Water conservation & water demand management in the Olifants Catchment

A pilot project

10/06/2015

USAID: RESILIENCE IN THE LIMPOPO BASIN PROGRAM (RESILIM) – OLIFANTS

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Project Area Identification

Maruleng and Ba-Phalaborwa municipalities are situated in the Olifants catchment area. After Emalahleni local municipality, Ba-Phalaborwa local municipality was identified as the second largest urban water user with the highest per capita consumption in the Olifants River catchment. Maruleng and Ba-Phalaborwa local municipalities have no WCWDM programmes while their water losses and non-revenue water were estimated to be in excess of 50% and it is unlikely that water services could be sustained unless urgent WCWDM interventions are undertaken.

It is for these reasons that AWARD identified Maruleng and Ba-Phalaborwa local municipalities as the ideal municipalities to target for the implementation of capacity development for water demand and water conservation management.

Project Objectives

The objectives of the project were as follows:

- Development of a WCWDM strategy and business plan for Maruleng and Ba-Phalaborwa local municipalities.
- Detailed analysis to:
  - Identify and quantify water loss contributing factors.
  - Identify potential interventions, budgets and timelines.
  - Prepare business plan to unlock funding for implementation.
- Focus on the enhancement of long-term water security and protection, climate change adaptation and catchment resilience through the reduction of water losses, non-revenue water and the improvement of water use efficiency
- Training and capacity building through social learning and systems thinking.

Legal Requirements

The development and implementation of a WCWDM strategy is a legal requirement and critical in terms of water security and achieving national strategic objectives. The WCWDM strategy should be aligned to the following documents:

- National Development Plan which requires clear targets for 2017 and 2022.
- National Water resource Strategy (NWRS2) which requires implementation of the reconciliation and all town strategies.
- Every Water Services Development Plan (WSDP) must contain details of existing and proposed water conservation, recycling and environmental protection measures.
- Regulations R 509 - Compulsory national standards and measures to conserve water states that a water services audit must be undertaken as a component in the WSDP and include details on WCWDM activities undertaken.
- The No Drop incentive based regulation requires the development of a WCWDM strategy and business plan.

Skills Gap Assessment, Training and Capacity Building

Skills gap assessments were done in Maruleng and Ba-Phalaborwa Local municipality. Technical services and financial department organograms were used to determine the availability of skills and capacity to successfully implemented WCWDM within municipalities. Assessments indicated that both municipalities have a large number of vacancies and limited capacity to implement WCWDM.

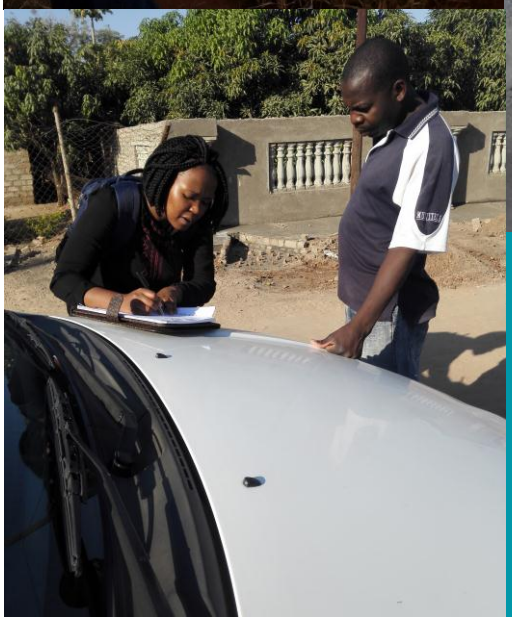
A two-day effective water supply management master class registered with SAICE and carrying 2 CPD points was presented to the technical staff. The target audience included technical staff from Lepelle Northern Water, Department of Public Works, Maruleng and Ba-Phalaborwa LM. AWARD staff were also present. The master class training covered burst and background analysis, interpretation of logging results, pressure management, background to WCWDM in SA, night flow analysis, operations, maintenance and No Drop.

Delegates were evaluated during and after the training and presented with certificates of competence or attendance.

