



Dhahran Circular Water Strategy

Dhahran's water strategy focuses on conserving groundwater and protecting the environment by embedding a Circular Water Economy approach. It applies the principles of Reduce, Recover, and Regenerate to build a sustainable water cycle for the Dhahranian community. Through partnerships with the private sector, Aramco is securing renewable water sources and reducing reliance on nonrenewable resources. As a result, groundwater use has been cut by 50%, the use of treated sewage effluent (TSE) for irrigation has increased from 35% to 80%, and new ecosystems have been created that enhance local biodiversity.

-  **REDUCE**
-  **RECOVER**
-  **REGENERATE**

-  **DHAHRAN, SAUDI ARABIA**
-  **WASTEWATER**
-  **DRINKING WATER**
-  **INDUSTRIAL**



CHALLENGES FACED

- Establishing partnerships with the private sector requires alignment of interests and shared goals.
- Upgrading aging water infrastructure, which entails significant investment and logistical challenges.
- Engaging the community and promoting awareness about the benefits of water reuse and conservation practices.
- Having effective monitoring systems in place for TSE utilization and water conservation efforts requires advanced data management solutions.

TECHNOLOGIES & SOLUTIONS USED

- Installed smart water meters and used data analytics to monitor use, detect leaks, and guide conservation.
- Partnered with the private sector to expand reverse osmosis desalination, saving groundwater.
- Built a dedicated treated sewage effluent distribution system for irrigation and industrial uses.
- Developed constructed wetlands that prevent overflow, and create habitats for wildlife and migratory birds.

IMPACT & INSIGHTS



- Annual groundwater saved: 20.7 million m³.
- Annual seawater desalinated: 16.5 million m³.
- Annual wastewater reduction: more than 400.000 m³.
- Reduction in excessive water use: 5% decrease in overall water consumption.
- Improvement from upgrading water network: over a 30% of increase in efficiency.

LESSONS LEARNED



- Be prepared to adapt your strategy as you gather data and feedback. This includes the adaptation of the 3 Rs framework at the planning stage.
- Maintain open lines of communication with all stakeholders, which fosters trust and transparency.
- Regular updates can keep everyone informed and motivated.
- Ensure that the initiative is not just a short-term fix but has long-term viability. This includes considering funding sources, maintenance, and community engagement in ongoing efforts.

“Aramco runs community education programs focused on water conservation and the benefits of using treated wastewater. These programs leverage digital platforms and workshops to engage local residents.”