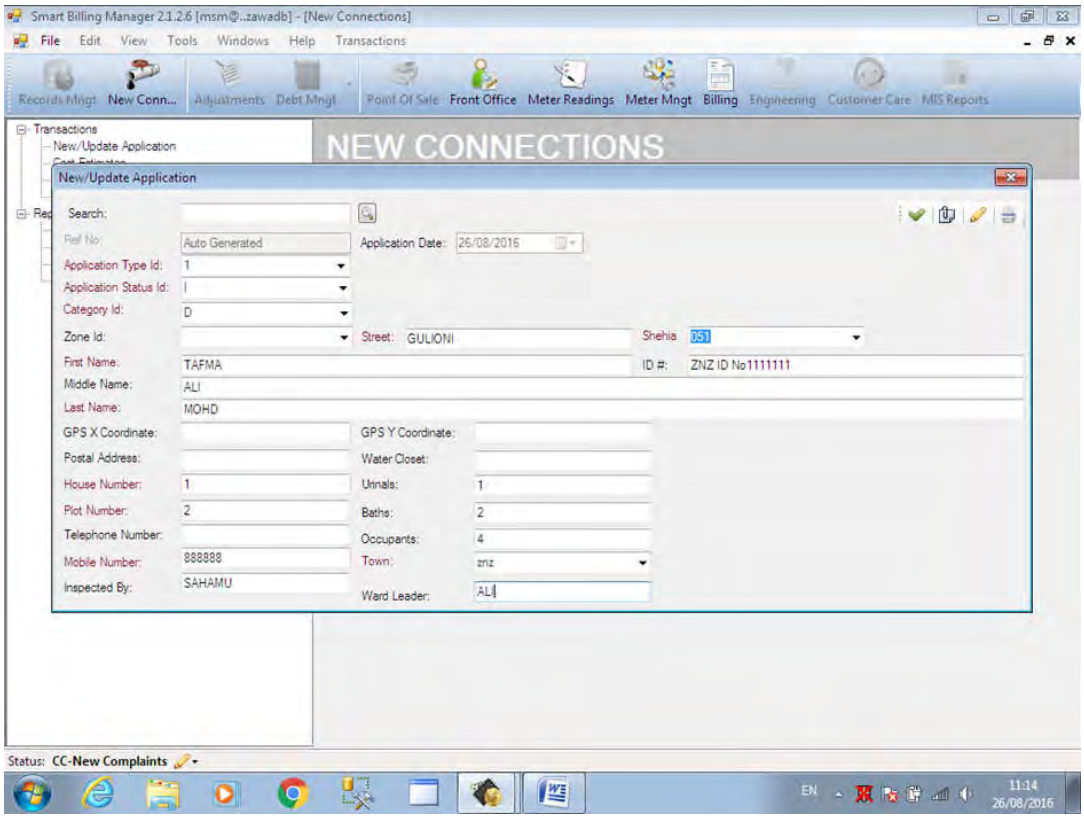
b. **Temporary turning off a customer account:** This is a case when the water is temporary unavailable to certain customers by ZAWA -for reasons like lack of water or long term constructions- thus some customer accounts need to be turned off to avoid being charged. The issues is that the `Turn Off` button on SBM2 does not applies the turning off function and customers could be still charged and receive bills. As an alternative in addition to the `Turn off` button, the operator, has to also select the `Use Random Rate` button and manually set up the balance to zero for the period of disconnection.

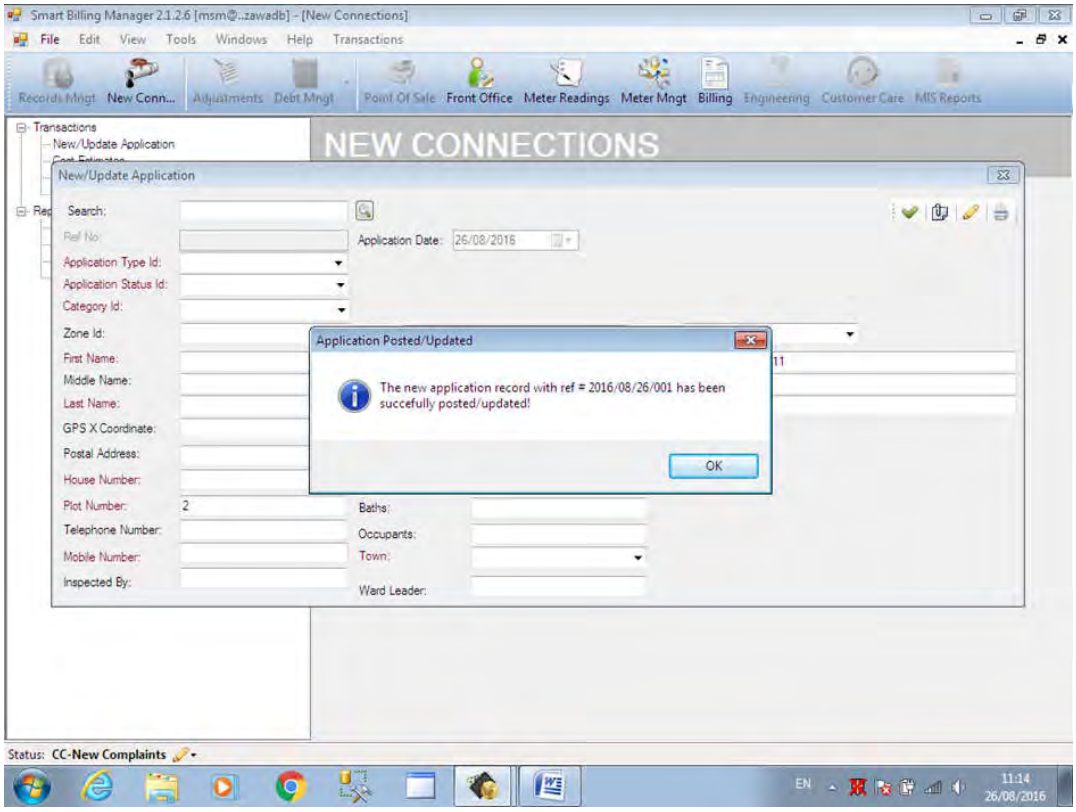


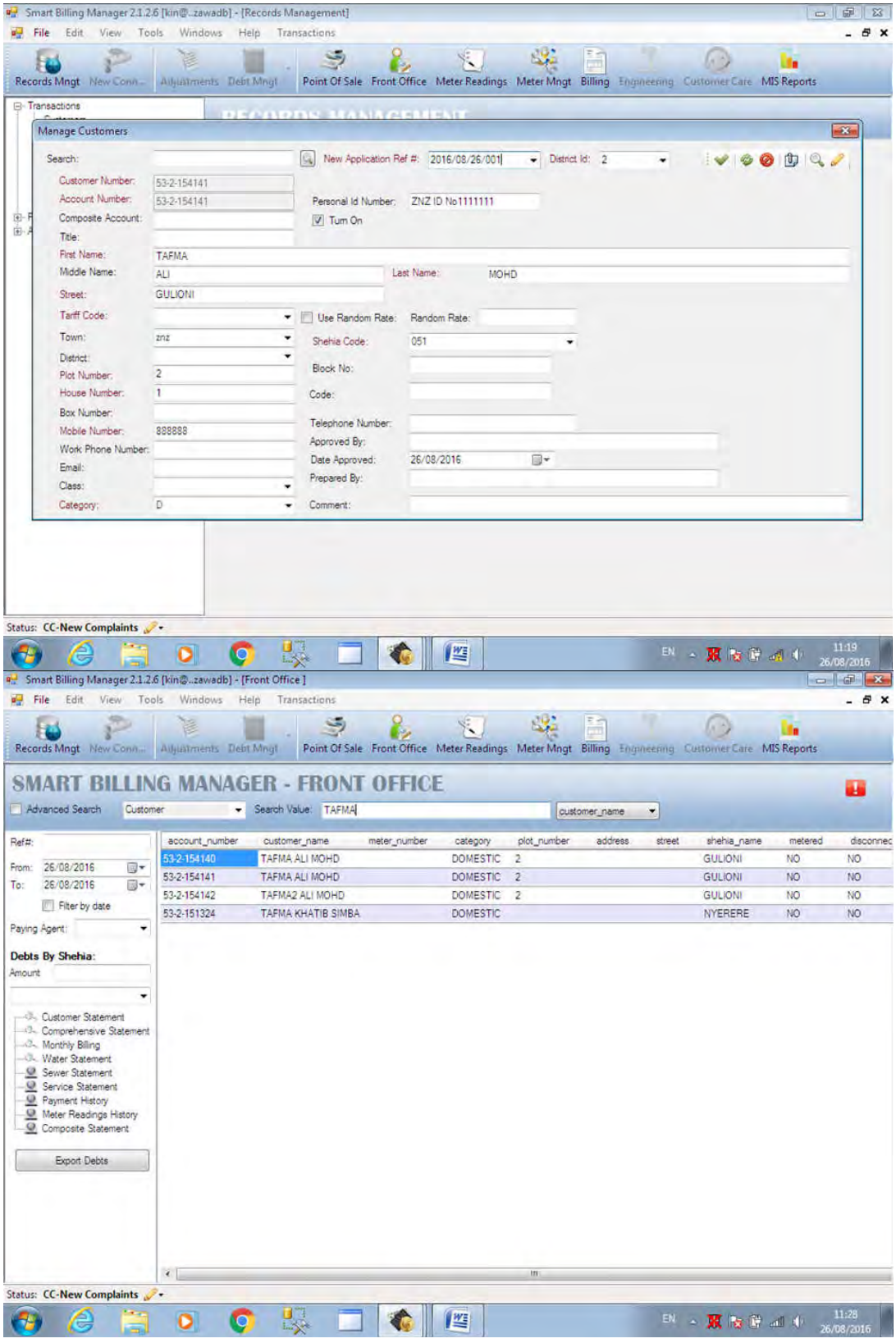
(3) SBM2 generates similar reference number for multiple customers: "BILLING"

(reported by Mr. Sahamu of Data Management)

a. Anytime a customer account file is opened and saved, a new account number for the same customer and the same reference number is generated in the database by SBM2. This means a new customer is added to the database which does not exist. Screenshots below show a sample new customer TAFMA ALI MOHD with a new assigned reference number and account number of 53-2-154140. After opening and saving the customer file SBM2 generated another account number for the same customer.

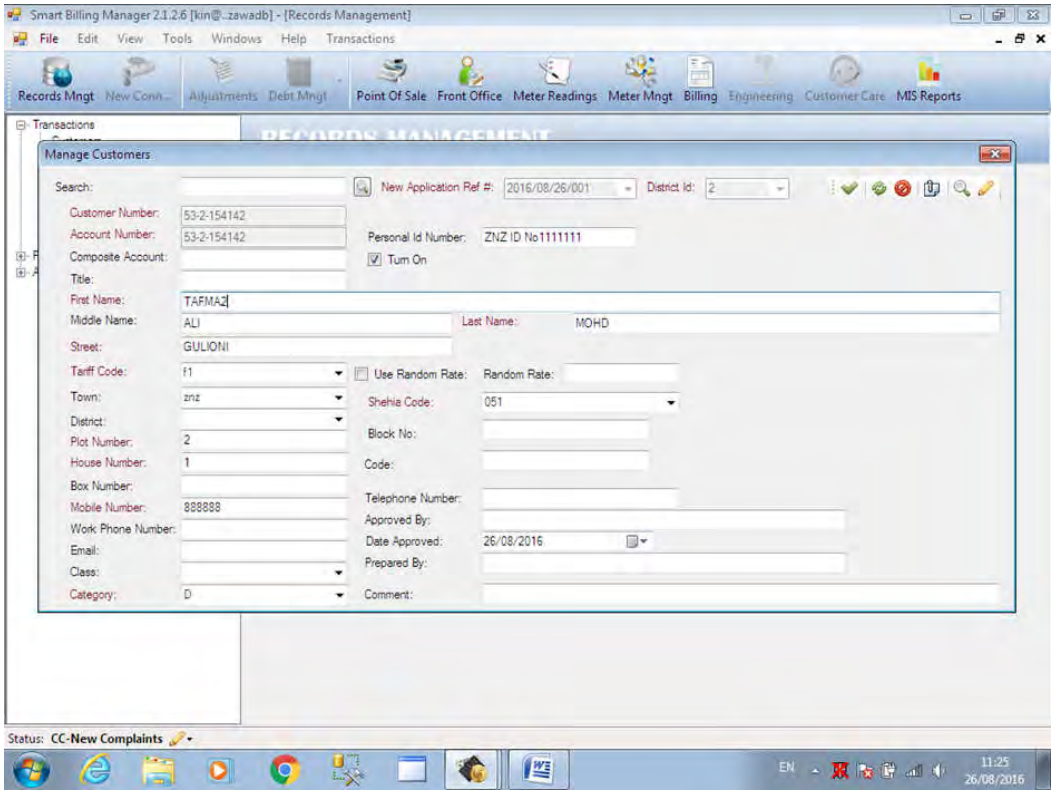

Smart Billing Manager 2.1.2.6 [msm@..zawadb] - [New Connections]
File Edit View Tools Windows Help Transactions
Records Mngt New Conn... Adjustments Debt Mngt Point Of Sale Front Office Meter Readings Meter Mngt Billing Engineering Customer Care MIS Reports
Transactions
New/Update Application
NEW CONNECTIONS
New/Update Application
Search:
Ref No: Auto Generated
Application Date: 26/08/2016
Application Type Id: 1
Application Status Id: I
Category Id: D
Zone Id:
Street: GULIONI
Shehia 351
First Name: TAFMA
ID #: ZNZ ID No1111111
Middle Name: ALI
Last Name: MOHD
GPS X Coordinate:
GPS Y Coordinate:
Postal Address:
Water Closet:
House Number: 1
Urinals: 1
Plot Number: 2
Baths: 2
Telephone Number:
Occupants: 4
Mobile Number: 888888
Town: znz
Inspected By: SAHAMU
Ward Leader: ALI
Status: CC-New Complaints
EN 11:14 26/08/2016

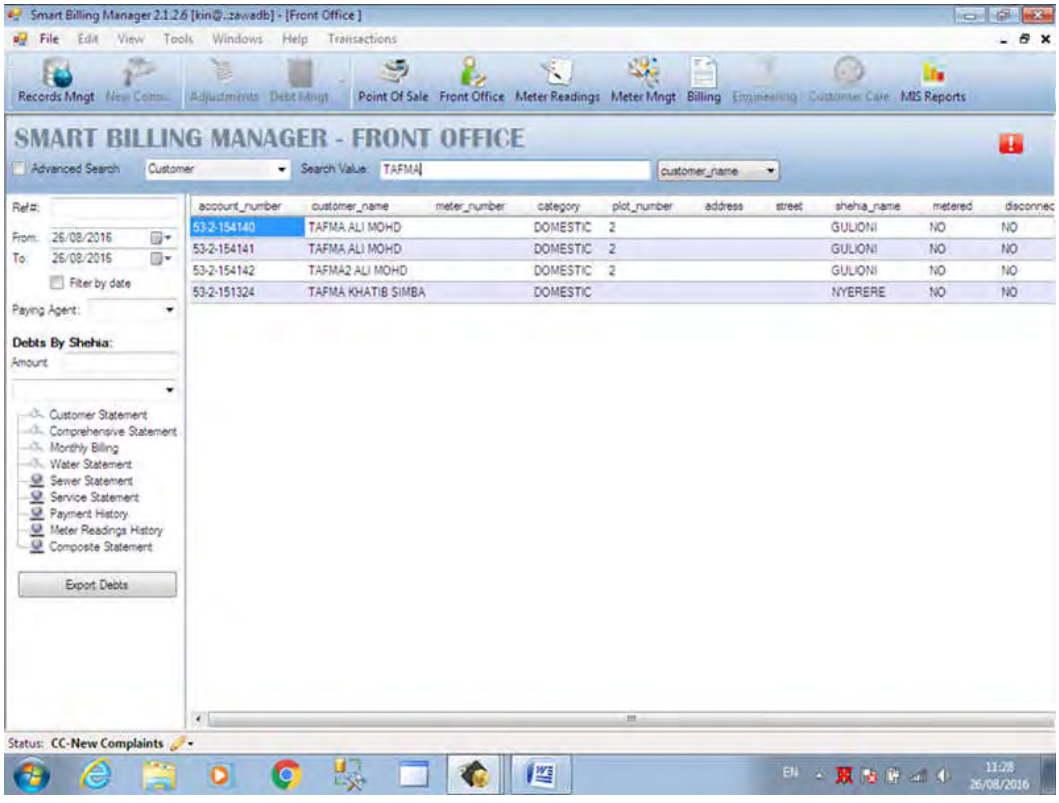

Smart Billing Manager 2.1.2.6 [msm@..zawadb] - [New Connections]
File Edit View Tools Windows Help Transactions
Records Mngt New Conn... Adjustments Debt Mngt Point Of Sale Front Office Meter Readings Meter Mngt Billing Engineering Customer Care MIS Reports
Transactions
New/Update Application
NEW CONNECTIONS
New/Update Application
Search:
Ref No:
Application Date: 26/08/2016
Application Type Id:
Application Status Id:
Category Id:
Zone Id:
Application Posted/Updated
The new application record with ref = 2016/08/26/001 has been succefully posted/updated!
OK
First Name:
Middle Name:
Last Name:
GPS X Coordinate:
Postal Address:
House Number:
Plot Number: 2
Baths:
Telephone Number:
Occupants:
Mobile Number:
Town:
Inspected By:
Ward Leader:
Status: CC-New Complaints
EN 11:14 26/08/2016



b. Any editing/upgrading in a customer data file -like name change/spelling updates- generates a completely new customer with the same reference number in SBM2. For example

after editing the customer name from TAFMA to TAFMA2, SBM2 generated a complete new customer with a different account number.

