

Water use reduction strategy in the food sector

Mossel Bay, South Africa

water scarcity impact

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

volumetric impact

120 000m³/yr

capital cost

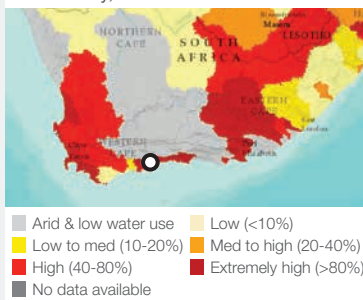
\$145 000

estimated unit cost of water

10¢/m³

Water Stress

Mossel Bay, South Africa



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 Sanjeev Raghurir of Nestlé South Africa in the preparation of this case study.

Project overview

Towards the end of 2010, the Western Cape region experienced its worst drought in more than 130 years. In the Mossel Bay area, the level of the Wolvedans Dam dropped to less than 20% full at the height of the drought threatening the operation of the Nestlé factory. The plant in Mossel Bay takes in approximately 320m³ of milk per day and processes it to condensed milk and powdered milk. In 2009, the average monthly water consumption at the factory was approximately 23 700m³ equivalent to 14.8m³ of water consumed per tonne of product produced. The project involved the implementation of a water use reduction strategy, actions included active monitoring of water use, engineering interventions to enable condensate reuse, retrofitting of low flow plumbing fixtures and active employee participation. The strategy was successful in reducing the plant's water consumption by approximately 50%.

Key Elements

- The project cost of \$145 000 was fully financed by Nestle to reduce business risk.
- Installation of a water measurement system to map and monitor water usage.
- Recovery and use of condensate from the milk evaporation process.
- Implementation of low flow plumbing fixtures.
- Active engagement of staff to reinforce water saving culture.

Key Outcomes

- The factory reduced its water use by approximately 50% from 284 000m³/yr to 163 000m³/yr.
- Water withdrawn per tonne of product produced was reduced from 14.8m³ to 7.5m³.
- Reduced water withdrawal from the Wolvedans Dam resulted in greater water availability for the Mossel Bay area.



Nestlé Mossel Bay, South Africa

Intervention Features

- Low flow showerheads
- Condensate recovery and reuse
- Industrial water metering
- Pressure management in factories
- Education, technical training and capacity building
- Stakeholder engagement
- Employee participation

Project Levers

(1) Water mapping and metering:

A complete water map was established for the plant, and thereafter a water usage measurement system was used to monitor water usage in the various sections of the plant. This provided invaluable information for the water volumes and water quantity and quality requirements for different parts of the plant.

(2) Water recovery and reuse:

The condensate from the milk evaporation processes was recovered and reused. The engineering work included insulation of existing tanks, construction of new water storage tanks and provision of recirculation pumps. The water is also treated prior to being used for non-potable purposes such as washing tanks, in boilers and cooling towers.

(3) Implementation of water saving measures:

Various water saving measures were implemented, such as shortening automated wash times, modifying hosepipe nozzles to reduce water flow, reducing shower head water flow and reducing the pressure in ablution blocks.

(4) Staff engagement:

Information was shared through notice boards and e-mails to reinforce the water saving messages to staff. Competitions were run and water saving suggestions by staff were implemented and rewarded. The staff engagement campaign took place during a period of imposed water restrictions on domestic households. Staff also utilised the provided information to save water at home.

Outcomes and Challenges

The project was approved and financed through Nestlé's annual capital investment programme. In this case the monetary benefit from the water savings was not significant; the main driver for the investment was to reduce the risk of any impact on the operation of the plant due to poor water availability.

The interventions produced the following outcomes:

- The factory reduced its water withdrawal per tonne of product produced by approximately 50% in 2010 compared to 2009 values.
- Water used per tonne of product produced dropped from 14.8m³ to 7.5m³.
- By the end of 2010, the average monthly water use at the factory had dropped from 23 700m³ to approximately 13 600m³.
- The reduced water usage at the factory has resulted in reduced water withdrawal from the Wolwedans Dam and more water availability for the Mossel Bay area.

The increasing variation in the rainfall in the Western Cape region, and subsequent water restrictions still poses concerns for the factory. Phases 2 and 3 of the water saving strategy are currently being implemented to further reduce water consumption and make the factory a zero-municipal water intake factory by 2015.

Nestlé are currently engaging with their supply chain and in particular farmers in the catchment to promote water efficiency measures. A handbook of sustainable farming practices is currently being produced and will be issued to local farmers. This will include tips on how farmers could save water and significantly reduce their increasing electricity bills.



Above: Wolwedans Dam in Mossel Bay, South Africa (© Michael De Nysschen | Dreamstime.com)