The team ensured that training and capacity building were effectively implemented to empower staff from various municipalities sectors. Skills and knowledge were continuously transferred through training sessions, feedback sessions, hands-on training, presentations and communication between the team and stakeholders.

Knowledge, Attitude and Perception Survey

Knowledge, Attitude and Perception Surveys were conducted in MLM and BPLM to identify potential interventions to improve efficiency, identify municipal perception and service delivery and more importantly to understand water resource knowledge, value of water and water use patterns by the community.



35 questions were structured to form a questionnaire that was prepared, approved by AWARD and utilised when interviewing community members. A total of 60 households were surveyed from 12-15 June 2017, 19-23 June 2017 and 28-31 August 2017.

Multiple meetings and interviews were held with public practitioner, ward councillors, traditional authorities, ward committee members and community members

KAP surveys were structured to achieve community's perspectives and responses regarding water conservation knowledge, water quality and quantity, biographical information, metering and billing, service delivery perception, water sources and consumer charter knowledge. Details and results of KAP surveys have been submitted to AWARD and all municipalities, photographic records of KAP surveys are included in figures below.

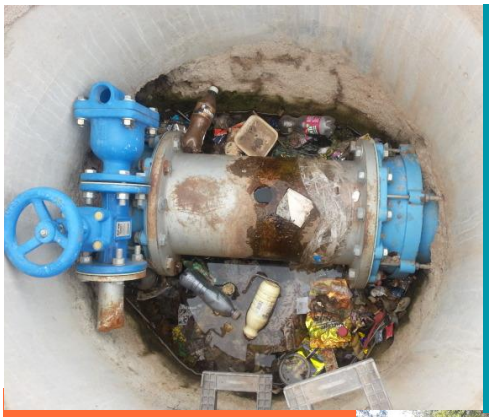
Schools Audit and Awareness Campaign

Schools audit and awareness campaigns were conducted in Maruleng and Ba-Phalaborwa LM. A total of six schools were visited for the campaign. Schools that were visited are:

- Rethusitswe Primary School
- Southern Cross Private School
- Hoedspruit High School
- Gaza Primary School
- Relebogile Primary School
- Refilwe primary School

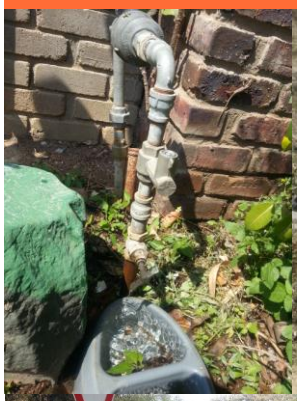
Education and awareness material distributed included 3 000 pens and pencils and 5000 brochures. Activities undertaken during the campaign included engaging school staff and principals on WCWDM issues and addressing pupils on water saving tips and water conservation.

Field Investigations

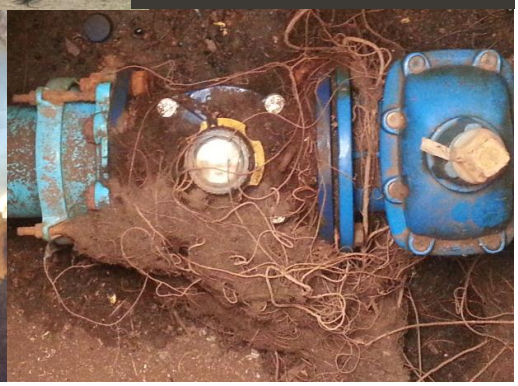


Field investigations were undertaken in each municipality to validate the information collected during the desktop study task. Bulk meters were investigated to understand their conditions and confirm if they were loggable.

The project focused on the Phalaborwa-Namakgale-Lulekani cluster since 95% of the population resides in this area. The area is supplied by Lepelle Northern Water from the Phalaborwa water treatment plant and water is abstracted from the Olifants River Barrage.



In Maruleng The team targeted Hoedspruit-Kampersrus cluster and Mametja-Sekororo RWS cluster. The study focus was on the Hoedspruit-Kampersrus cluster since there was water deficiency in Mametja Sekororo RWS cluster.