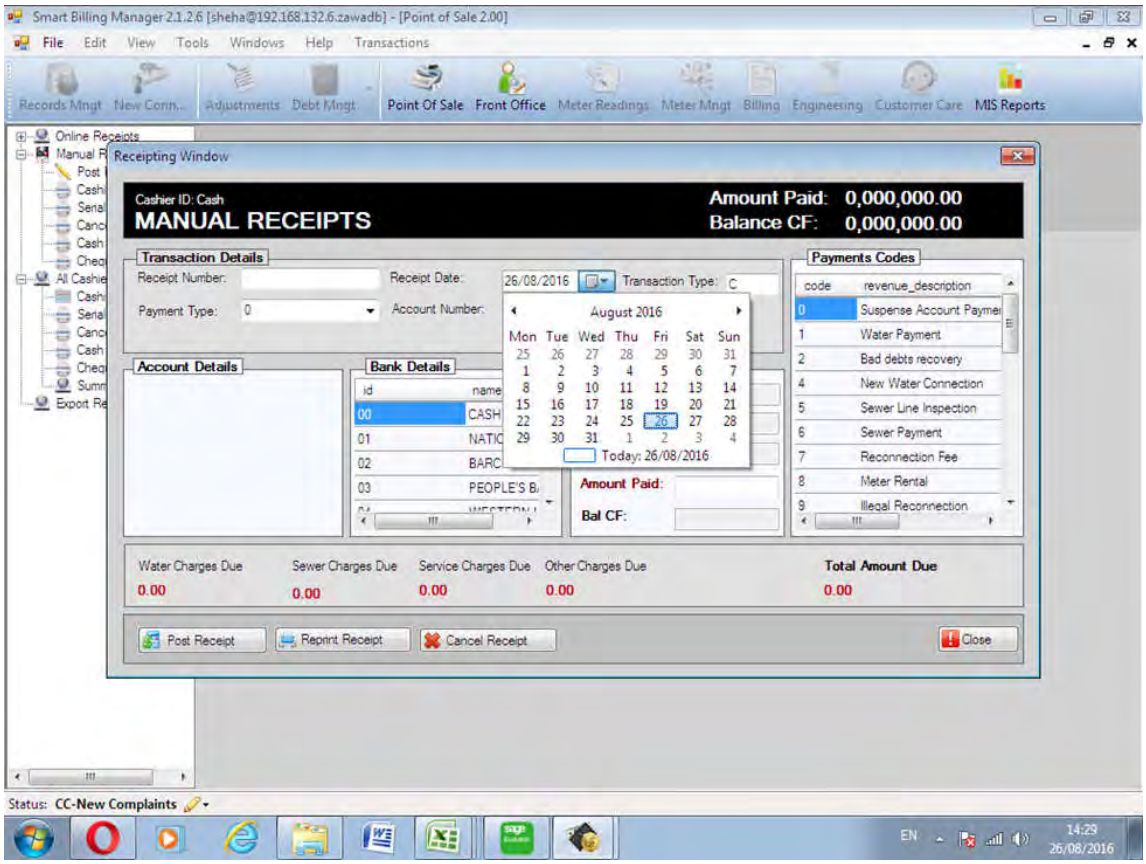




(4) Issues with recording the activity date on SBM2: "POINT OF SALE"

(reported by Mr. Ali Sheha of Accounting)

The module for cashiers, for example, enables user to enter a pervious date when entering data -even up to the previous year. This could be of concern especially when it relates to monetary/financial data. Though this fits with ZAWA's need where collected bills from districts could sometimes arrive with delays at the HQ, some restrictions of up to one or two days delays need to be placed. A box for notes/remarks for further explanation by the operator would be needed as well.



(5) Issues with online and manual receipts: "POINT OF SALE"

(reported by Mr. Ali Sheha of Accounting)

`Online Receipt` is used at the customer service window where customer receives a printed receipt with a receipt number. Once click save, this function can automatically allocate the total fee paid by the customer as installment to both water due fees and also service connection due fee, if any.

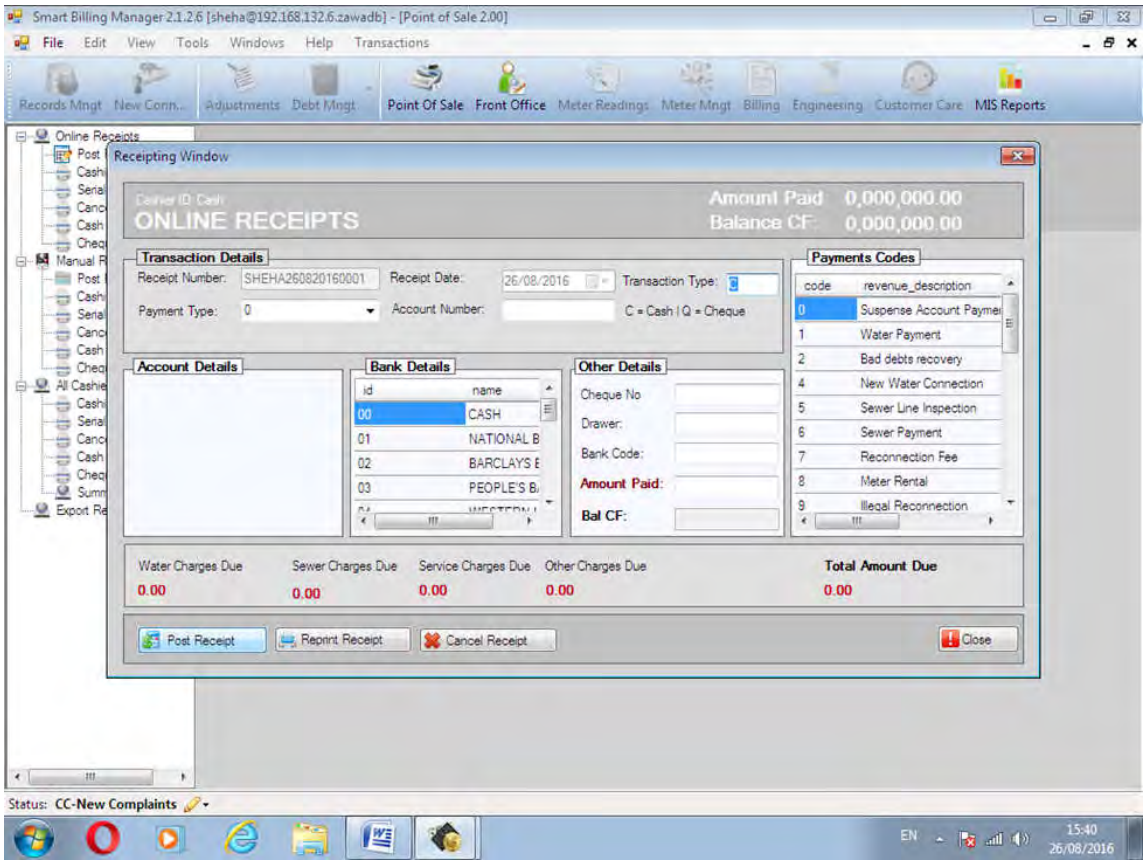
`Manual Receipts` is used for recording paper receipts. Paper receipts are issued when customers pay at the site instead at the customer service window. The manual receipt has a receipt number and customer account number. The receipt does not divide the total payment between water and connection fees as customer may not be aware of any due balance for their

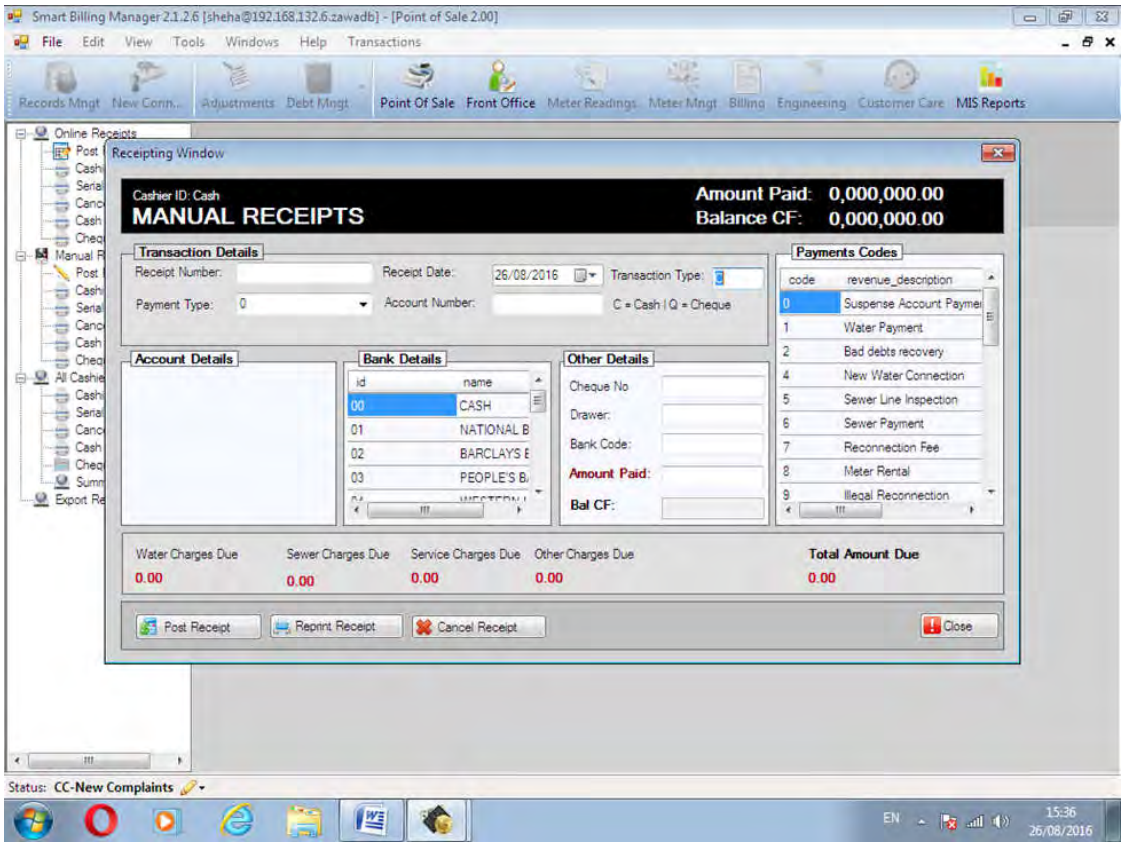
connection fee. The paid amount then is recorded on SBM2 by using the `Manual Receipt` dialog window and no need to print a receipt. The issue is that unlike `Online Receipt`, the `Manual Receipt` does not allocate the total payment between the two due fees *automatically*. Also, in the comprehensive statement of water fee payment, the debit due does not appear.

Suggestion:

1) Giving that the two dialog windows look completely the same but only different window names, remove the `Manual Receipt` function set all together. Instead, provide a box on `Online Receipt` window where operator can select Manual Payment and then a box where the manual receipt number can be typed. No need to print a receipt. In this case, to avoid any confusion, it is better to change the `Online Receipt` function set's name to just `Receipts`.

2) A less recommended suggestion would be to keep the `Manual Receipt` function set but fix the link so it can automatically divide the total paid amount to water charge due fee and service connection due fee.

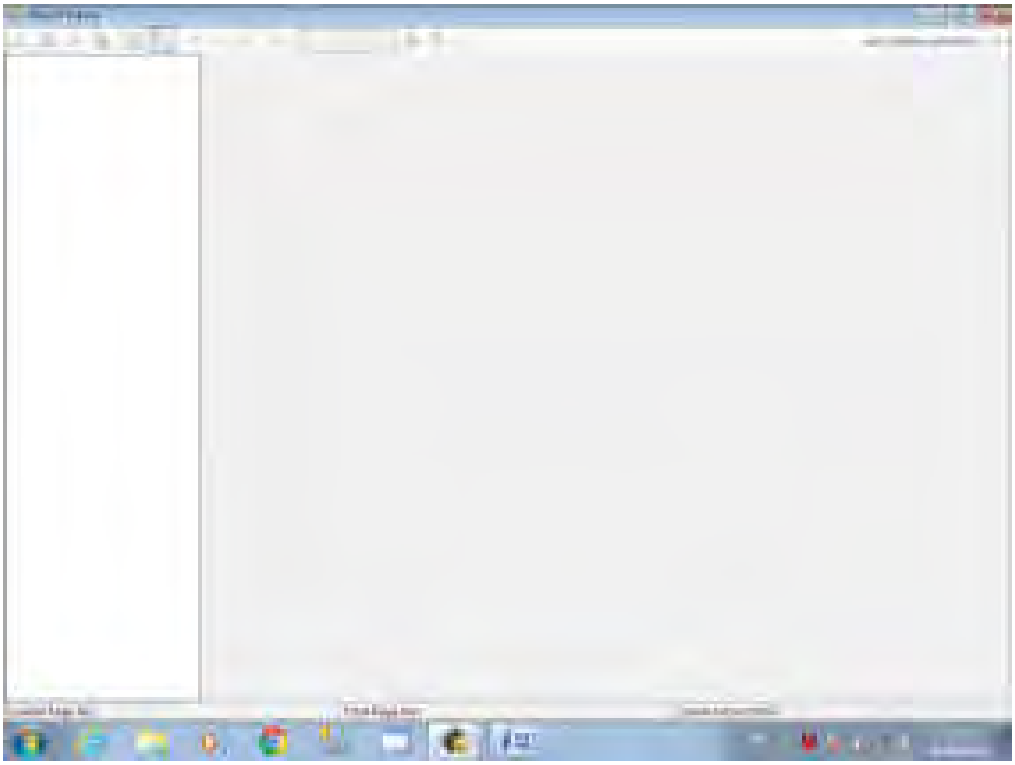




(6) Some functions are either not available or are greyed out in SBM2: "FRONT OFFICE", "METER MANAGEMENT" and "METER READINGS"

(reported by Mr. Kinange of Data Management)

