

Reducing business risk through municipal leakage reduction

Emfuleni, South Africa

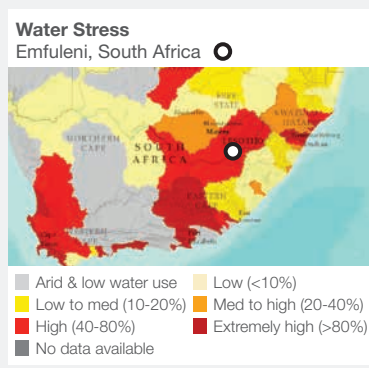
water scarcity impact

Reduced withdrawal	●
Reduced consumption	●
Improved water quality	
Increased productivity	●
Net basin benefit	●

volumetric impact
10 000 000 m³/yr

capital cost
\$2 500 000

estimated unit cost of water
<5 ¢/m³



Water Stress Map:
Gassert, F., M. Landis, M. Luck, P. Reig, and T. Shiao. 2013. "Aqueduct Global Maps 2.0."

Confidence level
● Low ● Medium ● High

Water Scarcity Impact Key
● Main ● Minor

Credits
We wish to acknowledge the input of Emfuleni Local Municipality in the preparation of this case study.

Project Overview

The integrated Orange-Senqu River System supplies water to 60% of South Africa's economy and to neighbouring Lesotho, Botswana and Namibia; it is under extreme water stress and severe water shortages could be experienced in the near future. Emfuleni Local Municipality (ELM), is located in the catchment and experiences annual mean water losses of 44% (36 000 000m³), and in some areas in excess of 80%. Like many other South African municipalities, it does not have the necessary capacity, instruments or resources to reduce its water demand.

The intervention involves a public-private partnership between the ELM, Sasol New Energy and GIZ, with additional participation from ORASECOM (the Orange-Senqu River Commission). The project reduces Sasol's water risks whilst simultaneously reducing the municipality's costs and its increasing water supply security. Meanwhile it supports the wider ORASECOM's objectives which are to reduce stress on the water resources of the Orange-Senqu River.

The project involves pressure management, network leakage reduction and domestic leakage reduction in over 80 000 properties.

Key Elements

- Innovative performance based public private partnership involving industry, local government and funding agencies.
- Reinvestment of audited ring-fenced savings to ensure continuity of the intervention for two to three years.
- Education, capacity and awareness building to gain community support.
- High degree of buy-in from stakeholders.
- Installation of an advanced pressure management system.
- Mains and domestic leakage repairs.

Key Outcomes

- 10 000 000m³/yr of water saved in phase 1. It is forecasted this will increase to 12 000 000m³ by 2014.
- Financial savings of almost \$10m are expected which will be reinvested in the project and will in turn create further savings.
- Capacity is being created within both the municipality and the local community in various forms including:
 - over 20 Community Liaison Officers.
 - 50 basic plumbing teams capable of repairing most of the common internal plumbing leaks.
 - education and awareness at schools and within the municipal managers.



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Intervention Features

- Replacement of tap and toilet washers
- Municipal leakage detection and repair
- Pressure management in municipalities
- Flow monitoring in municipalities
- Education, technical training and capacity building
- Stakeholder engagement

Project Levers

(1) Innovative public-private collaboration:

Seed funding for the current phase (2011-2014) was provided by GIZ (\$0.56m) and Sasol New Energy (\$0.56m), with further funding from ELM (about \$2.22m) based on the savings achieved in the first year. These savings are expected to exceed \$7.2m by the end of the project based on the purchase price of more than \$0.5/m³ paid by the ELM. GIZ and Sasol also provide technical support and facilitation.

It was necessary to ring fence the water savings for use on future water demand and loss management interventions. The reinvestment of the savings is an essential element of the project. Managing the water savings and accessing future funds required the establishment of robust and transparent auditing mechanisms.

(2) Education, awareness and capacity building:

A key element of the project was education and awareness in the community and schools on various water conservation issues and on the development of new or the support of existing community plumbing entities.

Fifteen “Water Warriors” were appointed to carry out house house visits to raise awareness of the leakage problems and the need to save water.

(3) Leakage repairs:

Around 30 local plumbers were appointed to follow up the ‘Water Warrior’ house visits. By February 2013 more than 30 000 tap and 50 000 toilet washers had been replaced on 23 000 properties. 25 schools have been audited and leakages repaired. Internal repairs have been complemented by ongoing repairs to the distribution network.

(4) Monitoring and evaluation:

More than 20 GSM flow and pressure loggers were installed which provide real-time information. This data acquisition and display system has helped to improve the understanding of the water supply and demand balance, the identification of priority areas for leak repairs, and the monitoring of savings.

Outcomes and Challenges

The main outcome of the pilot project has been the successful establishment of an innovative public private partnership to provide funding for water demand management activities within the Emfuleni Local Municipality. Other impacts of the project include:

- Significant water savings estimated to reach 12 000m³/year by June 2014 and a concomitant reduction in water risks for all users on the catchment; allowing more water to stay in the shared river basin and thereby increasing availability to other users and even neighbouring riparian countries.
- Reinvestment of \$7.22m from savings in various interventions that will themselves result in further savings.
- Allowing Sasol to offset its own water use and help secure its own future water supply.
- ELM water purchases have reduced due to the lower water losses which in turn resulted in significant energy savings since all water supplied to the area is pumped 45m in elevation.
- The project increased security of supply for residents. Without the interventions, the area would be operating on intermittent supply which also has serious water quality implications.
- Development of a model that can be replicated by many other municipalities operating under similar circumstances.
- Increased level of community awareness of the value of water and the necessity to reduce wastage.



Above: Burst pipe in Evaton (© Morena Mokubung)