

Institutional capacity building approach to managing industrial water use

Nationwide, the Hashemite Kingdom of Jordan

water scarcity impact

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

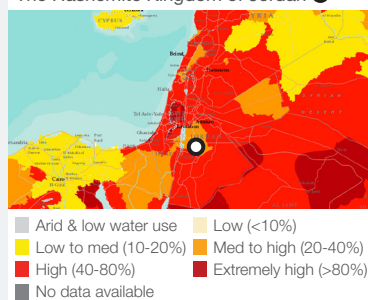
volumetric impact
739 000 m³/yr

programme cost
\$7 786 000

estimated unit cost of water
30 ¢/m³

Water Stress

The Hashemite Kingdom of Jordan



Water Stress Map:
F. Gassert, P. Reig, T. Shiao, M. Luck and M. Landis, 2015. "Aqueduct Global Maps 2.1."

Confidence level
● Low ● Medium ● High

Water Scarcity Impact Key
● Main ● Minor

Credits
We would like to acknowledge USAID Jordan and Charles Darnell and Carol Williams of AECOM for their input in the preparation of this case study.

Project Overview

The industrial sector accounts for 30% of Jordan's GDP and is a major driver of growth. The country is classified by the World Resources Institute as one of the 30 most water stressed countries in the world with a water supply deficit projected to reach 365 million cubic meters by 2030. The ongoing water scarcity crisis poses a major threat to the economic stability of the industrial sector and Jordan as a whole.

The USAID Water Reuse and Environmental Conservation Programme ran from 2010-2015. Two of its four major tasks focused on institutional capacity building and pollution prevention for industry. The project team worked with the Ministry of Environment (MoEnv) to build their regulatory capacity and strengthen national capacity to analyse industrial water use and effluent discharges.

The programme targeted 30 factories in which detailed water and energy efficiency audits were conducted. This drove a programme of interventions that were self financed by the 30 target facilities and reduced water withdrawals by 739 000 m³ per annum.

Key Elements

- Institutional and regulatory strengthening of the Ministry of Environment.
- Improving access to high-quality industrial wastewater testing facilities through capacity building of three selected laboratories.
- Audits targeting 30 facilities in five industrial sectors to demonstrate opportunities for reductions in water and energy use.

Key Outcomes

- Intervention strategies adopted across the thirty partner facilities resulted in the following:
 - 739 000 m³ per annum reduction in water withdrawal
 - 971 000 litres per annum reduction in diesel consumption
 - 7 500 000 kWh per annum reduction in energy consumption
- Self financing facilitated through the demonstration of the potential financial savings associated with reduced energy and materials use.
- New Environmental Protection Law was drafted and policies and regulations have been put in place in the areas of environmental licensing and inspection, integrated waste management and information sharing and disclosure.
- Two of the three targeted laboratories have achieved International accreditation.



The Hashemite Kingdom of Jordan

Intervention Features

- Institutional reform
- Education, technical training and capacity building
- Stakeholder engagement
- Water audits
- Energy audits

Project Levers

(1) Capacity building and stakeholder engagement

The team worked closely with the MoEnv to develop the new Environmental Protection Law and redesign the process of granting environmental approvals based on Environmental Impact Assessments. Stakeholder engagement across the public and private sectors provided the broad consensus on the need for reform. MoEnv staff were trained in order to build their capacity in implementing new legislation.

(2) Financing

The programme received \$6 688 000 from USAID. A total of \$1 097 000 was invested by the 30 partner facilities to implement interventions.

(3) Water and Energy Audits

The water and energy audits conducted by USAID outlined potential intervention strategies as well as their associated payback periods. The emphasis was on how specific investments could improve environmental performance and increase profitability. This assessment provided the financial validation required to convince factory owners to make the necessary investment.

(4) Partner selection

A detailed survey across 400 industrial facilities was initially conducted around the country. 120 of these facilities were then invited to attend technical training sessions leading to the final selection of 30 facilities as project partners. These were selected based on the willingness of factories to participate and the potential impact of the interventions. A similar process was adopted in the selection of partner laboratories to receive technical assistance.

Outcomes and Challenges

Interventions had payback periods ranging from 0-4.5 years. Due to the low water tariff of \$1.5 per m³, the interventions were predominantly justified on the associated energy and materials efficiency improvements.

Category	Total annual savings
Water	\$59 500
Energy	\$450 000
Materials and waste	\$429 000
Total	\$938 500

In 2013, the Jordanian government introduced a five-year plan to incrementally increase the cost of electricity by almost 15%. This will further increase cost savings and reduce payback periods.

Follow up audits on each of the 30 facilities were conducted 9 to 18 months after the pollution prevention assessments were submitted. 37% of the implementation options recommended had been completed at the time of audit. 33% were partially completed, and 31% had not yet begun. Thus, further water benefits are likely to be realised as interventions are implemented.

The high turnover of leadership and staff within the MoEnv had a negative impact on organisational knowledge and project follow through. This required the project team to re-introduce the project several times within a five-year period. The progress made in spite of this challenge is a reflection of the strength of the relationship of the project team with the ministry. The high turnover poses a challenge with regards to the sustainability of this progress beyond the programme timeline.



Above: Project handover ceremony ©USAID