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PUBLISHER

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REPOSITORY RECORD

Mihayo, Zephania, and Cyrus Njiru. 2019. "Improving Utility Management : Case Study of MWAUWASA, Tanzania". figshare. <https://hdl.handle.net/2134/2118>.

MAXIMIZING THE BENEFITS FROM WATER AND ENVIRONMENTAL SANITATION

**Improving utility management:
Case study of MWAUWASA, Tanzania**

Eng. Zephania Mihayo (MWAUWASA, Tanzania) and Dr. Cyrus Njiru (WEDC, UK)

Mwanza Urban Water and Sewerage Authority (MWAUWASA) has been encountering a lot of challenges, which includes inter alia, the still high UfW, great outstanding balances by debtors, high power costs, underdeveloped management system and low sewerage network coverage. This led to the need to improve utility management and thus the urge of the organisation to participate in the Water Utility Management & UfW project. One of the issues addressed is the developing of Performance Improvement Plan (PIP) to guide the organisation in its performance including reduction in UfW. This required the organisation to address the four key questions: where are we now, how did we get here, where do we want to go, how might we get there, and how do we ensure success. The newly established District Meter Areas (DMAs) is one of the effective strategies of reducing unaccounted for water (UfW) through Measurement-Validation-Identification-Rectification cycle. The project has indeed left MWAUWASA with the in-house capacity for long-term planning for further development and sustainability.

Background Information

Mwanza Urban Water and Sewerage Organisation (MWAUWASA) is a Government Agency established in July 1996 as a semi-autonomous organisation under the Water Works Ordinance. It was declared fully autonomous from January 1998. It is solely owned by the Government of Tanzania and managed under the Executive Board of Directors appointed by the Minister responsible for Water Affairs in Tanzania.

The Organisation has the mandate and mission “to provide reliable, adequate and sustainable safe water and sewerage services in an environmentally friendly manner to Mwanza City at affordable and cost effective tariffs”. This is in realization of its vision of becoming “a model in the provision of safe water and sewerage services in Tanzania” by year 2008.

As an executive agency of the government, MWAUWASA was established to fulfil the following main objectives:

- Ensure consumers get a sustainable, continuous supply of adequate water that meets WHO guidelines.
- Ensure wastewater is treated to meet Tanzanian effluent standards before disposal into a receiving water body.
- Plan, design and execute new water and sewerage projects.
- Develop and carryout proper maintenance of all infrastructures connected with water supply and sewerage services.
- Promote conservation and proper use of water resource.
- Raise revenue from the service provided for cost optimisation and sustainability.

Since its establishment in 1996, MWAUWASA has achieved a considerable level of improvements. Some of the major achievements are shown in the key performance indicators summarized in Table 1:

Table 1 Key Performance Indicators, 1996/1997 – 2003/2004

Item	1996/97	2002/03	2003/04
Water Produced/yr (000'm ³)		14,279	14,337
UfW	76%	57%	50%
Water supply Area coverage		70%	72%
Customer base (number of connections)	8,000	14,515	16,303
Metered connections (%)	1%	76%	89%
Av. water supply hours/day	12	20	22
Sewerage service area coverage	-	7%	7%
Staff per 1000 connections	20	14	12
Operating ratio		0.85	0.96
Days receivable ratio	>300	206	180
Revenue Collection efficiency	-	94 %	95 %
Average monthly revenue collection (in 000' of TShs)	18,000	200,000	220,000
Internally funded capital investments (in 000' of TShs)	63,000	327,000	513,000

Other key achievements/aspects of MWAUWASA include:

- The sewerage network and disposal system that had stopped functioning for some years has been revived.
- Computerisation of the billing, finance and human resources functions.
- Water network length was extended from about 100km to 210km and water distribution improved.

- Sewerage network was extended to a length of 24 km.
- The organization was restructured by establishing posts and employing professionals in key disciplines such as business, finance, administration, public relations, legal and engineering.

Purpose and scope of the utility management improvement project

The project to improve water utility management at MWAUWASA took a participatory approach whereby the project team (consultants) facilitated the processes and the participants produced the project outputs in terms of Performance Improvement Plans (PIPs) and UfW pilot area plans. The purpose was to improve the performance of water and sewerage utilities by improved management thereby allowing expansion of services to peri-urban areas.

Performance Improvement Plan (PIP)

A performance improvement plan (PIP) is a comprehensive work-plan developed to address a variety of management issues in a utility, with the intention of enabling the utility to achieve the objectives of its mandate and mission. It is therefore, an important tool for utility managers in effective and efficient water utility management.

MWAUWASA developed her PIP for year 2004 to 2008 in financial year 2003/2004 and started its implementation in financial year 2004/2005. Even at this early stage of implementation, the PIP has brought a considerable change in the culture and attitude of performance of the organisation. Much more in the performance and service delivery of the organisation is expected as implementation goes on.

The process of developing the PIP involved the following stages:

1. Institutional Analysis.
2. Training for developing the PIP
3. Preparation of Draft PIP
4. Review of Draft PIP
5. Finalisation of PIP document
6. Dissemination of the PIP to stakeholders.

