Water loss reduction

Turning water losses into money savings and direct benefits for local populations across the Southern African region

The challenge

Increasing water scarcity, population growth and augmenting economic development are presenting huge challenges for the sustainable management of water resources in Southern Africa and existing pressures are exacerbated by climate change. One of the key issues encountered in the already water-scarce region are water losses in the municipal water supply systems due to leakages in pipes and plumbing as well as wastage at the point of use. This constrains basic welfare and economic development, and typically it is the poor who are disproportionately adversely affected by these resource management and service delivery problems.

Regional learning in practice

In cooperation with the Southern African Development Community (SADC) and its River Basin Organizations (RBOs), GIZ has run three water loss reduction pilot projects with local municipalities and private companies in South Africa, Botswana and Namibia from 2012 to 2017. Through targeted technical interventions, trainings and awareness-raising measures, it was shown that ample water savings and financial benefits could be achieved with a modest capital outlay. The project model consisted in GIZ and respective private companies providing seed-funding to municipalities to start activities in water loss reduction, which were then combined with ring-fencing of funds and re-investment of the saved amounts to further improve services to the public.

It all started in South Africa …

Emfuleni Municipality, situated south of Johannesburg, is located in the Vaal catchment. The Vaal is a tributary to the transboundary Orange-Senqu River and crucially supports economic activities in South Africa’s economic hub, Gauteng. At the beginning of the project in Emfuleni, more than half of the water purchased from the bulk water provider (Rand Water) was lost due to leakages in the reticulation system or due to leaking taps and toilets, leading to an overall loss of treated water of about 30,000,000 m³ per annum.

The Project Metsi-a-Lekoa - a partnership between Emfuleni Municipality, the chemicals and energy company SASOL and GIZ - focused on addressing water losses at the local community level. The measures included the reduction of physical water losses through pressure management and repair of leakages. Job creation was promoted, as plumbing tasks teams were locally recruited and specially trained. There was a particular focus on women and their role as change agents. This included empowering women by, for instance, hiring them as plumbers or training them as advocates, so called “water warriors”.

With an initial seed funding of € 1,000,000 by SASOL and GIZ, the project targeted 117,000 households with a population of 400,000 and estimated monthly water demand of 82,000,000 m³. The water consumption was reduced by 8.5% to 75,000,000 m³ – a reduction of 7,000,000 m³. With a purchasing cost of € 0.4 per m³, this represented a saving of € 2,500,000 for the water utility over the project period – a considerable success and holding the potential for even bigger savings given the overall population of about 720,000.

… then Botswana decided to replicate …

In Botswana, one of the most water scarce countries in the SADC region, the current demographic development combined with climate change effects are leading to dramatic consequences. Beginning of 2015 Gaborone dam, which supplys the capital with drinking water, was almost empty. Water had to be pumped from several hundred kilometres away and water rationing was a daily occurrence.

Inspired by the success of the Emfuleni Pilot, Water Utilities Corporation (WUC), First National Bank Botswana (FNBB) Foundation and GIZ joined forces to start Project Somarela Thothi. The aim was to reduce the water demand through the implementation of social and technical water loss reduction initiatives. The social interventions focused on creating awareness to conserve water through promotional material, schools awareness cam-

Left image: Thothi Mascot - School Awareness Campaign Botswana © GIZ
Right image: Leak Flow Rate from a single 6 mm hole and the equivalent volume of water © GIZ
Left image page 2: Chemicals and Energy Company SASOL - Bulk Water User and Project Partner in South Africa © GIZ
Right Image page 2: Water Leak© GIZ
campaigns and various outreach activities. The technical interventions focused on bulk metering and sectorisation to assess leakages and the potential for pressure management.

Consumers benefit indirectly through improved network pressure management and the subsequent reduced number of bursts. Pressure management proved to be very cost effective in reducing water losses. WUC staff was also trained to undertake the various community awareness tasks in order to ensure transfer and retention of knowledge and skills.

With seed funding of € 220,000 and € 70,000 by GIZ and FNB Foundation respectively, the project generated a saving of 1,060,444 m³ per annum or € 500,000. The project area had a total population of 543,508 and the outreach campaign was directly involved with 71,025 people of the community which represents 13% of the population.

WUC has transferred the experience and expertise gained and implemented the approach in the town of Lobatse. In addition, the Botswana government has incorporated the up-scaling of the measures into a country-wide water sector investment programme.

... and finally Namibia took up the approach.

In Namibia’s capital Windhoek, public institutions namely government offices, schools, hospitals, correctional facilities etc. were among the largest water wasters and often did not employ proper or regular maintenance procedures.

Inspired by the lessons learned from the water loss reduction project in Botswana, the Namibian President Hage Geingob launched the Namibia National Water Leaks Campaign in 2016. The target was to ensure national water savings of 40% by urgently reducing water demand and fixing leaks on both private and government properties.

As part of the campaign, the government shifted the responsibility for the maintenance of the water infrastructure in public buildings to the Ministry of Agriculture, Water and Forestry. GIZ supports the ministry with targeted human capacity building for maintenance workers and provides necessary tools and instruments to carry out leakage control measures.

Small inputs, huge outputs through Public Private Partnerships

By pooling their resources and targeting interventions, private companies and GIZ kick-started water demand management initiatives that helped public water utilities realise significant water and cost savings as well as change their approach to service delivery. The table below gives an overview on inputs (seed-funding) and outputs (water savings, financial savings) for the two projects in South Africa and Botswana:

<table>
<thead>
<tr>
<th>Project</th>
<th>Duration</th>
<th>GIZ Seed Funding</th>
<th>Private Seed Funding</th>
<th>Water Savings</th>
<th>Financial Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emfuleni</td>
<td>15 months</td>
<td>€ 500,000</td>
<td>€ 500,000 SASOL</td>
<td>7,000,000 m³</td>
<td>€ 2,500,000</td>
</tr>
<tr>
<td>Gaborone</td>
<td>12 months</td>
<td>€ 220,000</td>
<td>€ 70,000 FNB Found.</td>
<td>1,000,000 m³</td>
<td>€ 500,000</td>
</tr>
</tbody>
</table>

While still monitoring the project in Namibia, we note that replication has required progressively less and less external assistance from GIZ. A real efficiency gain in the multiplier effect could be noted.

Way forward

GIZ input helped leverage private sector action to improve services and benefit to the public. At the same time, development partnerships offer companies an opportunity to invest in such projects with the backing of GIZ as a competent partner, thereby minimising their risks. SADC and its RBOs can play a vital role in these processes as water losses have basin wide repercussions and thus transboundary impact. The potential for further replicating this approach in the region is considerable given the persisting problem of high water losses in municipal water supply systems across Southern Africa.