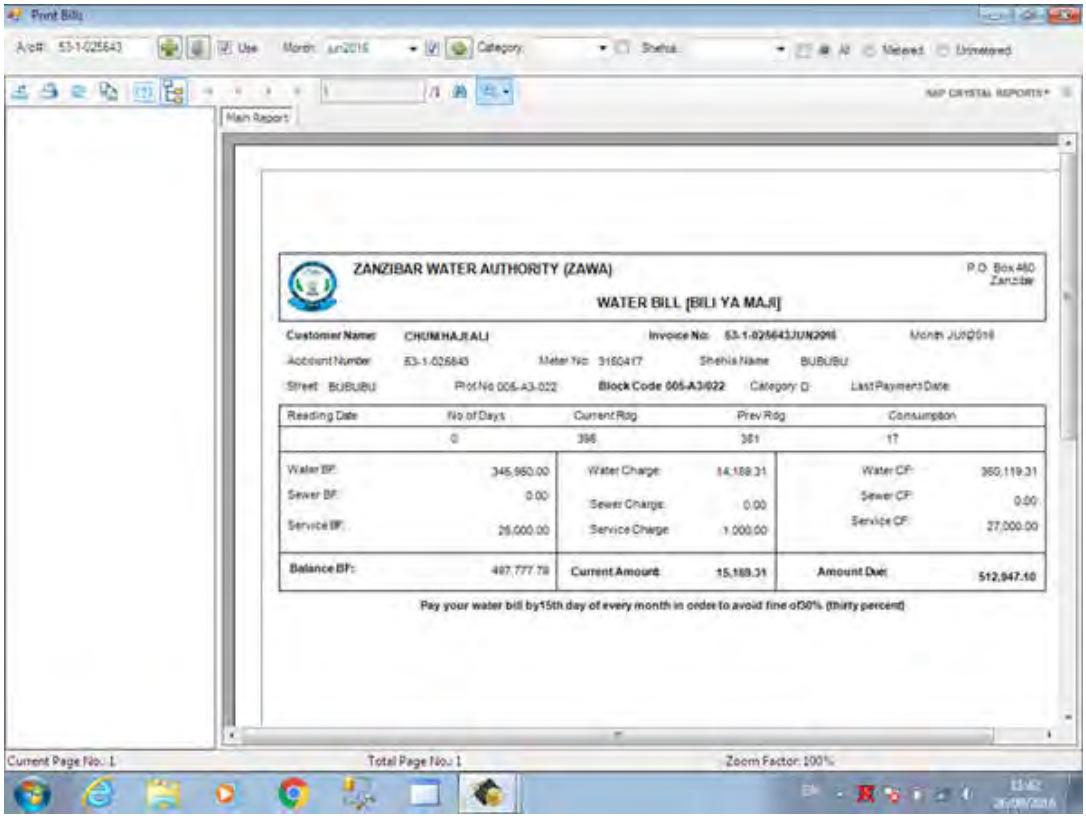
a. Payment history/report viewer

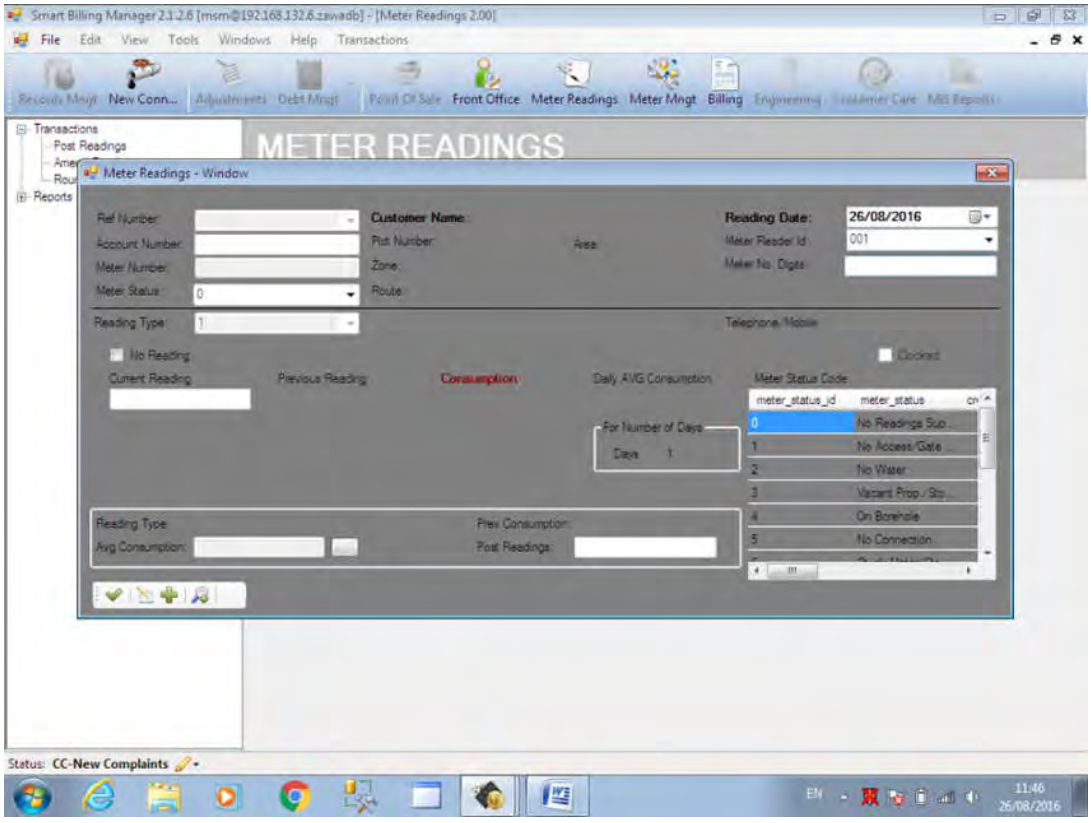


b. Generation of a complete list of registered meters.

c. No data on new connections can be recorded on SBM2. Balance/debts for new connections (only water related debts are recorded per customer in SBM2).

d. Information on customer bills including date of meter reading and subjected days of the bill. Such functions were activated in SBM1, but not in SBM2. The `Reading Date` button is available on the Meter Reading window but not functioning. On the same window, no box is available for recording the period of the billed water.

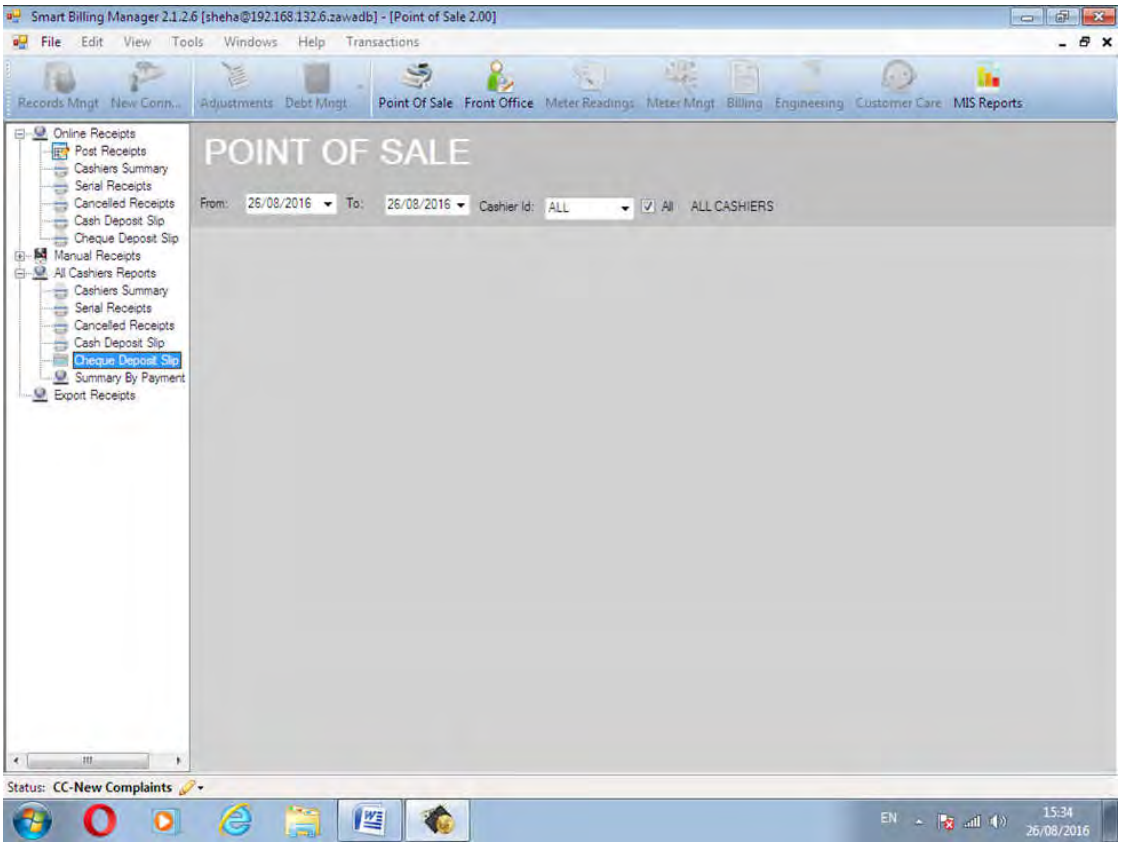

Print Bills
Main Report
ZANZIBAR WATER AUTHORITY (ZAWA)
P.O. Box 460 Zanzibar
WATER BILL [BILI YA MAJI]
Customer Name: CHUMHAJI ALI
Invoice No: 53-1-025643JUN2016
Month JUN2016
Account Number: 53-1-025643
Meter No: 3160417
Shehia Name: BUBUBU
Street: BUBUBU
Plot No 005-A3-022
Block Code 005-A3/022
Category: D
Last Payment Date:
Reading Date
No of Days
Current Rdg
Prev Rdg
Consumption
0
396
381
17
Water BF: 345,960.00
Sewer BF: 0.00
Service BF: 26,000.00
Water Charge: 14,188.31
Sewer Charge: 0.00
Service Charge: 1,000.00
Water CF: 360,119.31
Sewer CF: 0.00
Service CF: 27,000.00
Balance BF: 497,777.79
Current Amount: 15,188.31
Amount Due: 512,947.10
Pay your water bill by15th day of every month in order to avoid fine of30% (thirty percent)
Current Page No: 1
Total Page No: 1
Zoom Factor: 100%


Smart Billing Manager 2.1.2.6 [msm@192.168.132.6:zawadb] - [Meter Readings 2.00]
File Edit View Tools Windows Help Transactions
New Conn...
Front Office
Meter Readings
Meter Mngt
Billing
Transactions
Post Readings
Reports
METER READINGS
Meter Readings - Window
Ref Number:
Account Number:
Meter Number:
Meter Status:
Customer Name:
Plot Number:
Zone:
Route:
Area:
Reading Date:
26/08/2016
Meter Reader Id:
001
Meter No. Digits:
Reading Type:
Telephone/Mobile:
No Reading
Current Reading:
Previous Reading:
Consumption:
Daily AVG Consumption:
Meter Status Code:
meter_status_id
meter_status
0 No Readings Sup...
1 No Access/Gate ...
2 No Water
3 Vacant Prop./ Sto...
4 On Borehole
5 No Connection
For Number of Days
Days 1
Reading Type:
Avg Consumption:
Prev Consumption:
Post Readings:
Status: CC-New Complaints
EN
11:46
26/08/2016

(7) Smart Billing Manager/Online Receipts/Cheque Deposit Slip

(reported by Mr. Ali Sheha of Accounting)

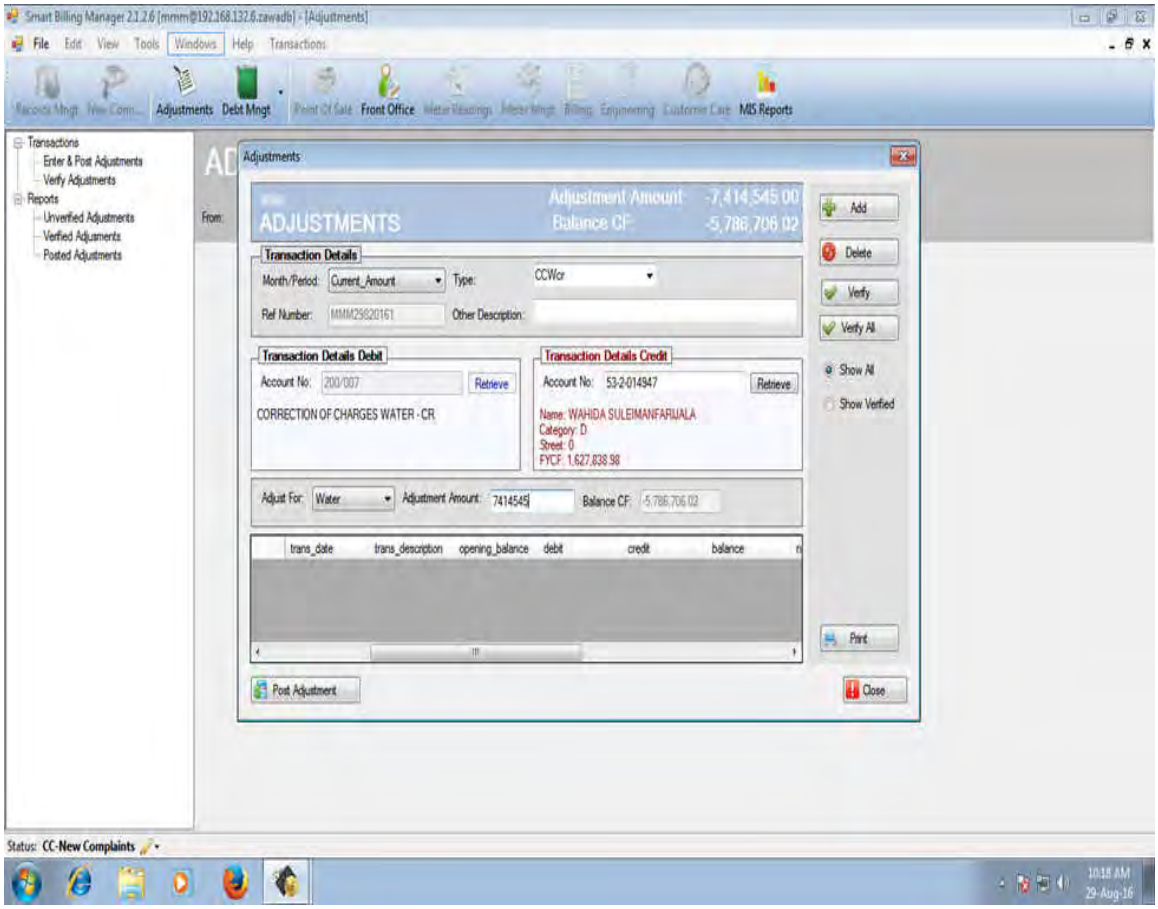
Cheques do not show up on the above windows but only appear when click All Cashier Reports/Cheque Deposit Slip. In the screenshot below, for privacy matter, the appeared cheque is not shown.



(8) Adjustments: "RECORD MANAGEMENT"

(reported by Ms. Mwanaharushi of Credit Control)

After making an adjustment, verification of the adjustment needs to be done one by one for each account instead of using the `Verify All` for a number of adjustments. In SBM1, all adjustments could have been seen in the assigned box below and the `Verity All` button could have verified all adjustments at once. However, in SBM2 this function is unavailable. Also, as another issue, the applied adjustment is not available anywhere to review after clicking the `Add` button.


Smart Billing Manager 2.1.2.6 [mmm@192.168.132.6.zawadb] - [Adjustments]
File Edit View Tools Windows Help Transactions
Adjustments
Debit Mngt
Front Office
MIS Reports
Transactions
Enter & Post Adjustments
Verify Adjustments
Reports
Unverified Adjustments
Verified Adjustments
Posted Adjustments
Adjustments
ADJUSTMENTS
Adjustment Amount: -7,414,545.00
Balance CF: -5,786,706.02
Transaction Details
Month/Period: Current_Amount
Type: CCWor
Ref Number: MMM29820161
Other Description:
Transaction Details Debit
Account No: 200/007
Retrieve
CORRECTION OF CHARGES WATER - CR
Transaction Details Credit
Account No: 53-2-014947
Retrieve
Name: WAHIDA SULEIMANFARIJALA
Category: D
Street: 0
FYCF: 1,627,838.98
Adjust For: Water
Adjustment Amount: 7414545
Balance CF: -5,786,706.02
trans_date
trans_description
opening_balance
debit
credit
balance
Add
Delete
Verify
Verify All
Show All
Show Verified
Print
Post Adjustment
Close
Status: CC-New Complaints
10:18 AM
29-Aug-16

6. Recommendations from Current Status Study

After reviewing the current status, the ICT improvement has the followings recommendations:

(1) SBM2; Recommendations

a. Correction of the exiting software bugs: errors, flaws, and failures such as:

- Formatting/typing issues
- Customer account`s issues
- Date of data entry issues
- Issues with online and manual receipts

b. Obtaining access to some functions that are currently either not available or greyed out such as:

- Payment history/report viewer
- Smart billing manager/online receipts/cheque deposit slip
- Generating reports/charts/figures

c. Enhancement of the software security

- Ensure ever user authorization meets properly with the required level of access
- Ensure no token accounts could be generated by fake users
- Eliminate any access to SBM2 on out-of ZAWA internet network

d. Revising the software maintenance service agreement with the vender

The current agreement with the vender (OIKOS) is very expensive. The agreed services are also highly limited in terms of the type of service and the number of days during the contract year.

e. Improve the SBM2 system hardware; recommendations include:

- Upgrades for the exiting SBM2 system hardware
- Power supply devices for hardware
- Consumer's supply

f. Negotiate with the vender (OIKOS) on correction of the above issues and the costs

This would help ZAWA to decide whether to keep the software or migrate to another customer service management software. The communication regarding to this issue started from 14th September 2016 between ZAWA and OIKOS.

g. Looking up for other utility software in the market in case of moving to other options

Two possible utility software are introduced to ZAWA for review; M@jics has been utilized by some African countries and Aquilium is currently being utilized by ZECO.