Institutional Analysis

This was an important starting point where the top managers, middle managers and other selected staff, by the facilitation of the project team, undertook an analysis of strengths, weaknesses, opportunities and threats (SWOT) of MWAUWASA, to determine the current situation of the organisation. Furthermore, a preliminary analysis and formulation of objectives of the organization, plans and strategies for improvement was done. All these were discussed with stakeholders in a participatory way to solicit in-house consensus on the issues.

Training for developing the PIP

Five Managers from MWAUWASA attended a two week intensive training course at the Umgeni Training Centre, Durban S.A facilitated by the consultants from the Water,

Engineering & Development Centre (WEDC) and Severn Trent Water International. Other participating utilities were NWSC Entebbe- Uganda, KIWASCO- Kenya and WASA Lesotho. The training covered key aspects of water and sewerage services utility management, necessary for developing and implementing comprehensive PIPs and action plans for UfW in the utilities. The aspects included the following:

- Institutional analysis and development
- Commercialisation and customer services
- Financial management
- Management of human resources
- Operations and maintenance
- Management of UfW
- Contracting out utility activities and private sector participation.
- Planning and development of PIPs
- Change management.

This enabled participants to prepare effective PIPs and action plans for UfW for the utilities based on good practices in commercial and customer oriented water utility management, and through shared learning and experiences.

Preparation of draft PIP

The preparation of the MWAUWASA PIP involved the following stages:

- Situation analysis of the organisation
- Strategies employed so far (how did we get there)
- Development of Vision, Mission, Objectives and Targets to be achieved
- Strategies to be implemented, and
- Monitoring and evaluation.

Situation analysis:

In the situation analysis, the organisation undertook performance audit against key performance indicators as agreed in the memorandum of understanding between MWAUWASA and the Ministry of water. Another aspect undertaken was the SWOT analysis and identified actions to reduce the weaknesses and capitalize on the opportunities identified by the analysis. Furthermore, political, environmental, social and technical (PEST) analysis of the organization was undertaken.

Strategies employed:

Analysis of strategies employed for the organisation to be there to determine the effectiveness and efficiency during implementation. This was important so the organisation could take what was good and leave what was bad.

Vision, Mission, Objectives and Targets:

The management agreed on a Vision and Mission of the Organisation and then developed and clarified objectives in line with the Vision and Mission and derived from the Organisation's mandate and obligations.

To realize these objectives, by help of a financial plan-

ning model developed during the training, the organisation developed and agreed on performance standards and targets that are Specific, Measurable, Achievable, Realistic and Time bound (SMART). Table 2 below shows some of the key targets to be achieved:

Table 2 Key Performance Targets/Indicators for the next 3 years of implementing the PIP

INDICATOR/RATIO	2005/6	2006/7	2007/8
Water Produced/yr (000m ³)	14,280	14,280	21,080
UfW	40%	35%	30%
Water supply Area coverage	82%	84%	90%
Customer base (# of connections)	21,340	24,200	27,400
Meters in working order	97%	98%	99%
Average supply hours per day	21	23	24
Sewerage service area coverage	8.5	9%	12%
Staff per 1000 connections	10	9	8
Operating ratio	0.8	0.75	0.7
Days receivable ratio	120	90	60
Revenue Collection efficiency	97 %	98 %	98 %
People/house connection	22	20	18
% Of population served	80 %	81.5 %	82 %

Strategies to be implemented

The organisation assessed itself against a number of critical success factors that contribute to effective and efficient utility management and addressed each of them as below:

- The management agreed upon and developed a new management structure, which is more commercially oriented, aimed at bringing roles and responsibilities to the right units and/or posts. This is intended to enable effective delegation of responsibility, authority and resources as well as accountability.
- Strategies have been developed to address reduction of UfW. Essentially covering the following key aspects: active leakage control, speed and quality of repairs, pressure management, metering and meter management, pipeline and asset management, and UfW record management.
- The management agreed, developed and implemented a customer services strategy, that include: customer identification & management; targeting & serving the customers by increasing water production and water & sewerage service coverage, improving water & effluent quality, and giving preferential services; and linking customer database with other management databases.
- A comprehensive human resources strategy was developed and is being implemented. It addresses policies, procedures and plans on staff motivation, pay schemes, training, performance management, working environment improvement, and seeks to empower employees to release their full potential for the benefit of MWAUWASA.

- The existing Management Information System (MIS) was reviewed in light of objectives and targets set. A proposed MIS addresses the issue of integrating financial, human resources, GIS and customer databases so as to enable the organisation to effectively communicate internally and externally.
- Operation and maintenance has been dealt with by a preventive and planned maintenance system for plants, networks and other capital and office equipments, with a commitment to prior and bulk purchasing.
- Financial management strategy was developed to include interventions for turnover increase, revenue increase, debt management, and operating cost reduction. It involves the issue of tariff setting to ensure cost recovery and affordability by using structures that bring cross-subsidy, budgeting and budgetary control.
- Capital investment programmes have been developed to include reviewing of existing assets, especially the infrastructures, and embark upon replacing those in poor condition. It also includes continuing soliciting external funding for major projects.

