Agricultural

Basin based approach for groundwater management

Neemrana, District of Alwar, Rajasthan, India

water scarcity impact

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

volumetric impact

2 366 400 m^3/yr

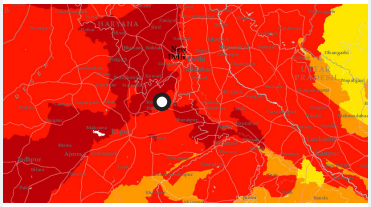
capital cost

confidential

estimated unit cost of water

not applicable

Water Stress
Rajasthan, India



Arid & low water use
Low (<10%)
Low to med (10-20%)
Med to high (20-40%)
High (40-80%)
Extremely high (>80%)
No data available

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 SABMiller India and the Confederation of Indian Industry (CII) for their input in the preparation of this case study.

Project Overview

SABMiller India partnered with local stakeholders in Alwar to implement a basin-wide groundwater management initiative which ensures the security and sustainability of the local deep aquifer.

The deep aquifer is the only reliable source of water supply for the agricultural, industrial and municipal sectors in the semi-arid region. The seasonal monsoon rainfall is the only other source of water supply.

A study of the region's hydrology identified a gap of 59 000 000 m^3 between natural groundwater recharge and abstraction resulting in a 0.9 m/year drop in the water table. A plan was launched to increase groundwater recharge through the construction of six recharge structures.

Scheduled training programmes for local farmers on water efficiency practices were also implemented to reduce withdrawal for agricultural purposes. This is benefiting more than 4 000 farms on a regular basis. In addition, water efficient agricultural practices were showcased by 136 knowledge farms covering 105 ha in 68 villages.

The project was financed by SABMiller India. The initiative has improved the management of the local deep aquifer and the security of supply for the Roches Brewery in Neemrana.

Key Elements

- Partnership approach to deliver the groundwater management initiative.
- Identification of suitable locations and construction of six recharge structures to the deep bedrock aquifer.
- 136 demonstration farms showcasing water efficient practices coupled with farmer outreach and training programme.

Key Outcomes

- 345 000 m^3/year of enhanced recharge of the aquifer resulting in 5.2m rise in water table locally.
- 38 000 m^3/year reduction in agricultural withdrawals through improved irrigation practices on 105 ha of demonstration plots.
- Approximately 2 000 000 m^3/year reduction in agricultural withdrawals resulting from the outreach programme.
- 23% increased crop productivity over traditional agricultural practices leading to increase of 21% net income for the participating farmers.

Rajasthan, India

Intervention Features

- Alternative water sources
- Education, technical training and capacity building
- Stakeholder engagement

Project Levers

(1) Security and sustainability of water resources

The need to secure the water supply from the local deep aquifer prompted SABMiller India to initiate the project.

(2) Partnership approach to delivery of the initiative

SABMiller India delivered the project in partnership with Confederation of Indian Industries (CII), Advanced Centre for Water Resources Development and Management (ACWADAM), Gridline Consultancy and Humana People to People; a local NGO.

(3) Construction of recharge structures

Based on a hydrogeological study and evaluation of the sustainable withdrawal rates, SABMiller India constructed six deep aquifer recharge structures composed of earth and concrete embankments and vertical shafts to bedrock in proximity of abstraction wells of the Roches Brewery. These structures were sized to recharge, as a minimum, the equivalent volume withdrawn by the brewery from the aquifer.

(4) Demonstration farms and outreach programme

Two farms were selected in each of the 68 target villages to participate in the SABMiller Farmers Outreach Strategy. The farms demonstrated improved crop management practices and productivity and reduced water withdrawals. These practices were promoted alongside training courses to improve farmers' knowledge. The programme did not include subsidies and the farmers were encouraged to invest in the programme.

Outcomes and Challenges

The aquifer recharge scheme captured water that would have run off and been lost from the basin through high evaporation rates and offset the brewery withdrawals. It resulted in a water table rise of 5.2m locally following the monsoon season.

The demonstration farms and farmer outreach programmes were designed to address the agricultural water use that accounted for 87% of total abstraction from the aquifer. For every demonstration farm, another 20 farmers voluntarily changed their farming practices. The participating farmers reported reduction of water withdrawal, estimated at 2 000 000 m^3/year, and a 23% increase in productivity. The resulting 21% increase in the farmer's income enhanced the reputation and popularity of the programme among the farmers.

These combined interventions have reduced the recharge gap by 32% to 40 000 000 m^3/year. Further actions to bridge the gap will be necessary. These may include construction of more recharge structures and the promotion of precision farming techniques based on the concepts of soil moisture management and plant growth management.

Above: Recharge Structure and local farmer (© SABMiller India).