(2) GIS in HQs and District Offices; Recommendations

a. Setting up GIS in HQs and District Offices

The followings recommended items are prepared in details:

- Number of sets of PC Workstations for GIS, printers, receipt printer, UPS power back up, internet router,

- GIS software desktop reading from ZAWA HQ / concurrent user, GPS software, GPS receiver.
- Specification of the above items and the quantity
- Network connections between HQ and the branch offices for sharing database

b. GIS training for the staff both in HQs and District Offices:

- Purpose:
  1) to provide some basic training for selected branch staff (customer service and credit control staff)
  2) to identify those staff more interested and trainable in GIS as one of the ZAWA`s ICT for database
  3) to produce branches' GIS based database during the training course
- Type of training: On the job practical training
- First training: 20 members; from September 21 to December 21

7. The ICT Improvement Plan focusing on SBM and GIS

The GIS software has one concurrent user license, which has been installed in the IWRM server, and being shared among two Desktop Client machines, e.g. 2 in the GIS office and 1 in the IWRM office. Because of the restriction of available budget, the free GIS software (QGIS) shall be installed in District Offices and Paycenters.

ZAWA has 2 operational paycentres, namely Kijito Upele and Mombasa, and 4 District Offices, namely Koani (Central), Mahonda (North B), Gamba (North A) and Paje (South, under construction) and a newly proposed District Office at Mwera (Urban-West A). ZAWA has linked the Pay centre offices at KijitoUpele and Mombasa through the VPN by a private provider, and this enables information transfer to the HQs office in real time basis. The paycenters currently handle payments only. In the District Offices there's no network link from the HQs offices and these offices only handle offline payments, customer care services and O&M activities of facilities.

Based on this and the studies on current situation summarized in previous chapters from 1 to 6, the improvement plan of SBM and GIS system was developed as follows.

(1) Short-Term and On-Progress Set-Up

Office		Services	Facilities Required	Software's Required
Mwera	District Office (Proposed Urban-West A)	- Paying services - Customer care services - O&M of facilities	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO - 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software -Stand-alone QGIS -Arcpad software *Note: GIS Data Transfer to Headquarters by Memory stick*
Koani	District Office	- Paying services - Customer care services - O&M of facilities	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO - 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software -Stand-alone QGIS -Arcpad software *Note: GIS Data Transfer to Headquarters by Memory stick*
Mahonda	District Office	- Paying services - Customer care services - O&M of facilities	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO - 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software -Stand-alone QGIS -Arcpad software *Note: GIS Data Transfer to Headquarters by Memory stick*
Gamba	District Office	- Paying services - Customer care services - O&M of facilities	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO - 1 Pcs	-SBM Software -Stand-alone QGIS -Arcpad software *Note: GIS Data Transfer to Headquarters by*

Office		Services	Facilities Required	Software's Required
			-Cisco Router -Workstations – 2Pcs	*Memory stick*
Paje	District Office	- Paying services - Customer care services - O&M of facilities	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO - 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software -Stand-alone QGIS -Arcpad software *Note: GIS Data Transfer to Headquarters by Memory stick*
Kijito Upele	Pay Center (Proposed West B office)	- Paying services - Customer care services - O&M of facilities (future)	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Cisco Router -Workstations – 2Pcs	-SBM Software -Stand-alone QGIS -Arcpad software *Note: GIS Data Transfer to Headquarters by Memory stick*
Mombasa	Pay Center	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Cisco Router -Workstations – 2Pcs	-SBM Software -Stand-alone QGIS -Arcpad software *Note: GIS Data Transfer to Headquarters by Memory stick*

(2) Long-Term Set-Up

Office		Services	Facilities Required	Software's Required
Mwera	District Office (Proposed)	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO – 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software -ArcGIS software (reading from ArcGIS server from Headquarters) -Arcpad software -GIS Mobile software -GIS Extensions
Koani	District Office	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO – 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software -ArcGIS software (reading from ArcGIS server from Headquarters) -Arcpad software -GIS Mobile software -GIS Extensions
Mahonda	District Office	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer	-SBM Software -ArcGIS software (reading from ArcGIS server from Headquarters)

Office		Services	Facilities Required	Software's Required
			-Field Data Collectors JUNO – 1 Pcs -Cisco Router -Workstations – 2Pcs	-Arcpad software -GIS Mobile software -GIS Extensions
Gamba	District Office	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO – 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software ArcGIS software (reading from ArcGIS server from Headquarters) -Arcpad software -GIS Mobile software -GIS Extensions
Paje	District Office	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Field Data Collectors JUNO – 1 Pcs -Cisco Router -Workstations – 2Pcs	-SBM Software -ArcGIS software (reading from ArcGIS server from Headquarters) -Arcpad software -GIS Mobile software -GIS Extensions
Kijito Upele	Pay Center (Proposed West B Office)	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Cisco Router -Workstations – 2Pcs	-SBM Software -ArcGIS software (reading from ArcGIS server from Headquarters) -Arcpad software -GIS Mobile software -GIS Extensions
Mombasa	Pay Center	- Paying services - Customer care services	-VPN Network -Desktop PC - 2 Pcs -Power backup – UPS -Hp – Printer – A4/A3 -Receipt Printer -Cisco Router -Workstations – 2Pcs	-SBM Software -ArcGIS software (reading from ArcGIS server from --- Headquarters) -Arcpad software -GIS Mobile software -GIS Extensions

Stand Alone QG.I.S Data in the Districts will be collected and used in shapefiles Format to enable updates in the Headquarters as the Headquarters will be using Arcgis software

Paying Centres

Stand Alone Qgis - Software
17" Desktop PC - 2 Pcs
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS
Work Station

Paying Cente
Proprosed West B
District Office

KIJITO UPELE

Field Data Collectors (1 Juno) — Use of ArcPad Software

hp - A3 / A4 Printer

Receipt Printer

Cisco Router

Data FROM and TO SBM by VPN

G.I.S. Data FROM and TO the HQ Office by Transferable Memory Stick

MOMBASA

Stand Alone Qgis - Software
17" Desktop PC - 2 Pcs
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS
Work Station

Field Data Collectors (1 Juno) — Use of ArcPad Software

hp - A3 / A4 Printer

Receipt Printer

Cisco Router

Paying Cente

ZAWA Headquarters

VPN NETWORK
Net Work Provider - Short time

Concurrent User
17" Desktop PC Monitors
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS

GIS 1 Desktop Operator

Concurrent User
17" Desktop PC Monitors
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS

GIS 2 Desktop Operator

Concurrent User
17" Desktop PC Monitors
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS

GIS 3 Desktop Operator

Single User

GIS 4 Laptop Operator

Concurrent User / On Demand Use
17" Desktop PC Monitors
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS

GIS 5 Desktop IWRM Operator

Cisco Router

Network Cables

NETWORK HUB

Wireless Network

Network Cables

SERVER SBM

SERVER IWRM

Cisco Router

Field Data Collectors (3 GPS, Juno) — Use of ArcPad Software

Field Data Collectors

- Customer Service Centre — SBM Users; G.I.S. Information on Demand Only
- Credit Control — SBM Users; G.I.S. Information on Demand Only; Bill Distribution Routes; Disconnections Maps
- Database Centre — SBM Users; G.I.S. Information on Demand Only; Meter reading Routes
- Water Network Manager — G.I.S. Information on Demand Only; Leakage/Network OM; NRW Works
- Projects Manager — G.I.S. Information on Demand Only; Proposed and New Projects; Projects Design/ Survey/Estimates; Project Progress / Completion schedules
- Commercial Manager — G.I.S. Information on Demand Only; Customers Location; Advise on Unmetered/ Non Connected; Advice on different consumer categories
- IWRM — G.I.S. Information on Demand Only

District Offices (D/O)

Stand Alone QG.I.S Data in the Districts will be collected and used in shapefiles Format to enable updates in the Headquarters as the Headquarters will be using Arcgis software

MWERA

Proposed Urban West A D/O & Paying Centre

Stand Alone Qgis - Software
17" Desktop PC - 2 Pcs
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS
Work Station

hp - A3 / A4 Printer

Receipt Printer

Field Data Collectors (1 Juno) — Use of ArcPad Software

G.I.S. and SBM Data FROM and TO the HQ Office by Transferable Memory Stick

KOANI

Central D/O & Paying Centre

Stand Alone Qgis - Software
17" Desktop PC - 2 Pcs
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS
Work Station

hp - A3 / A4 Printer

Receipt Printer

Field Data Collectors (1 Juno) — Use of ArcPad Software

G.I.S. and SBM Data FROM and TO the HQ Office by Transferable Memory Stick

MAHONDA

North B D/O & Paying Centre

Stand Alone Qgis - Software
17" Desktop PC - 2 Pcs
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS
Work Station

Field Data Collectors (1 Juno) — Use of ArcPad Software

hp - A3 / A4 Printer

Receipt Printer

G.I.S. and SBM Data FROM and TO the HQ Office by Transferable Memory Stick

GAMBA

North A D/O & Paying Centre

Stand Alone Qgis - Software
17" Desktop PC - 2 Pcs
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS
Work Station

Field Data Collectors (1 Juno) — Use of ArcPad Software

hp - A3 / A4 Printer

Receipt Printer

G.I.S. and SBM Data FROM and TO the HQ Office by Transferable Memory Stick

PAJE

South D/O & Paying Centre

Stand Alone Qgis - Software
17" Desktop PC - 2 Pcs
CPU 500gb RAM 8GB, Nvidia graphics 64 Bit
Power Backup - UPS
Work Station

Field Data Collectors (1 Juno) — Use of ArcPad Software

hp - A3 / A4 Printer

Receipt Printer

G.I.S. and SBM Data FROM and TO the HQ Office by Transferable Memory Stick

Figure Short-Term GIS Systems Set-Up

Project Name	The Technical Cooperation Project for Enhancement of Water Supply Management of Zanzibar Water Authority Phase 2
Drawing Title	GIS AND SBM IMPROVEMENT IN ZAWA ArcGIS & Open Source Qgis Software
Scale	NTS
Drawing No.	GS - 002 - 2016

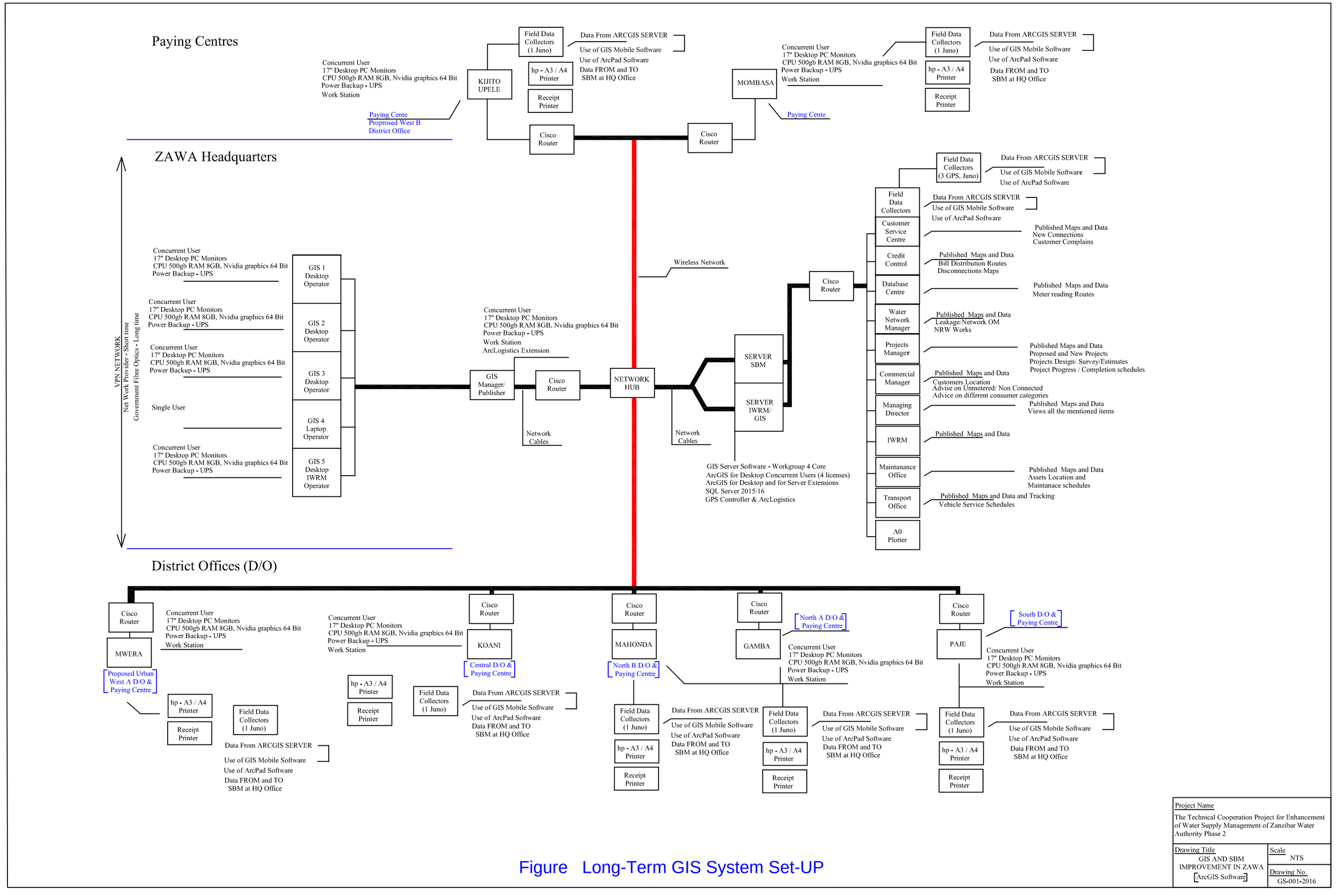


Figure Long-Term GIS System Set-UP

Expected Roles and Solutions Including Software Integration

	Expected Roles and Related Departments of ZAWA	How to Implement This?
(a)	**At the Customer Service**	
1	Receive field complaints from customers by calls	Estb. VOIP, Trunk Calling system
2	Receive field complaints from customers by internet	Web Portals with inquiry
3	View customer records from the SBM/Billing software	Billing system with rights
4	Allow the c/service to send requests to the concerned depts	Billing system with event logs
5	Allow the c/service to view the location of the request on GIS map	GIS Web Portal
6	Send the requests to the field agents by vieweing the locality of the field crew	An application with GIS / crew tracking / workorder system / billing / inventory systems
7	Connect to the stores people to know if theres need to give some supplies to the field crews	ditto
8	Receive new applications and direct them to the Database Section for futher advice	Billing system
9	Organize for new connections to be fixed with regard to the Technical Operation Department and Database Section	Billing system with logs
10	Forward the data of new connection to Database Section to record on SBM/GIS	Billing system with logs
(b)	**At the GIS Department**	
1	Share data to all departments at ZAWA	GIS web portal
2	Receive information from the other departments from technical/planning	Billing system with logs / GIS web portal
3	Collect data from the field	Mobile GIS / GIS web portal / GPS receivers
4	Integrate with the Billing database/Accounting software	GIS web portal application
5	Integrate with GeODIN	Desktop application
6	Fix the GPS tracking systems to ZAWAs field cars	Car tracking device / Customised base map
7	Track the field vehicles and feedback to the customer service on the locality	ditto
8	Create some employees information and the daily allocation from Technical Opertion or HR: this makes it easy to enable the c/service to know who to contact in time of need.	GIS web portal
(c)	**At the Technical Operations Department**	
1	Coordinate with the planning department on the projects	Create a feature dataset allowance in the GIS portal that allows the Tech dept to record details etc.
2	Keep the records of the projects / the profiles / the details	ditto
3	Have a proper recording system / data capturing system	ditto
4	Share the information to the GIS department / the O & M / Meter reading / Disconnection / Reconnections	ditto
5	Coordinate the leakage management / repair / keep the recors / share the records with GIS depat.	ditto
6	Assign each day the employees in the tech dept. where they will work	Liase with daily logs (can be done as a form)
7	Give the stores issue authorty sheets allowing the employees to pick up the requires equipment	Make an Electronic Store Issue Authority that allows the managers to be authorised based on the stock levels in Inventory
8	SCADA Viewer and integration	Enough data has to be collected first and set up other systems
(d)	**At the Credit Control Section**	
1	Conduct meter reading reglularly and forward the reading data to Database Section	Billing system
2	Receive the printed bills from Database Section and deliver them regularly to metered cusomers	Billing system
3	Handle claims regarding bills from customers and adjust the bills if necessary	Billing system
4	Receive the disconnections list from database/SBM based on some agreed policy (currently none)	Disconnection list generation by billing system
5	Contact the GIS depat and get the location the disconnections	Integrate the disconnection table to GIS
6	Disconnect and submit the feedback to the database/ SBM section	Feed back mechanism to the Database Section
(e)	**At the Metering Section**	
1	Run meter tests / repairs and replacements	Meter testing bench/ data capture forms/ meter test request and consent from customer forms
2	Record purchased/tested/installed/replaced meters on water meter database	Create water meter database; Build linkage of water meter database to SBM/GIS
3	Plan on the above prepare meter maintanace team	Metering Unit establishment / Data capture e-forms
4	Receive complains from the customer service	Billing system with logs

