Federal Ministry
for Economic Cooperation
and Development

MÖRK
WATER

Potable Water for Zanzibar

Utilizing renewable energy for small-scale seawater desalination

Only half of Tanzania's population has access to safe, reliable and affordable drinking water. On the Island of Zanzibar, the Zanzibar Water Authority (ZAWA) struggles hard to keep its water supply network in operation. But it reaches into urban areas only and residents have to face the constant threat of impurities and breakdowns. Supplies by water trucks are more reliable but can only be afforded by those with stable incomes. Transport takes place over long distances, with some water even brought in by ships from the mainland.
Especially the rural population has to frequently access drinking water from precarious sources, such as contaminated boreholes or rivers. Diarrheal diseases or typhoid fevers are well-known and these conditions add their share to the high infant mortality rate on Zanzibar.

Self-sustaining Seawater-Desalination

The options to relieve problems have been increased through technological advancement in seawater desalination and progress in renewable energy supply. Small-scale and self-sufficient plants are now available at investment costs below
€ 38.000. The German engineering firm Mörk Water Solutions, a business unit of Mörk Bau GmbH & Co KG, and the University of Applied Science in Karlsruhe, Germany, have brought a desalination plant on the market that runs on solar and wind power, can be managed by local communities and produces 100 liters of clean, potable water per hour.
Given an average operating time of 12 hours per day a single plant can satisfy 600 people's drinking water requirements per day. A sales price of € 0.03 per liter allows even the poor to buy their provisions and yet amortization can be reached within four years.
The main module of the plant has already been field tested successfully in India and Bangladesh. An important partner was the company Dow Chemical.

However, the core challenges for a successful operation and rollout of the plants do not lie in its technology. In order to achieve a sustainable and affordable drinking water supply on a wider scale, awareness and acceptance among the population has to be accomplished. In addition, a working business model for its operation has to be implemented and the maintenance infrastructure has to be created.

"The cooperation with GIZ and their regional experience and networks helped us to minimise risks and develop new market potentials."

Johannes Puy, Business Unit Manager, Mörk Water Solutions

Demonstrating the Solution in Practice

To overcome those challenges, Mörk Water Solutions, Dow Chemicals and Karlsruhe University entered into a development partnership with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) in 2011. Together with the local training-NGO Pamoja Zanzibar and the Karume Institute of Science and Technology (KIST), they are establishing two pilot plants to show the adequacy and operational suitability under Zanzibar's conditions. A first pilot desalination plant was installed in a village with water

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scarcity close to Zanzibar Town in November 2011, supplying 600 people with drinking water.
This plant provides the data and feedback concerning the use in a practical day-to-day operating situation. Additionally, it creates awareness and serves as training facility, as it is located close to the public bodies, intermediary organizations and interested private parties concerned with water supply issues.
The second plant is built in a rural location on Kokota Island, a small fishing village belonging to Zanzibar.

The local population, their community organizations and public administration enter into a dialogue. It is crucial that the target group is not only seen as water consumers. They are also responsible for the operation and maintenance of the plants. The partners have developed a comprehensive concept for assuring the long-term success and developmental impact of bringing small scale desalination plants to Zanzibar:

- A curriculum and training material were made available for the partner institutions. It comprises modules on water treatment/desalination and renewable solar energy, which were implemented by KIST and Pamoja. Teachers were trained and first courses were run at Pamoja's Chukwani Vocational Training Center until mid-2013. This training is directed at future operating personnel of Mörk plants as well as multipliers and intermediaries for desalination and renewable energies.

- To show economic and developmental feasibility is a prerequisite for the roll-out of the program. Results and impact of the demonstration sites are monitored and used for promotional activities and awareness creation island-wide. A business model is established that allows domestic finance institutions to fund the initial investment through microcredits for individuals, cooperatives or community based bodies.

- The partners establish technical support for the pilot plants as well as the ensuing commercial investments in Mörk desalination plants on Zanzibar. A representative of Mörk is based on the island and initiates the development of the local support and maintenance infrastructure and services. A physical service and spare-part center is established.

Term:	November 2011 to December 2013
Country:	Zanzibar, Tanzania
Partner:	Mörk Water Solutions Dow Chemical Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Impacts:	• Two pilot plants have been installed for saltwater desalination. • The price per litre of clean drinking water has dropped from 20 euro cents to 3 euro cents. • An operator modell has been established.

Long-term Commitment

Market assessments show that self-sustaining seawater desalination plants will make up about three to five percent of the total desalination market. Zanzibar has been identified by the private development partner as an ideal location for developing business on the African market, especially Tanzania.
Mörk wishes to establish an own service and sales infrastructure in the country to distribute its water product solutions and to eventually participate in larger scale desalination projects.
The current development partnership provides excellent opportunities to disseminate product awareness and to gain important legal, administrative and cultural know-how.

By sustainably addressing community needs for affordable potable water, the partnership contributes to better hygienic and health conditions to populations even in remote areas. It creates income streams within the local economy and promotes an entrepreneurial spirit with a developmental conscious. The project has been received positively. The regional Water Authority, as well as NGOs and businesses such as hotels have shown high interest.These are potential operators of desalination plants which through social business or green tourism initiatives will benefit the local population. Extensive awareness raising measures and information events will further strengthen their interest.

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