Monitoring and Evaluation

This will be facilitated by the use of SMART targets and performance contracts. Monitoring will enable the organisation to review progress and to propose actions to be taken in order to achieve the set objectives in the sense that it will identify actual or potential success and failures as early as possible and facilitate timely adjustments.

In evaluation, there will be an annual audit, review, and objective assessment of the design, plan, implementation and outcome of all ongoing or completed interventions in order to:

- Improve planning and implementation,
- Improve future policies and intervention through feedback and lessons learnt
- Review and re-set objectives and targets if necessary
- Provide bases for accountability, including provision of information to the public.

Review of Draft PIP

The draft PIP was reviewed in two ways:

1. A team of managers was assigned to work with experts from WEDC & Severn Trent and jointly visit the organisation to review the draft to ensure all important aspects and methodologies were taken on board.
2. A one-week seminar was held where the organisation presented the draft for peer review, discussion, comments and recommendations by the participating and invited water and sewerage utility managers.

Finalisation of PIP document

Finalisation of the PIP was done by incorporating recommendations that arose from the review. This also involved the process of getting the document accepted by key stakeholders and authorized by relevant bodies before formal implementation.

Pilot Area Action Plan for Reduction of UfW

The internationally accepted strategy to reduce UfW is that of M-V-I-R, i.e.: Measurement of flows (supply & demand); Validation of readings; Identification of the problem (leaks, commercial losses); and, Rectification (repair of leaks, corrected billing database). The most effective way to implement this strategy is to establish District Meter Areas (DMAs) and in this light the organisation established a pilot DMA in Mahina area that is part of Mkuyuni water distribution zone.

In setting this pilot area the following were involved:

1. In consultation with the experts this pilot area was identified based on easy isolation from the distribution system, it has a representative number of all customer categories, does not require boundary valves and only one meter is required to monitor flows into the area.
2. Analysis of the existing data on the area and its customers was made to determine water demand and pressure in the area. This was augmented by field tests.
3. Collation of data on the area characteristics including: number of properties, number of people per connection, any illegal connections, monitoring billing information, mains record verification, replacing/repairing all known faulty/stopped meters, and night demand data.
4. Calculation of the required meter size to measure inflows.
5. Installation of the meter and consumption meters to all connections in the area.
6. Updating network plans including by extending distribution lines and replacing some old pipes.
7. Recording the DMA data including: meter type & number, pipe work drawings, vulnerable customers, key customers and check meter points.
8. Commissioning the DMA

This completed the process of setting up the pilot DMA. However, the DMAs have to be managed properly for give better and desired results. Below are outlined further action plans taken in the management of DMAs:

- Establishing more DMAs. So far 14 DMAs have been established in all 4 water distribution zones.
- Daily reading of inflow measuring meters and consumption meters and then calculating mass-balance and respective UfW.
- Effective and timely locating, repairing leaks and eliminating illegal use
- Monitoring and re-measuring, which involves continuous recording of flows into DMAs and consumption, and verification of data.
- Managing records of the DMAs which includes: updating data, ie new connections; recording of time, materials & equipments used for leaks, illegal use detecting activities and for the evaluated costs incurred; recording of time, materials & equipments used for repairing leaks and legitimising or disconnecting illegal use and the evaluated costs incurred;

- Undertaking an annual review to assess the effectiveness of the strategy including elements such as progress against targets, change of targets due to lessons learnt and investment made.

Results of intervention

The performance improvement project undertaken by MWAUWASA has resulted into the organisation producing a comprehensive Performance Improvement Plan (PIP) of which the first phase is of 4 years (2004/2005 – 2007/2008). Furthermore the skills and knowledge gained has built an in-house capacity in preparation and implementation of the current and future PIPs.

The project resulted in the development of a financial model plan that has proved to be a very important tool in carrying out situational analysis of the organisation, setting and shaping SMART targets, and analysing the financial implications of strategies and thus allowing timely adjustments. The project, as it involves utilities with varying levels of development, set out for constructive benchmarking among the utilities themselves

The implementation concept of the DMA as an effective tool in UfW reduction strategy has even at this early stages shown significant gains in the organisation.

Conclusions

The performance improvement project came at the time when MWAUWASA was in transition to a full autonomous entity and changes were necessary. The project was greatly influential in these changes especially the concepts that came with it such as DMAs for UfW reduction. Furthermore, it has left MWAUWASA with the in-house capacity for long-term (strategic) planning for further development and sustainability. One of the lessons learnt is that any utility cannot do the right things without planning into the future, i.e. having a roadmap towards its vision of the future. The PIP has underscored this.

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Contact address

Eng. Zephania Mihayo, Managing Director, Mwanza Urban Water & Sewerage Authority (MWAUWASA), P.O. Box 317, Mwanza, Tanzania.

Dr (Eng.) Cyrus Njiru, Research Manager, WEDC, Institute of Development Engineering, Loughborough University, LE 11 3TU, Leicestershire, UK