(f)	**At the PRO**	
1	Receive information from the customer service and the SBM	Billing system with logs
2	Broadcast the information to the public on various concerns	ZAWA web / the most suitable manner of advertisement
(g)	**At the Database Section**	
1	Receive new customers and assign the account numbers	Billing system with logs
2	Receive the meter readings and plan for meter reading activities	Meter reading system
3	Produce disconnection lists and forward to the credit control	Disconnection from the Billing system
4	Produce bills and ensure the distribution	Bil distribution / physically or through SMS
5	For new customers send the information to the GIS section for updating / as built drawings	Physically forward the hardcopy of as-built drawings
(h)	**At the Water Development Department**	
1	Plan for the daily activities	
2	Plan for the implementation of future projects	
3	Organise for the current projects / operation to completion	
4	Project design and BOQ	
5	Coordiante the Network O & M / Planning department activities	
(i)	**At the Water Resource Section**	
1	Issue permits	APP for permits issuance following certain set policies
2	receive borehole sinking requests and evaluate	Applcation forms and evaluations using certain policies
3	Organize for the works associated	Office duties
4	Get data from Other related organisations / the Meteological / Agriculture	Data sharing policy
5	Lias with the Water resources management centre in dar to get more information on their working style.	Benchmarking
6	Water shed / Flood Plains delienation	ArcHydro/ GeODIN / GIS collect enough data
(k)	**At the Transport Section**	
1	Issue Work Permits	
2	Issue Fuel	
3	Schedule for Maintance	
4	Ensure all Tracking devices are working properly	
5	Ensure Insurance on all vehicles and due dates	
6	Know the designation of all vehicles within the day	
7	Keep a Copy of all drivers driving licences / government driving licenses	

ZAWA G.I.S Training Program (21st September to 21st December , 2016)

Introduction to G.I.S. - QGIS

Name of ZAWA Counterparts	ZAWA Trainees - 1st Batch	Designation	
Said Mussa Khamis	Mahmoud O Makame	Customer Service	+ 8 graduates of 2014-2015 program
Hisham Mabrouk Khamis	Ali Juma Zubeir	Customer Service	
Kombo Ali Hassan	Mwantum Swelum Ali	Customer Service	
Mohammed Ali Khamis	Munira Issa Hakim	Customer Service	
Ali Said Mohammed	Abeida Nassor Mussa	North A District	
	Ithna Kasim Saleh	Central District	
	Salma Ali Kesi	North B District	
	Vuai Jabir Yange	Credit Control	
	Iddi Khalfan Idd	Credit Control	
	Saleh Said Aboud	Credit Control (Commercial Users)	
	Hashim Iddi Simba	Credit Control (Institution)	

Date		Time		Content	Venue	ZAWA Lecturer	JICA/NJS
Day 1 - 3	Sep 21 (Wed), Sep 26 (Mon), Sep 28(Wed)	AM	9:30~	Introduction to GIS - QGIS	Mombasa Office	Hisham Mabrouk	Francis Murathi
			10:15~	Relevance to ZAWA in improving service and		Said Mussa	
			10:45~	Collection			
			12:00~				
Day 4	Oct 3 (Mon), Oct 5 (Wed), Oct 10 (Mon)	AM	9:30~	Vector Data	Mombasa Office	Said Mussa	Francis Murathi
			10:15~	Examples		Hisham Mabrouk	
			10:45~				
			12:00~				
Day 5	Oct 12 (Wed), Oct 17 (Mon), Oct 19 (Wed)	AM	9:30~	Vector Attributes and Data	Mombasa Office	Said Mussa	Francis Murathi
			10:15~	How to Use SBM / GIS Data		Hisham Mabrouk	
			10:45~				
			12:00~				
Day 6	Oct 24 (Mon), Oct 26 (Wed), Oct 31 (Mon)	AM	9:30~	Data Capture	Mombasa Office	Mohammed Ali Khamis	Francis Murathi
			10:15~	GPS Use, SC Survey Sheets and Data Collection		Ali Said	
		PM	10:45~	Encoding Data in excel and GIS		Said Mussa & Kombo Ali	
			12:00~				
Day 7	Nov 2 (Wed), Nov 7 (Mon)	AM	9:30~	Raster Data	Mombasa Office	Hisham Mabrouk & Said Mu	Francis Murathi
			10:15~	(About Use of Images/ Georeferencing and		Mohammed Ali Khamis	
		PM	10:45~	Capture)			
			12:00~				
Day 8	Nov 9 (Wed), Nov 14 (Mon), Nov 16 (Wed)	AM	9:30~	Coordinate and Reference Systems	Mombasa Office	Said Mussa	Francis Murathi
			10:15~	Map Projections		Hisham Mabrouk	
		PM	10:45~				
			12:00~				
Day 9	Nov 21 (Mon), Nov 23 (Wed), Nov 28 (Mon)	AM	9:30~	Map Production	Mombasa Office	Mohammed Ali Khamis	Francis Murathi
			10:15~	Maps Exercises - With Data		Kombo Ali Hassan	
		PM	10:45~				
			12:00~				
Day 10	Nov 28 (Mon), Dec 5 (Mon), Dec 7 (Wed), Dec 12 (Mon), Dec 14 (Wed)	AM	9:30~	Credit Control and Use of GIS	Mombasa Office	Said Mussa	Francis Murathi
			10:15~	GIS In Civil Works		Mohammed Ali Khamis	
		PM	10:45~	GIS in Metering - Walks		Hisham Mabrouk	
			12:00~	GIS in Project Planning and Data Updates		Said Mussa	
Day 11	Dec 19 (Mon), Dec 21 (Wed)	AM	9:30~	Use of Microsoft Access	Mombasa Office	Said Mussa	Francis Murathi
			10:15~	Use of Microsoft Excel in data management		Hisham Mabouk	
		PM	10:45~	Course Closure		Kombo Ali Hassan	
			12:00~			Mohammed Ali Khamis	

(2) Output-2: Position and Job Description of ZAWA's Staff

List of Developed Job Descriptions for Current Designations as of June 2016

Depart-ment /Unit	Section & Sub-Section		Designation	No.	Name
Director General				D1	Mustafa Ali Garu
Commer-cial	Director			C1	Kazija Mussa Msheba
	Credit Control		Credit Control Officer	C2	Rashid Juma Khamis
			Asst Credit Control	C3	Mwanaharusi Mwinjuma Mgeni
		Billing Large Customers	Asst Credit Control	C4	Bilal Makarani Sarboko
		Billing Institu-tional Customers	Asst Credit Control	C5	Ali Said Khamis
		Billing Domestic Customers	Bill Attendant	C6	Mkasi Haji Zubeir
		Meter Mechanic	Technician (Domestic)	C7	Vuai Jabir Yange
			Asst Technician (Meter Man-agement)	C8	Bilal Khalid Abass
			Plumber (Smaller Pipes)	C9	Mikidadi Mbaruk
	Customer Service		Customer Service Officer	C10	Mahmoud Omar Makame
			Asst Customer Service	C11	Saleh Said Aboud
			Customer Care (Surveyor)	C12	Yusuf Shaib Yusuf
			Customer Care (Data Entry)	C13	Salma Ali Keis
	Data Management		Database Officer	C14	Maulid Kinange Haji
			Asst Data Entry (GIS)	C15	Said Musa Khamis
			Data Entry (Billing)	C16	Makame Haji Iddi
Finance & Admin-istration	Director			F1	Ali Tamin
	Planning & Policy		Planning & Policy Officer	F2	Asma Ahmed Mohamed
			Asst Planning & Policy Officer	F3	Namboto Ali Hamdu
		Office Supervi-sion	Office Supervisor	F4	Atiki Wazir Suleiman
			Secretary DG	F5	Raya Salum Abdalla
			Cleaner	F6	Fatma Shehe Msuri
		Transportation	Transport Officer	F7	Abdallah Ali Khamis
			Asst Auto Mechanic	F8	Name unidentified
			Driver (MV)	F9	Abdulrahman Ame Silima
	Human Resources		HR Officer	F10	Hasan Juma Ali
			Asst HR Officer (Administra-tion)	F11	Omar Haji Omar
			Asst HR Officer (Training)	F12	Said Mwinyi Mwinshehe
			Asst HR Officer (Payroll)	F13	Amir Rajab Shaaban
		Registry	Chief Registry Clerk	F14	Riziki Abass Vuai
			Messenger	F15	Ramadhan Amir Mbarak
			Salary Clerk	F16	Safia Is-hak Yussuf
	Account-ing		Chief Accountant	F17	Zuleifa Kassim Saleh
			Accountant (Revenue)	F18	Mwanakombo Vuai Mgeni
			Accountant (Projects)	F19	Seif Shaaban Seif
		Cashier	Asst Accountant (Revenue)	F20	Ali Sheha Khamis
			Asst Treasurer	F21	Haji Makame Sheha
			Cashier (Revenue)	F22	Mwanaisha Suleiman Mo-hamed
Technical Operation	Director			O1	Maulid Hassan Khamis
	Water Produc-tion		Water Production Officer	O2	-
		Electrical	Engineer (Electrical)	O3	Ali Abdu Ali
			Technician (Electromechanical)	O4	Husein Ame Njuma
			Electrician	O5	Hassan Haji Kongo
			Artisan (Electrical)	O6	Shaaban Hemed Vuai
		Mechanical	Engineer (Mechanical)	O7	-
			Technician (Mechanical)	O8	Mzee Kondo Mwinyi
			Artisan (Mechanical)	O9	Hassan Khamis Hassan
			Pump Operator	O10	Ali Chande Ali
			Plumber (Large Pipes)	O11	Mzee Hamad Mzee
			Pump Operator	O12	Omar Juma Mselem
		Workshop	Engineer (Workshop)	O13	Khalfan Omar Juma
			Fitter&Turner	O14	Abdallah Nassor Said

Depart-ment /Unit	Section & Sub-Section		Designation	No.	Name
	Water Network		Water Network Officer	O15	Mohamed Hamdu Haji
			Civil Engineer (Civil)	O16	Omar Zubeir Kombo
			Asst Engineer (Civil)	O17	Noor Issa Abdallah
			Plumber	O18	Safia John Bondola
		Pipe Technician	-	-	
	District Office		Asst District Water Officer	O19	Othman Mohamed Othman
Water Develop-ment	Director			W1	Mohamed Ilyasa Mohamed
	Monitoring & Evaluation		Monitoring and Evaluation Officer	W2	Hakim Ali Kimara
			Asst Monitoring and Evaluation Officer	W3	Asha Mtumwa Jecha
	Water Resources		Geologist	W4	Haji Shaaban Haji
			Engineer (Mechanical)	W5	Mohamed Abdallah Khatib
			Asst Engineer (Mining)	W6	Kazija Ame Thabit
			Technician (Mining)	W7	Hassan Zahran Haji
		Laboratory	Technician (Laboratory)	W8	Amir Nahoda Mwadin
	Planning and Pro-ject Man-agement		Engineer (Civil Construction)	W9	-
			Engineer (Planning&Design)	W10	Pilly Masoud Kaku
		Mapping	Water Technician	W11	-
		Civil Construction	Carpenter	W12	Said Othman Ali
			Mason	W13	Khatib Ali Salum
		Water Tanks	Technician (Water Tank)	W14	Ali Juma Ame
	Research, Innovation and De-velopment		Research, Innovation and De-velopment Officer	W15	Rukia Masheko Ali
			Asst Research, Innovation and Development Officer	W16	Khamis Ame Mnubi
Public Relations			Public Relations Officer	U1	-
			Asst Public Relations Officer	U2	Amina Abdalla Daud
Legal			Legal Officer	U3	Khadija Makame Juma
			Asst Legal Officer	U4	Shaaban Juma Shaaban
Audit			Audit Officer	U5	Jombi Kheri Karama
			Asst Audit Officer	U6	Kombo Haji Makame
Procurement			Procurement Officer	U7	Othman Juma Othman
			Asst Procurement Officer	U8	Haji Idrissa Haji
		Warehouse	Store Keeper	U9	Said Aboud Hamdan
			Asst Store Keeper	U10	Haidar Khamis Ali
ICT			ICT Officer	U11	Salim Suleiman Khatib
			Asst ICT Officer	U12	Mwinyi Hassan Hakim

ZANZIBAR WATER AUTHORITY

P. O. Box 460
ZANZIBAR

Tel/Fax : +255 24 2231151
E-mail : zawa@zanzinet.com

P. O. Box 59, Chake Chake,
PEMBA

Tel/Fax : +255 24 2452652
E-mail : zawape@zanzinet.com

Job Descriptions (Management)

Fiscal Year: **2016/2017**

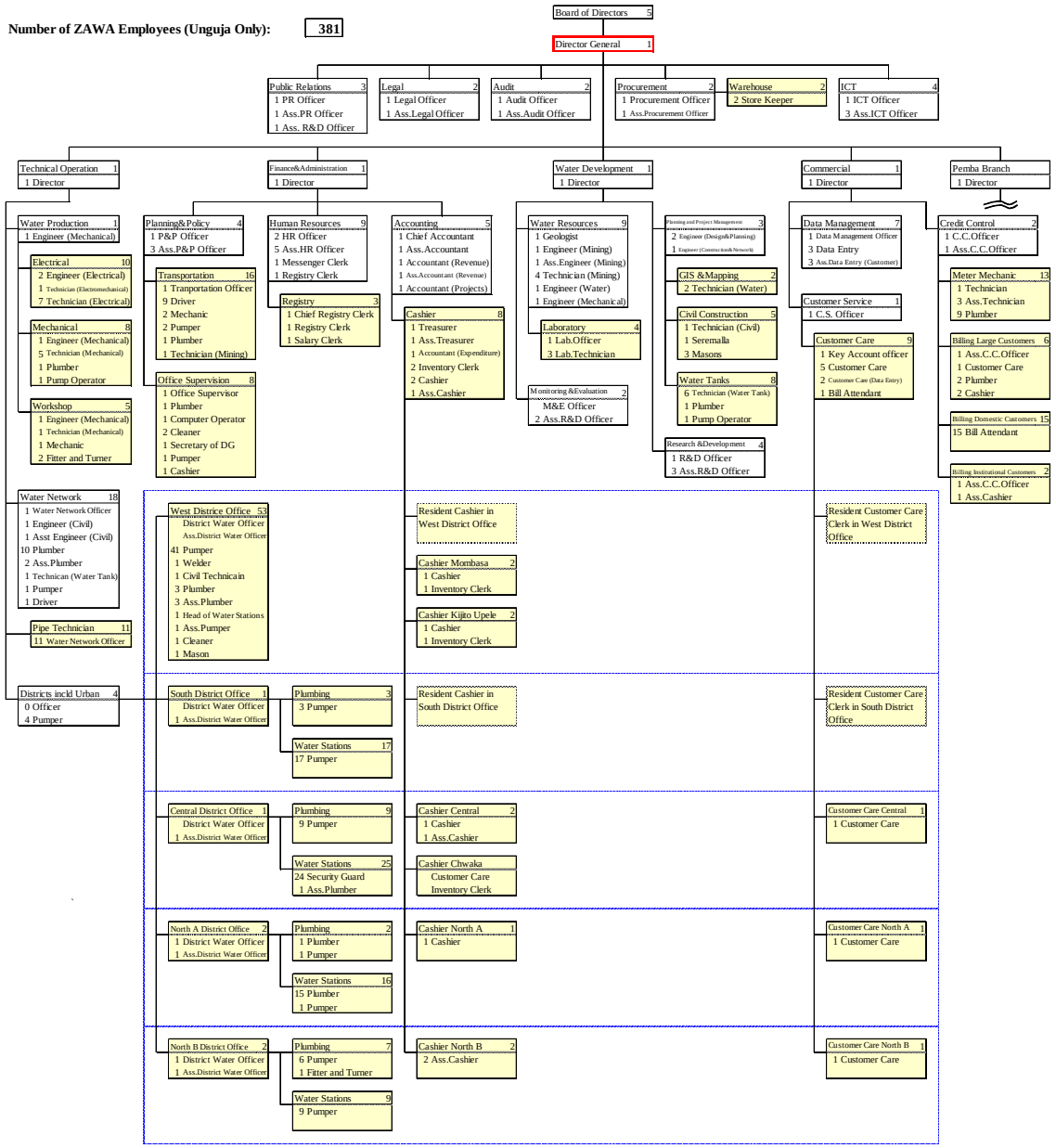
Job Title: **Director General**

Department / Unit/ Section/ Sub-Section:

Job Holder: **Mustafa Ali Garu**

Agreement Status	
Agreed Date by Job Holder (with Date and Signature)	
Agreed Date by Supervisor (with Date and Signature)	
Agreed Date by Controlling Officer (HOD) (with Date and Signature)	
Last Updated	03/05/2016
Agreed Measurable Standards and Targets (Done for Every Year)	
This Year's Standards	No standards set.
Targets Agreed with Supervisor for the Year	No targets set.

