



SYRIA

CLIMATE CHANGE MITIGATION ENERGY EFFICIENCY INSTITUTIONAL STRENGTHENING OF THE WATER UTILITY DAMASCUS



Client GIZ / DAWSSA
Financing GIZ
Duration of Services 01/2010 – 02/2012

Scope of Services

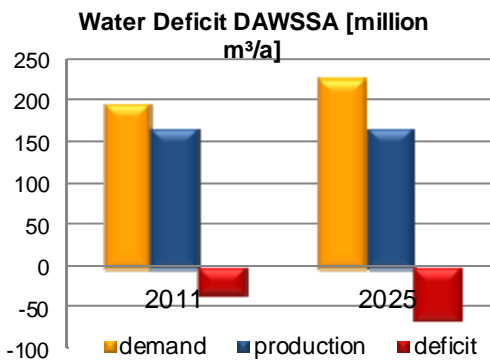
- Concept to manage the available water resources
- Assessment of existing water resources (wells and surface water resources)
- Flow measurements to determine production figures
- Assessment of pump efficiency
- Development of energy efficiency measures
- Identification of measures to distribute surplus water to undersupplied areas incl. definition of physical investment requirements

Context and Challenge

After the merger process of the former RDWSSA (Water Utility of Damascus Rif) and DAWSSA (Water Utility of Damascus City) in 2009, the merged utility has to serve more than 2 million inhabitants with safe and reliable water supply spread over an area as large as the Lebanon. In the Damascus Rif the major share of water supply is being provided by pumped groundwater. Thus, DAWSSA is one of the biggest power consumer in Damascus. Apart from high costs, water pumping is a major source of GHG emissions as power generation is based on fossil fuels in Syria.

Project Description

The project aimed at the development of a Water Supply and Demand Management (WSDM) as an objective oriented approach to influence water consumption so as to achieve a more efficient and cost effective water use. For this purpose in a first step a comprehensive flow measurement programme was established and implemented. DAWSSA's records show nearly 2,000 existing wells out of which only 65% are in operation.



The results indicate an increasing overall water deficit to be expected for the service area whereby the northern Water Economic Units (WEUs) close to the mountains show a positive balance while the southern WEUs suffer from low groundwater levels and deteriorated water quality due to nitrate pollution. 22% of the produced water quantities exceed the Syrian standard for nitrate. These volumes would need to be treated in a WTP or blended with low nitrate water from other regions.

Recommendations to reduce the deficits are described in detail in the WEU specific reports and include among others:

- Exploitation of additional resources
- Technical measures to increase pumping efficiency
- Artificial Recharge
- Construction of a central Water Treatment Plant

Further reduction of the average energy consumption can be realized by improvement of the design and construction, technical equipment and monitoring of wells.

Implementation of the technical measures (see box) would thus reduce energy costs as pumping efficiency increase is closely linked to power demand. Currently, the production of one cubic meter of water requires 1.1 kW. For the annual production of 167.3 Mm³ of drinking water 184 GWh/a are necessary.

A reduction of energy demand from currently 1.1 kW/m³ to 0.7 kW/m³ through the recommended measures would save 50 GWh/a or 2 million EUR/year.

Technical measures recommended include

- Implementation of Well drilling techniques with a lower compaction and therefore higher hydraulic permeability of the area surrounding the drill hole
- Development of the wells to state of the art technologies (gravel filter, filtration pipe, level measurement)
- Regular inspection and cleaning of the wells
- Yield measurement of the wells and adjustment of the pump onto the new characteristics
- Ensure 1:1 replacements of pumps
- Ensure qualified repair of pumps
- Adjustment of the pumps to deviating ground water levels (frequency control depending on water level, adjustment of pump depth)
- Equipment of the pumps with dry run protections and idle power compensation
- Construction of new wells only on locations with a good hydraulic permeability
- Equipment of all wells with standard wellheads which include a dirt trap, flow measurement device with sufficient up and downstream zones, a non-return-valve, a isolating valve and a valve for sampling