Pressure and Flow Logging

Pressure and flow loggings were undertaken to have an understanding of the water supply to each zone. The logging results were downloaded onto ZEDNET on a daily basis and shared with Maruleng, Ba-Phalaborwa, Lepelle Northern Water and AWARD. ZEDNET is the project team's propriety data acquisition and display software. The minimum night flow was analysed, using SANFLOW software developed by the WRC, to assess the physical leakage. A total of 43 pressure and flow logging was undertaken in Maruleng and Ba-Phalaborwa Local Municipality.

Critical Risk Factors

Several potential risks were identified and must be managed to ensure the successful implementation of the WCWDM strategy.

These risks include:

- Perceived to reduce revenue collection: It is perceived that a reduction in water demand by consumers will reduce the income to the municipality, however most WCWDM initiatives are targeted at reducing NRW and thereby increasing income.
- Perceived as an impairment to social and economic development:The perception is that WCWDM will have a negative impact on financial and economic considerations and changes in tariff structure will lead to increased cost of water and put a further strain on domestic consumers and businesses.
- Inadequate political will to support WCWDM: Lack of political support will hinder and delay the implementation of the strategy. This fact attests to perhaps a lack of understanding of the importance and value in implementing these measures.
- Insufficient budget:WCWDM is an ongoing process and cannot be concluded in one year. Lack of funding for WCWDM in the end will hinder the success of any WCWDM measure. It is important that WCWDM be included in the Integrated Development Plan (IDP). If well budgeted for and properly implemented, most WCWDM initiatives have a payback period of 2 to 3 years and these funds could be used to further and sustain WCWDM.
- Lack of co-ordination between Mopani district municipality and both Maruleng and Ba-Phalaborwa Local municipalities: Disparity between the District Municipality and Local Municipalities has been identified and must be improved to aid the implementation of WCWDM within local municipalities.

Project Findings and Key Analysis

- Approximately 39% of consumers in Ba-Phalaborwa are metered and billed. The remaining 61% receives water at no cost which leads to excessive leakage and wastage to the detriment of service delivery and sustainability of the municipality
- Water loss key performance indicators for Ba-Phalaborwa indicates high water losses (37.7%), non-revenue water (61.0%) and inefficient water use (388 ℓ/c/d)
- Water loss key performance indicators for Maruleng indicates high water losses 44%, high non-revenue water 46.8% and inefficient water use (762ℓ/c/d)
- A total of 88 or 18% of accounts have a zero consumption and the average consumption is very high at 84 kℓ/household/month in Maruleng
- 7 consumers use in excess of a 1000 kℓ per month. Emphasis should be placed on the top consumers as (5%) consumers uses 349 961 kℓ/month (50%) of the total water billed in Mruleng

- There are a large number of visible leaks as a result of deteriorating infrastructure and lack of maintenance
- Ba-Phalaborwa Flow and pressure logging profiles are erratic and highlights the excessive leakages in the system with resultant throttling of reservoir outflows to pressurise the system and poor service delivery
- A total of 3699 or 22% of accounts have a zero consumption and the average consumption in Phalaborwa town is very high at 65 kℓ/household/month
- 35 consumers use in excess of a 1000 kℓ per month. Emphasis should be placed on the top consumers as 804 (5%) consumers uses 349 961 kℓ/month (50%) of the total water billed in Ba-Phalaborwa
- There is scope for community awareness and training
- Water tariffs are very low and do not promote water use efficiency
- All key performance indicators for Ba-Phalaborwa indicate high water losses, NRW and inefficiency. The municipality should target 250 ℓ/c/d and NRW of 35% in line with national averages (DWS - No Drop reports, 2015). These targets should be achievable with the current infrastructure and capacity. The results indicate that if the system input could be reduced by 35% and billed consumption increased by 35%, without reducing the industrial billed consumption, the non-revenue water would reduce to 24% and the litres per capita per day to 252.
- The municipality stands to gain R 62.3 million per annum if the system input could be reduced by 35% and billed consumption increased by 35%
- Potential savings will contribute to enhancement of long-term water security and protection, climate change adaptation and catchment resilience
- Water conservation and awareness campaigns are required in all areas to address water wastage and improve efficiency
- Maintain billing and payment performance with respect to correctness of accounts, regularity of accounts received and sufficiency of information to understand municipal bills
- A large proportion of some residential areas do not have water meters. Should the Municipality install meters in future, there would be a need to educate the residents on how to read their meters, understand their water consumption and interpret their water bill. This would promote water use efficiency and the culture of paying for water services. If residents pay for their water consumption it would encourage them to use it more sparingly and wisely and to be more aware of the importance of water conservation.
- Municipalities to improve timelines of responding to enquiries/complaints
- A 62% reduction in system input volume and a 40% increased billed consumption would reduce non-revenue water down to 15% and litres per capita per day to 289 and increase revenue by R4.77 million per annum for Maruleng Local municipality. Potential savings will contribute to enhancement of long-term water security and protection, climate change adaptation and catchment resilience
- Results from the KAP surveys have highlighted the magnitude of the water crises problems affecting the Municipality and its community members. It is clear that Maruleng Local Municipality faces challenges regarding access to water and provision of good quality water that it perceived safe to drink by consumers.