Organization Chart (How the Job is Positioned)



1. Job Purpose (The reason why the job was established)	
To cost effectively and efficiently lead and motivate to plan, organize, coordinate, direct, monitor and control the overall performance of ZAWA/Authority through guidance, coaching and harmonization of the business output with a view to competitively produce and supply acceptably clean and safe water that proactively translate the needs of the Zanzibar and international people while actively contributing to the development of ZAWA and Zanzibar.	
2. Principle Accountabilities with End Results	
Principle Accountabilities	End Results
a) Provide leadership, direction and motivation to various Directorates, Branch and District Water Centers through Zanzibar legislations and Board of Directors' approved policies, rules, guidelines, procedures and regulations regarding strategic and operational plans in marketing the Authority to the Management team, interpreting/disseminating same through directives, circulars, meetings and consultations while highlighting pertinent areas of attention or concern aimed at taking them through proper direction to achieve overall positive performance of ZAWA.	Strategically effective way of harnessing coordination and immediate brokerage to procure culture, commitment and identity at corporate level in a businesslike manner.
b) Develop and evolve policies that support ZAWA's core business of selling clean and safe water to Zanzibar and international people in response to needs of both urban and rural sector of the economy harnessing the technical and professional support from management team with a view to have excellent performance of the ZAWA operating systems in modern and international standards.	Demand oriented attained by professionally international excellence.
c) Approve proposals on operational guidelines from management members as developed from various spheres of understanding but after carefully scrutinizing and satisfying oneself the direction in which they address the core business of clean and safe water supplying on sale and solicit for Board's approval prior to implementation with a view to maintain the vision and mission of ZAWA.	Teamwork and ownership of operational guidelines enhanced.
d) Facilitate operations of departments by providing moral and material support aimed at achieving of both strategic and operational goals and objectives of the RGoZ for creating ZAWA; and operational levels of the Authority, Pemba Branch and District Centers.	All levels facilitated to attain goals and objectives.
e) Secure adequate source of financing within the organization by strictly availing an appealingly viable budget and where beyond capacity extend need from local and international sources with a view to sustain capabilities and capacities for carrying out ZAWA operations and provide adequate support Pemba Branch and District Water Centers.	Financial sustainability that meets objectives is maintained.
f) Create conducive atmosphere of operating ZAWA business by advocating compliance to procedures, rules and regulations that are in line with statutory requirements such as auditing for financial and systems control, inspections of networks and training center with a view to attaining regulative and legislative obligations.	Legislations and regulations on operating standards conformed.
g) Monitor Branch, directorates and District Water Centers by going through reports and paying visits to observe implantation of activities while obtaining suggestions and advice, raising queries on anomalies and outright poor performance and provide corrective measures all aimed at controlling deviations from set procedures, rules and regulations with a view to support and harmonize efforts towards achieving desired goals and objectives.	Organizational operating procedures monitored and deviations controlled.

h) Actively maintain proper communication and vibrant relations with partner institutions as well as at internal and external stakeholders through forums, exhibitions, various media and exchange of visits with a view to learning more about business by creating, attracting and maintaining awareness of ZAWA activities.	Corporate image enhanced thus opening up more business with confidence.
i) Maintain and recommend to the Board on respective appointing authority basis adequate levels and qualitatively right competencies by appointing, training, promoting, transferring, demoting, and dismissing staff in a view to retain and effectively utilize competent human resources that can achieve expected business levels of (revenues collection- goal) that meet objectives (costs).	Only productive human resource retained and utilized.
j) Prepare and submit to the Board quarterly, semi and annual comprehensive action plans, consolidated budgets for operations and training needs indicating practical controls in place and highlight areas of pertinent interest for the Board support with a view to maintain performance standards and ultimate achievement of goals and objectives.	Board appraised on performance and Management put into vows to achieve.

3. Critical Result Areas (Mainly 3-4 only and its 80% achievement base)

a) Proactively motivating leadership that critically and comprehensively adopt and use the path toward vision without waver.
b) Monitor effectively the performance of his team and motivate to keep on directing efforts to achieve goals and objectives (effective guidance and cost effective utilization of resources)
c) Coordination and teamwork that focus on goals and objectives with harmony.
d) Controlling of any deviation with utmost discipline on operating procedures, rules and regulations.

4. Job Context (Sphere of action and influence - relations)

This is a Chief Executive Officer's function, accountable to the Board of Directors for the provision of leadership, direction and guidance on doing business cot effectively and efficiently in order to ensure economic viability on investment.
The post demands that leadership of seriously visionary with tact and diplomacy in dealing with a multi-disciplinary and multi-national management teams i.e. the owners of ZAWA – RGoZ through Ministers and Principal Secretaries, officials and Directors of the BOARD; diverse donors and financiers, dire water customers and ZAWA providers/suppliers. The only one and none other reporting to the Board of Directors.

5. Supervisory/Managerial Breadth/Authority to Exercise

The post demands use of managerial, economic, technical, social and political abilities to enable effective direction, leadership and coordination.

6. Number and Level of Immediate Subordinates

See Organization Chart but 5 directors and 5 Heads of Units.

7. Knowledge and Skills Requirement

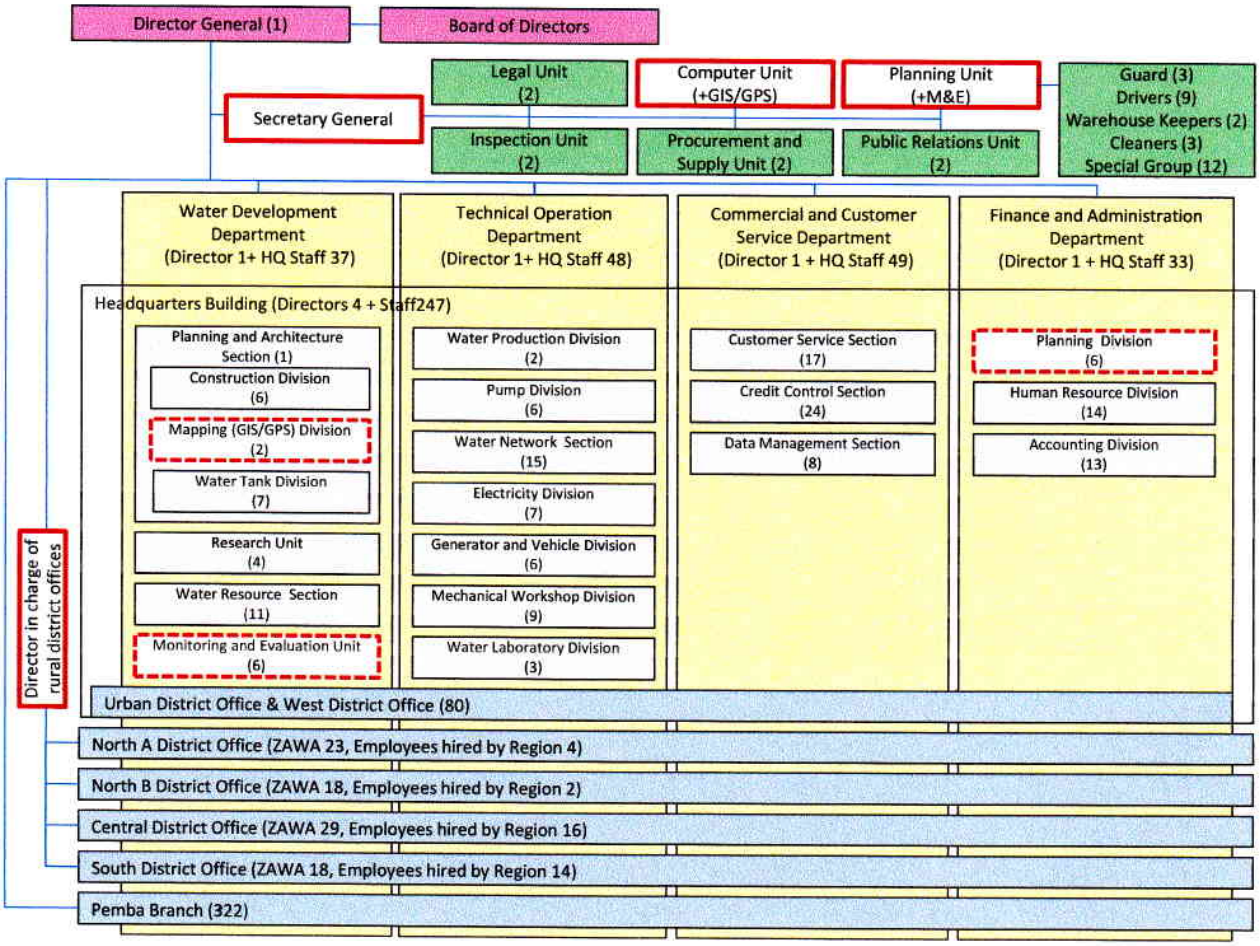
7.1 General Education	Form VI with passes in Science subjects (Maths. Physics & Chemistry) or Arts (Mathematics Economics and Accountancy).
7.2 Professional /Vocational Qualification	MSc Engineering in any field and on advantage PhD in Water Management.
7.3 Relevant Pre-Job Experience	12 years in top management with at least 6 as Head of a business institution advantageously being water institution.
7.4 Managerial Skills	Must be able to ferociously plan, organize, coordinate and control overall business objectives of the authority.
7.5 Entrepreneurial Skills	Should have run a business worth a Tshs 5/bn annual turnover.
7.6 Physical Skills	Should be able to use IT equipment and self drive where necessary.

7.7 Communication Skills	High level tact and diplomacy is required to express needs of the authority comprehensively at internal and international levels at fluent English and Kiswahili and preferably another second foreign language.
7.8 Numeric/Computing Skills	Be able to use simple scientific formulae.
7.9 Analytical Skills	Should be able to analyze national and regional requirements (refer vision of ZAWA) and come out with conducive strategic plans which if implemented can meet and tackle challenges to make organization meet own goals and objectives.
7.10 Responsibility for Resources	Without controlling effect on resources jobholder may cause losses in terms of investments without revenue in billions.
7.11 Human Relations	Ability to harness efforts of others and evolve teamwork that can weave power that produces wealth. Should be able also to promote corporate image internally and externally through use of tact and diplomacy.
8. Environmental and Other Features	
8.1 Working Conditions	Normal office conditions.
8.2 Physical Effort	Sedentary work associated with light exhaustion.
8.3 Hazards	Road and air hazards but probability of occurrence is remote. Mental stress though relaxation facilities are plenty.

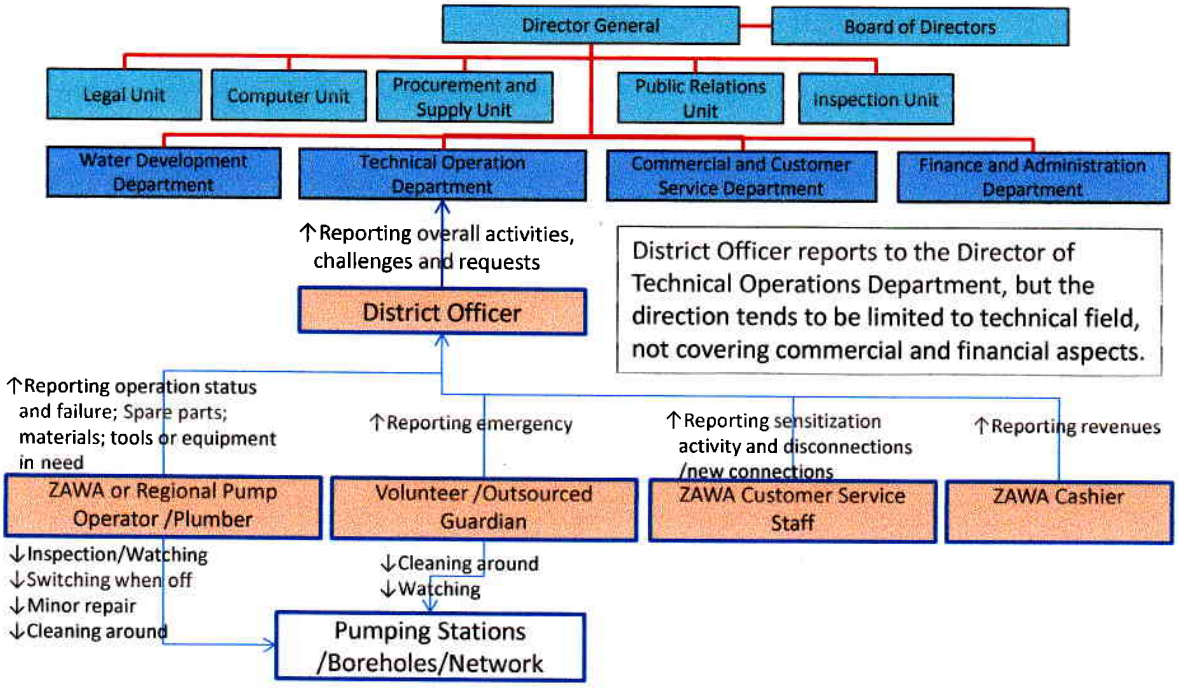
The End

(3) Output-2: Draft Organigram of ZAWA

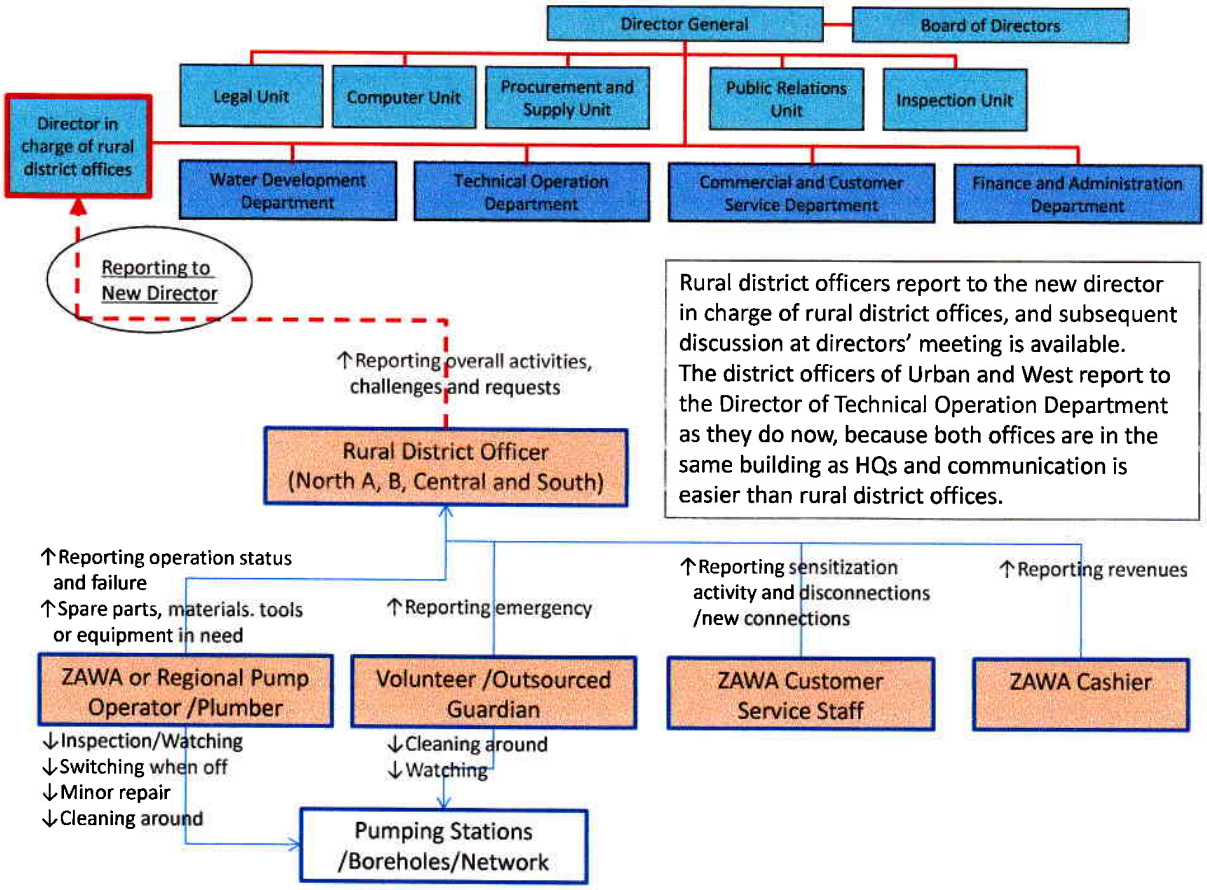
Appendix 1: Proposed Organogram



Appendix 2: Present Reporting Line from District Officer to ZAWA HQs



Appendix 3: Proposed Reporting Line from District Officer to ZAWA HQs



Appendix 4: Job Description of the New Director in charge of Rural District Offices

The Director in charge of Rural District Offices shall accomplish the following tasks concerning the District Offices of North A, North B, Central and South, under the full cooperation and coordination with other directors of ZAWA:

1. To ensure that suitably sized and staffed district offices are established, through supervising and monitoring their plans and performance, in order to bring operations and maintenance activities closer to customers.
2. To ensure that necessary skills, resources and supports exist to service supply activities in all the district offices.
3. To ensure that the functions, programs and staff are coordinated for efficiency and effectiveness in all district offices.
4. To ensures the full cooperation and coordination with the existing departments and units in ZAWA HQs, by means of providing comprehensive reports and enhancing discussion/ communication among the stakeholders.

