



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.

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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.

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