Way forward

WCWDM interventions will lead to a more sustainable and reliable water supply. It offers a great opportunity to create sustainable employment opportunities. It can eliminate the need for intermittent supply, which leads to major infrastructure problems and water quality issues. In addition, it creates significant financial savings by postponing capital infrastructure projects and can reduce wastewater pumping cost and capacity problems in wastewater treatment plants.

Based on the findings of the urban domestic water sector assessment detailed, it is clear that there is significant scope for WCWDM in municipalities, which will result in both a reduction of non-revenue water and the total system input volume.

This AWARD initiative through the developed WCWDM strategy and business plans of the Local Municipalities, has offered Municipalities an opportunity to positively contribute towards the protection of the Olifants river catchment, improve Maruleng and Ba-Phalaborwa municipal services, and most importantly contibute towards themes of climate change adaptation, biodiversity (terrestrial and aquatic), natural resources management, and on livelihoods, especially of the poor and the vulnerable.

About USAID: RESILIM

USAID's Resilience in the Limpopo River Basin (RESILIM) program addresses ongoing degradation in the Limpopo River Basin in southern Africa, where people face water shortages, increased floods, and declines in crop productivity as climate change further stresses an already water limited region. There are two components to the program; one operating at a basin-scale (RESILIM-B, which is implemented by USA-based organisation called Chemonics and addresses similar issues at the scale of the four SADC member states that share the Limpopo Basin (South Africa, Botswana, Zimbabwe and Mozambique) and a catchment-scale project (RESILIM-O) that It is being implemented by the Association for Water and Rural Development (AWARD). Both projects share the same overall objectives.

You can find out more information on the RESILIM projects on www.usaid.gov and www.award.org.za. The USAID's RESILIM-O focuses on the Olifants catchment. The program aims to reduce the vulnerability of people and ecosystems in the Olifants Catchment specifically, by improving how transboundary natural resources are managed. By understanding the systemic causes of vulnerability, including climate vulnerability, it is promoting new ways of thinking and acting to promote integrated water and biodiversity management.

About AWARD

AWARD recognizes that the natural world's resources are limited and undergoing rapid depletion and transformation. It is aware that current practices of use and management are inadequate to deal with the changes and challenges being faced in the Olifants catchment as well as in the Limpopo Basin. AWARD has and continues to design practical interventions to address the vulnerability of people and ecosystems, and merge considerations from both environmental and social perspectives. Its approach involves thinking across disciplines, boundaries and systems and working with diverse people and institutions in the water and biodiversity sectors in the Olifants River Catchment to understand the multiple vulnerabilities to change, including climate change. Along with quality scientific contributions, AWARD's engagement in the socio-political context of the Olifants River Catchment allows it to institutionalize integrated, resilience-based practices, providing a foundation for robust development policy and practice in this river catchment, and beyond.

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