Appendix 5: Job Description of the Secretary General

The Secretary General shall accomplish the following tasks in support of the Director General, in order to provide the regulatory/ supporting functions of headquarters and to enhance discussion/ communication among the stakeholders:

1. To ensure that suitably sized and staffed units are established, through supervising and monitoring their plans and performance, in order to provide the effective regulatory/ supporting functions from/ within the headquarters.
2. To ensure that necessary skills, resources and supports exist to the assigned tasks in all the units.
3. To ensure that the functions, programs and staff are coordinated for efficiency and effectiveness in all the units, under the full cooperation and coordination with all the departments, branch and district offices.

…End…

The Expert Team of JICA Technical Assistance

(NJS Consultants Co., Ltd.)

6-8 Tomihisa-cho,
Shinjuku-ku, Tokyo
162-0067 Japan

TEL : 81-3-5919-7452
FAX: 81-3-5919-7454
E-mail; njs@nifty.com

NJS-ZAWA P2Y3_004

On the 16th day of June 2014

Dr. Mustafa Ali Garu
Director General,
ZAWA, MLHWE, Tanzania

Re.: The Technical Cooperation Project for Enhancement of Water Supply Management of Zanzibar Water Authority (Phase 2) in the United Republic of Tanzania

Subj.: Recommendation for the Institutional Development of ZAWA

Dear Dr. Mustafa Ali Garu,

The water utility management expert of the captioned project had a series of discussion both internally and with the HR officer regarding the institutional development of ZAWA, and we have the following recommendations (refer to appendices 1 to 5):

1) Communication channel between the headquarters and the rural district offices (i.e. North A, North B, Central and South) needs to be reinforced in terms of technical, commercial and financial; along this line, a new director class needs to be established in charge of rural district offices;
2) The Mapping (GIS/GPS) Division needs to be integrated into the Computer Unit, to ensure the security, quality and update of the data, as well as the timely maintenance of hardware/software;
3) The Monitoring and Evaluation Unit and the Planning Division need to be merged under the direct control of the Director General;
4) A new post of Secretary General needs to be created to control thus expanded units in headquarters in support of the Director General;

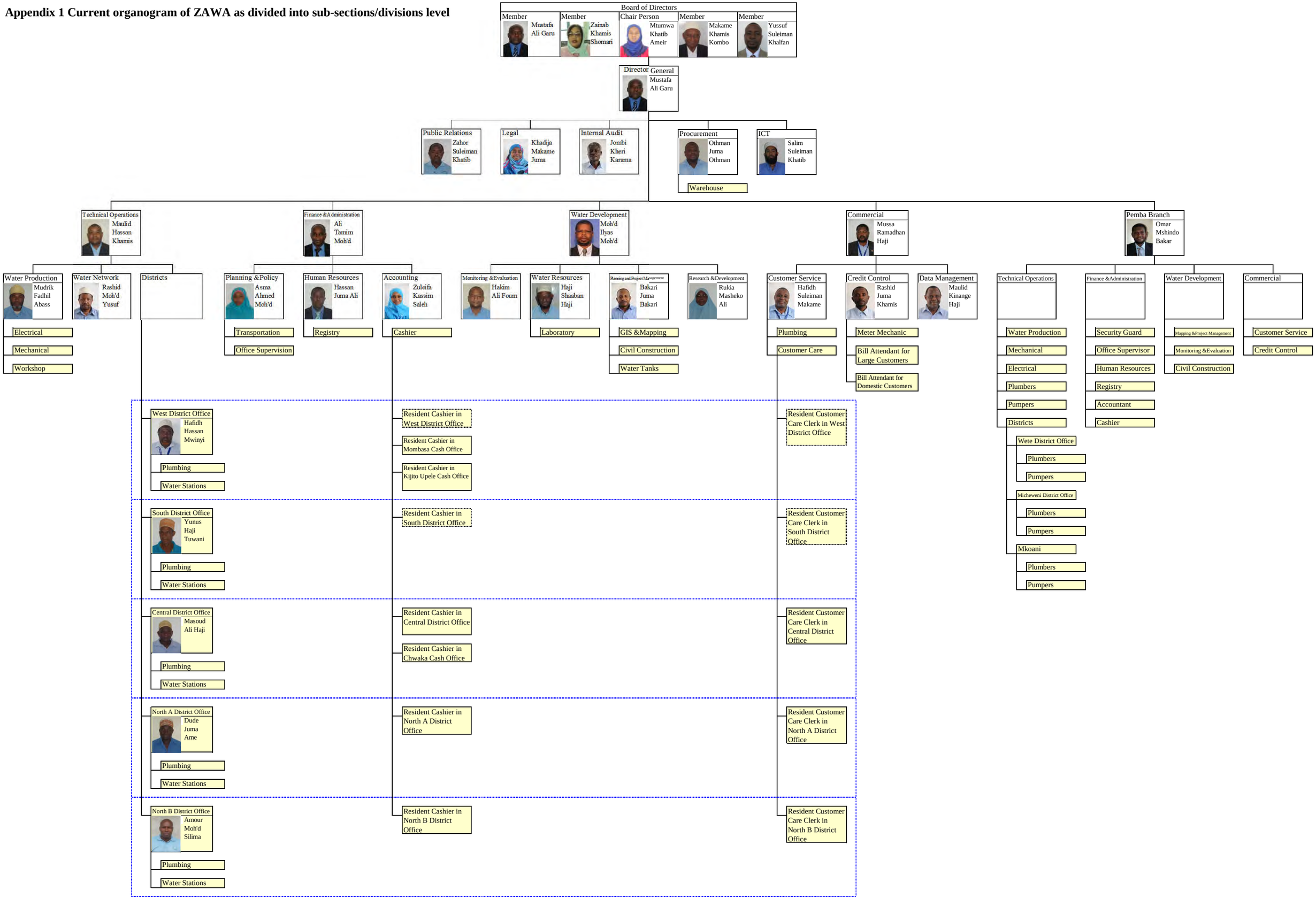
Your kind cooperation and prompt action on this matter would be greatly appreciated.

Yours faithfully,

Toshihiko Tamama

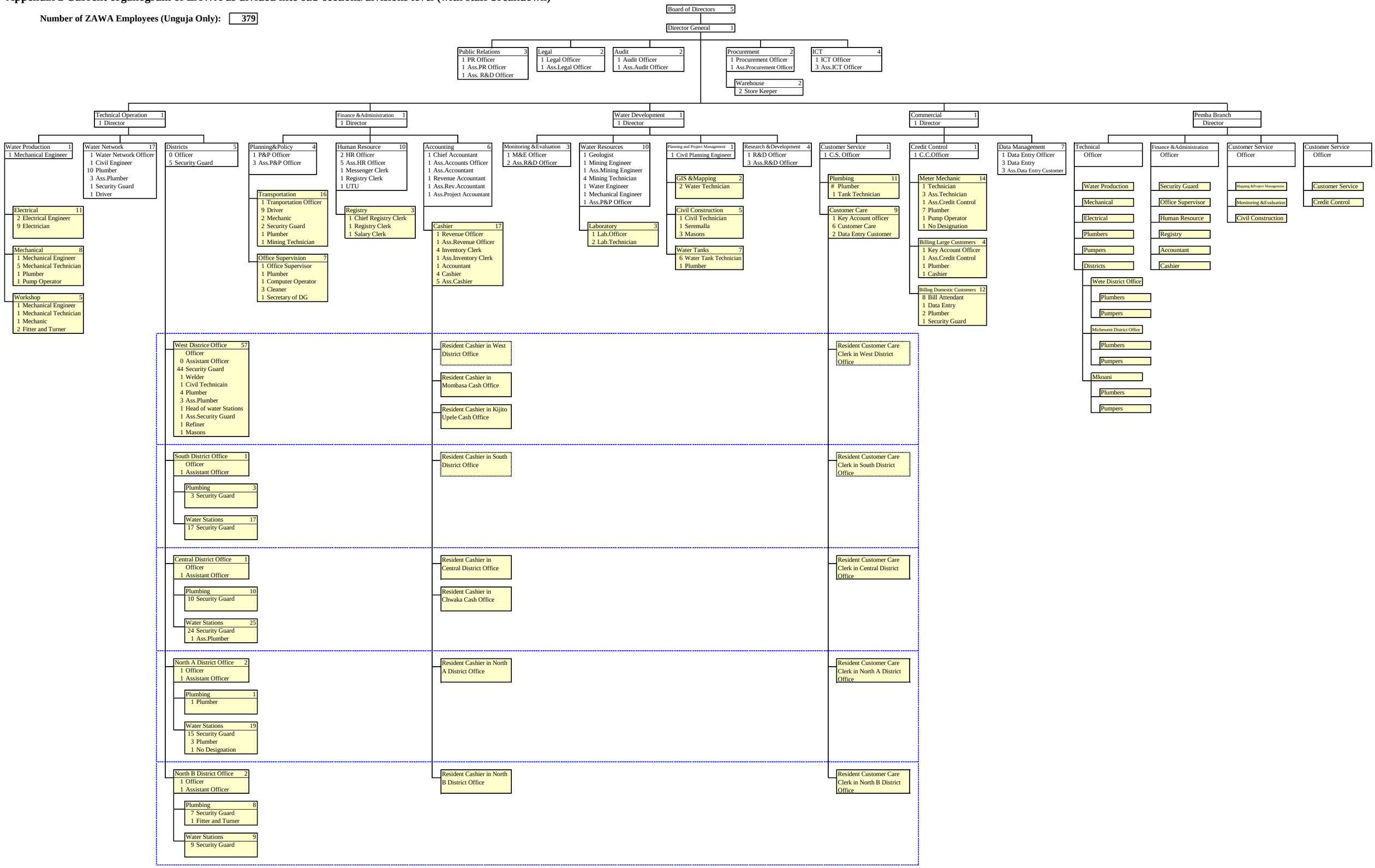
TAMAMA Toshihiko
Vice Chief Advisor and Water Utility Management Expert of the JICA Expert Team

Appendix 1 Current organogram of ZAWA as divided into sub-sections/divisions level



Appendix 2 Current organogram of ZAWA as divided into sub-sections/divisions level (with staff breakdown)

Number of ZAWA Employees (Unguja Only): 379



(4) Output-3: Draft Guideline of Simulation on the Proper Tariff

SIMULATION ON TARIFF LEVEL

WITH DUE CONSIDERATION

OF

USER ORIENTED

AND

WATER SUPPLY SERVICEIMPROVEMENT IN UWS

Edition_ver-1 (the First Draft): as ofApril-2015

The Technical Cooperation Project for

Enhancement of Water Supply Management of

Zanzibar Water Authority (Phase 2) in the United Republic of Tanzania

April 2015 as the First Draft

Joint Task Force Team

ZAWA Counterparts and JICA Experts

Table of Contents (Abstraction in JPN and Presentation on ENG)

List of Tables

Chapter- I Background

Prior to the introduction of the amendment to the Water Regulations of 2008, water for domestic consumption was provided for free. The said regulations introduced tariff structures to be applied in the billing of water consumption whereby domestic consumers are required to pay a flat rate of TZS 4,000 per month, hotels 4 – 5 star TZS 5million, 2-3 stars TZS. 3 million, restaurants, bakeries, building contractors, petrol stations, car washes and small scale industries ranged from TZS 20,000 p/m to TZS 120,000.

The charge currently in place does not commensurate to the ability of ZAWA to meet its financial obligations when fall due. Therefore, it is obvious that ZAWA's operation and maintenance costs have been subsidized by the government through allocation of its national budget to meet the utility monthly obligations.

Based on the brief background given above, it is apparent that ZAWA is not able to cover its operation and maintenance costs, let alone the investment costs, without support from the Government. This is evidenced by the support by the Government through electricity and other subsidies. The dependence of ZAWA on government subsidies is against the user pay principle whereby public services of which the users and volume of use are specified (such as water services) are operated by public corporations and costs of operating of such corporations are paid by the users through tariff.

Moreover, ZAWA dependence on government subsidies is contrary to the National Water Policy of the Revolutionary Government of Zanzibar which calls for water utilities to mainly be self-financing at least to meet operation and maintenance costs.

In due course of achieving the policy objective of self-financing of water supply operations costs, ZAWA has initiated a process to establish a model or methodology to estimate proper tariff level which will eventually recover operation, maintenance and short and long term investment costs from the water users.

(5) Output-3: Progress of the Service Connection Survey

Saateni Upper System:

ZAWA Water Supply			Shaurimoyo Shehia			Makadara Shehia			Mikunguni Shehia			Gulioni Shehia			Mlandege Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	288	173	756	812	534	0	24	87	2	239	110	0	124	199
		Flat	288			56			24			237			124		
	Non-entry	Public	26		83	1		0	0		49	0		22	2		0
		Illegal	667		862	44		105	278		218	181		322	236		64
Non-user	Water Sources		3	93		1	1		0	1		0	0		12	29	0
	Connect to Illegal Provider		90			0			1			0			17		0
	No Answer or Non-recipient		310		129	0		0	18		0	0		0	48		26
Total of HHs			1,384		1,247	858		639	321		354	420		454	439		289
Month of Surveyed			Sep-14			Aug-14			Sep-14			Jun-14			Jan-15		

Sub-total: DMA-1

758	Metered	User of ZAWA
729	Flat	
29	Public	
1,406	Illegal	
16	Water Sources	Non-user of ZAWA
108	Illegal Provider	
376	Non-recipient	
3,422	Sub-total in DMA-1	

Saateni Upper System:

ZAWA Water Supply			Mchangani Shehia			Vikotoni Shehia			Mwembeshauri Shehia			Kisiwadui Shehia			Kikuwajuni juu Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	169	79	0	63	0	0	3	0	0	65	0	0		0
		Flat	169			63		62	3		13	65		20	13		14
	Non-entry	Public	3	30	3	0	240	0	4	324	0	1		0	5		0
		Illegal	27		0	240		199	320		237	243		261	383		0
Non-user	Water Sources		126	171	128	9	22	0	0	8	3	0	2	2	3	3	0
	Connect to Illegal Provider		45			13		0	8		97	2		13	0		2
	No Answer or Non-recipient		0		89	60		144	17		0	20		0	36		0
Total of HHs			370		299	385		405	352		350	331		296	427		16
Month of Surveyed			Mar-14			Feb-15			Mar-15			Mar-15			May-15		

Sub-total: DMA-2

0	Metered	User of ZAWA
313	Flat	
13	Public	
1,213	Illegal	
138	Water Sources	Non-user of ZAWA
68	Illegal Provider	
133	Non-recipient	
1,878	Sub-total in DMA-2	

Saateni Upper System:

ZAWA Water Supply			Mkunazini Shehia			Malindi Shehia			Kiponda Shehia			Shangani Shehia			Rahaleo Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	26	0	0	101	0	0	4	0	0	21	2	0	46	0
		Flat	26		2	101		114	4		0	21			46		34
	Non-entry	Public	0	324	4	0		0	0		2	0		0	0		0
		Illegal	324		16	301		212	131		9	204		183	312		266
Non-user	Water Sources		3	283	15	1	51	0	10	113	46	27	287	5	4	11	0
	Connect to Illegal Provider		280		19	50		0	103		13	260		120	7		1
	No Answer or Non-recipient		55		139	54		214	6		60	44		7	26		117
Total of HHs			688		195	507		540	254		130	556		317	395		418
Month of Surveyed			Nov-16			Dec-14			Nov-14			Nov-14			Feb-15		

Sub-total: DMA-3

0	Metered	User of ZAWA
198	Flat	
0	Public	
1,272	Illegal	
45	Water Sources	Non-user of ZAWA
700	Illegal Provider	
185	Non-recipient	
2,400	Sub-total in DMA-3	

Saateni Upper System:

ZAWA Water Supply			Mwembetanga Shehia			Kikwajuni Bondeni Shehia			Kisima-Manjongoo Shehia			Miembeni Shehia			MwembeLadu Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	132	0	0	33	0	0	75	0	0	45	0	0	85	0
		Flat	132		117	33		35	75		29	45		20	85		59
	Non-entry	Public	1	367	0	0	378	36	3	435	0	1	794	0	1	314	0
		Illegal	366		416	378		245	432		212	793		83	313		277
Non-user	Water Sources		0	8	3	0	0	1	2	16	0	16	24	3	17	41	0
	Connect to Illegal Provider		8		17	0		44	14		1	8		1	24		0
	No Answer or Non-recipient		11		0	23		0	0		192	23		22	73		64
Total of HHs			518		553	434		361	526		434	886		129	513		400
Month of Surveyed			Mar-15			May-15			Apr-15			Jun-15			Jan-15		

Sub-total: DMA-4		
0	Metered	User of ZAWA
370	Flat	
6	Public	
2,282	Illegal	
35	Water Sources	Non-user of ZAWA
54	Illegal Provider	
130	Non-recipient	
2,877	Total in DMA-4	

Saateni Upper System:

ZAWA Water Supply			Kilimani Shehia			Kwaalimsha Shehia			Kwahani Shehia			Mkele Shehia			Mwembemakumbi Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	2	80	0	0	28	3	0	7	0	0	28	0		0	0
		Flat	78		33	28		74	7		59	28		56			83
	Non-entry	Public	66	164	15	5	153	21	14	228	10	11	241	282		0	694
		Illegal	98		112	148		136	214		192	230		132			14
Non-user	Not Connected		0		0	139		98	99		106	350		70			5
	Water Sources		20	163	16	5	131	7	6	234	42	10	343	122		0	10
	Connect to Illegal Provider		143		141	126		71	228		252	333		236			316
	No Answer or Non-recipient		232		148	45		87	110		68	82		61			100
Total of HHs			639		465	496		497	678		729	1,044		959	0		1,222
Month of Surveyed			Feb-16			Jun-16			Jun-16			Jul-16			On-going		

Sub-total: DMA-5		
2	Metered	User of ZAWA
141	Flat	
96	Public	
690	Illegal	
449	Not Connected	Non-user of ZAWA
41	Water Sources	
830	Illegal Provider	
469	Non-recipient	
2,718	Total in Saateni System	

Ratio of Utilization = 74%
(No. of HHs using ZAWA water) ÷ (No. of all HHs) × 100 (%)

Ratio of Connection = 73%
(No. of HHs connecting to ZAWA) ÷ (No. of all HHs) × 100 (%)

Ratio of Registration = 26%
(No. of HHs registering to Flat and Metered) ÷ (No. of HHs connecting to ZAWA) × 100 (%)

Total: ΣDMA(1-5)		
760	Metered	User of ZAWA
1,751	Flat	
144	Public	
6,863	Illegal	
	Not Connected	Non-user of ZAWA
275	Water Sources	
1,760	Illegal Provider	
1,293	Non-recipient	
12,846	Total in Saateni System	

Mpendae (Saateni Lower System):

ZAWA Water Supply			Mpendae Shehia			Urusi Shehia			Kwaalinatuu Shehia			Jang'ombe Shehia			Meya Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	165	0	0	88	0	0	5	0	0	2	0	0	51	0
		Flat	165		115	88		40	5		14	2		8	51		97
	Non-entry	Public	992		304	615		382	244		408	524		313	237		92
		Illegal	488		402	216		240	103		26	48		33	139		228
Non-user	Water Sources		78	144	354	9	117	5	31	204	24	18	292	10	12	300	64
	Connect to Illegal Provider		66		51	108		218	173		122	274		441	288		137
	No Answer or Non-recipient		26		118	16		50	58		22	142		89	135		82
Total of HHs			1,815		1,344	1,052		935	614		616	1,008		894	862		700
Month of Surveyed			Nov-15			Dec-15			Mar-16			Apr-16			May-16		

Sub-total: DMA-1

0	Metered	User of ZAWA
311	Flat	
2,612	Public	
994	Illegal	
148	Water Sources	Non-user of ZAWA
909	Illegal Provider	
377	Non-recipient	
5,351	Sub-total in DMA-1	

Mpendae (Saateni Lower System):

ZAWA Water Supply			Matarumbeta Shehia			Kidongo Chekundu Shehia			Muungano Shehia			Sebleni Shehia			Nyerere Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Flat	0		5												
	Non-entry	Public	49		2	0		0			0			0			0
		Illegal	198		25												
Non-user	Water Sources		9	124	9		0	0	0	0		0	0			0	0
	Connect to Illegal Provider		115		130			0									
	No Answer or Non-recipient		61		12						0			0			0
Total of HHs			432		183	0		0	0		0	0		0	0		0
Month of Surveyed			May-16														

Sub-total: DMA-2

0	Metered	User of ZAWA
0	Flat	
49	Public	
198	Illegal	
9	Water Sources	Non-user of ZAWA
115	Illegal Provider	
61	Non-recipient	
432	Sub-total in DMA-2	

Mpendae (Saateni Lower System):

ZAWA Water Supply			Magomeni Shehia			Sogea Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	0	0	0		0
		Flat						
	Non-entry	Public	0			0		0
		Illegal						
Non-user	Water Sources			0			0	0
	Connect to Illegal Provider							0
	No Answer or Non-recipient							
Total of HHs			0		0	0		0
Month of Surveyed								

Sub-total: DMA-3

0	Metered	User of ZAWA
0	Flat	
0	Public	
0	Illegal	
0	Water Sources	Non-user of ZAWA
0	Illegal Provider	
0	Non-recipient	
0	Sub-total in DMA-3	

Total: ΣDMA(1-3)

0	Metered	User of ZAWA
311	Flat	
2,661	Public	
1,192	Illegal	
157	Water Sources	Non-user of ZAWA
1,024	Illegal Provider	
438	Non-recipient	
5,783	Total in Saateni System	

Ratio of Utilization = (No. of HHs using ZAWA water) ÷ (No. of all HHs) × 100 (%)
72%

Ratio of Connection = (No. of HHs connecting to ZAWA) ÷ (No. of all HHs) × 100 (%)
26%

Ratio of Registration = (No. of HHs registering to Flat and Metered) ÷ (No. of HHs connecting to ZAWA) × 100 (%)
7%

Saateni System (Mnara Wa Mbao):

ZAWA Water Supply			Migombani Shehia		
Utilization	**Register**	**Subscriber**	**SC Survey**		**HH Survey**
User	Entry	Metered	0	238	0
		Flat	238		377
	Non-entry	Public	93		56
		Illegal	207		565
Non-user	Water Sources		7	323	11
	Connect to Illegal Provider		316		72
	No Answer or Non-recipient		105		93
Total of HHs			966		1,174
Month of Surveyed			Jan-15		

Sub-total: DMA-1

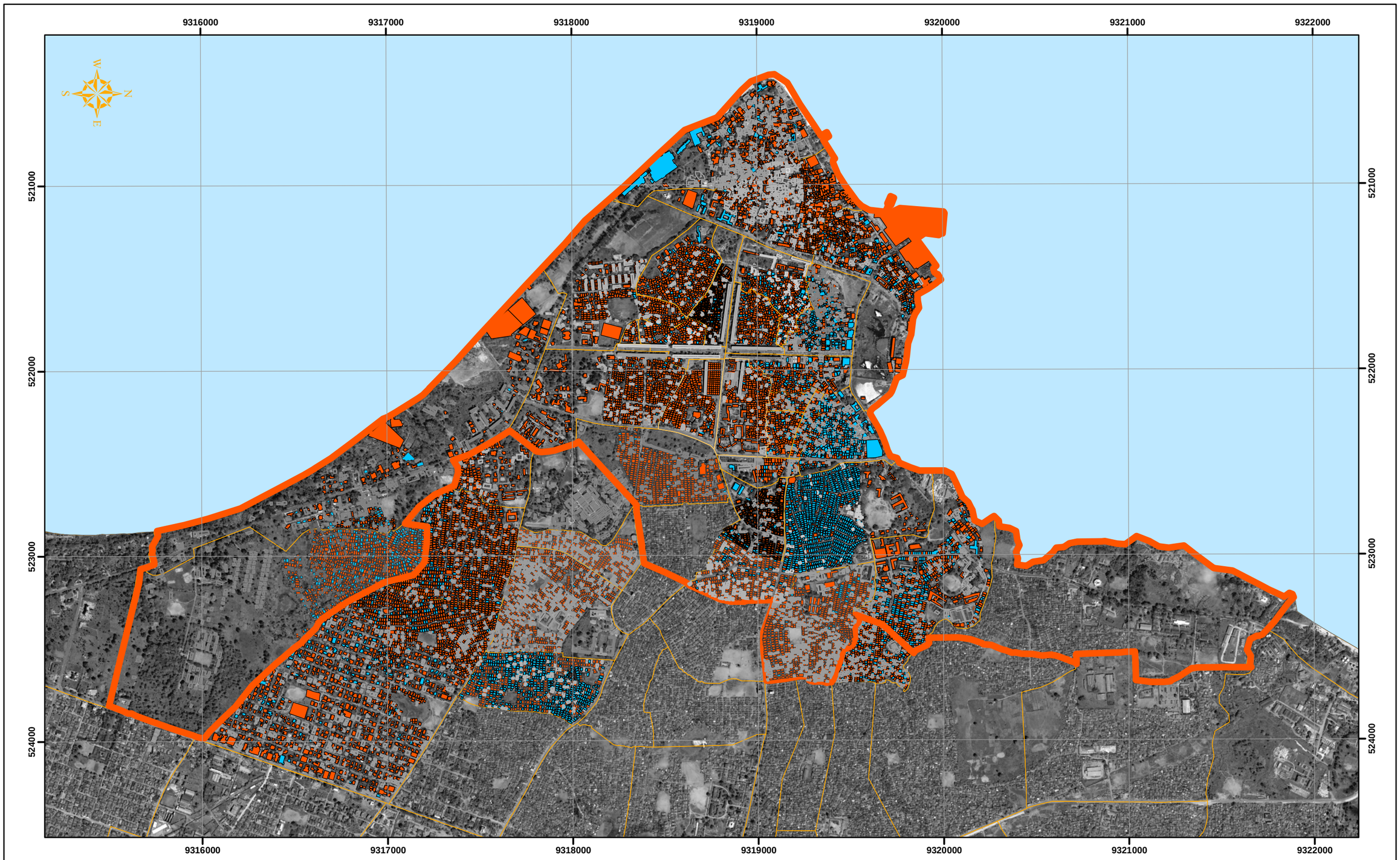
0	Metered	User of ZAWA
238	Flat	
93	Public	
207	Illegal	
7	Water Sources	Non-user of ZAWA
316	Illegal Provider	
105	Non-recipient	
966	Sub-total in DMA-1	

Ratio of Utilization = (No. of HHs using ZAWA water) ÷ (No. of all HHs) × 100 (%)
56%

Ratio of Connection = (No. of HHs connecting to ZAWA) ÷ (No. of all HHs) × 100 (%)
46%

Ratio of Registration = (No. of HHs registering to Flat and Metered) ÷ (No. of HHs connecting to ZAWA) × 100 (%)
44%

(6) Output-3: Map of Customer



PROJECT: THE PROJECT FOR ENHANCEMENT OF WATER SUPPLY MANAGEMENT OF ZANZIBAR WATER AUTHORITY PHASE 2	TITLE: **MAP OF SERVICE CONNECTION SURVEY**					SCALE: **1:20,000**
ZANZIBAR WATER AUTHORITY (ZAWA)	NJS CONSULTANTS CO,.LTD (NJS)	LEGEND: Connected with registration; Connected without registration; Not Connected; AfDB Project Area	DESIGNED BY: **ALI SAID MOHAMED**	DRAWN BY: **GIS UNIT**	CONFIRMED BY: **CCS DEPT.**	DATE: **SEP - 2016**	DRAWING NO. **VER - 01** GEOCODE:

(7) Output-3: Draft Guideline of Customer Promotion

Customer Management Guideline (Version 2.3)

24 September 2016

ZANZIBAR WATER AUTHORITY

P. O. Box 460
ZANZIBAR

Tel/Fax : +255 24 2231151
E-mail : zawa@zanzinet.com

P. O. Box 59, Chake Chake,
PEMBA

Tel/Fax : +255 24 2452652
E-mail : zawape@zanzinet.com

Table of Contents

Chapter 1 Introduction

This guideline in the tool used by ZAWA to ensure the responsibility of the concerned staff and that the flow of working procedure to customer is linked from customer identification, registration, data recording, billing to payment follow-up.

This version is designed to be applied to ZAWA head office in Unguja, but Pemba branch and district offices shall be included in the future revision.

(8) Output-3: Training Record on Trainer for Meter Reading

EVALUATION RECORDS

ON

CAPACITY DEVELOPMENT OF ZAWA COUNTERPARTS

(Training of Trainer for Meter Reading by Smart-phone)

Edition_ver-1: as of July-2016

The Technical Cooperation Project for
Enhancement of Water Supply Management of
Zanzibar Water Authority (Phase 2) in the United Republic of Tanzania

July 2016

Joint Task Force Team
ZAWA Counterparts and JICA Experts

(9) Output-4: Training Record on Leakage Detection

EVALUATION RECORDS

ON

CAPACITY DEVELOPMENT OF ZAWA COUNTERPARTS

(Works on Leakage Detection)

Edition_ver-1 (the First Stage): as of April-2015

The Technical Cooperation Project for
Enhancement of Water Supply Management of
Zanzibar Water Authority (Phase 2) in the United Republic of Tanzania

September 2015 as the First Stage

Joint Task Force Team
ZAWA Counterparts and JICA Experts

(10) Output-4: Training Record on Construction Supervision

EVALUATION RECORDS

ON

CAPACITY DEVELOPMENT OF ZAWA COUNTERPARTS

(Works on Piping/ Civil and Quality Control)

Edition_ver-1 (the First Stage): as of August-2016

The Technical Cooperation Project for
Enhancement of Water Supply Management of
Zanzibar Water Authority (Phase 2) in the United Republic of Tanzania

August 2016

Joint Task Force Team
ZAWA Counterparts and JICA Experts

(11) Output-4: Training Record on GIS Operation

EVALUATION RECORDS

ON

CAPACITY DEVELOPMENT OF ZAWA COUNTERPARTS

(Works on G.I.S Operation)

Edition_ver-1 as of August -2016

The Technical Cooperation Project for
Enhancement of Water Supply Management of
Zanzibar Water Authority (Phase 2) in the United Republic of Tanzania

August 2016

Joint Task Force Team
ZAWA Counterparts and JICA Experts

(12) Output-4: Technical Standards

Zanzibar Water Authority

ZAWA Technical Standards

Constitution of ZAWA Technical Standards

Reference Number	Document Name	Revision History
ZAWA-STD-001	General Statement	
ZAWA-STD-002	Water Resources	
ZAWA-STD-003	Reservoirs and Elevated Tanks	
ZAWA-STD-004	Disinfection Equipment	
ZAWA-STD-005-01	Installation of pipeline for urban Water supply	
ZAWA-STD-005-02	Installation of Pipeline for rural water supply	
ZAWA-STD-006	Service Connection	
ZAWA-STD-007	Monitoring Equipment	

ZAWA-STD-005-01
March 2015

Zanzibar Water Authority

ZAWA Technical Standards

for

Installation of Pipeline

for Urban Water Supply

ZAWA Technical StandardforInstallation of Water Pipeline (ZAWA-STD-001)

Table of Contents

ZAWA-STD-006
March 2015

Zanzibar Water Authority

ZAWA Technical Standards

for

Service Connection

ZAWA Technical Standard for Service Connection
(ZAWA-STD-002)

Table of Contents