

Desalination Plants In India

Desalination is the process of removing salts and minerals from saline water or seawater to make it fit for human use and consumption. Seawater has a salt concentration of 35,000 ppm. Desalination brings down the concentration to as low as 10 ppm which is considered ideal for drinking.

- **Reverse osmosis** is the most effective way to desalinate water and remove excess salts and minerals. In this process, water is made to flow through a semi-permeable membrane from a high solute concentration to a low solute concentration using external pressure.
- The pressure exerted on the salty water column negates the natural osmotic pressure of water and helps it flow through the membrane.
- The microscopic pores of the membrane prevent salt and other impurities from flowing to the other side. Clean water is collected on the other side of the membrane.

Most of the desalination plants use reverse osmosis including the Minjur plant, the first desalination project in India. It uses approximately 8,600 membranes to produce 100 million litres per day of freshwater through the reverse osmosis process.

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- The first desalination plant in India is Minjur in Tamil Nadu state in the year 2010. The 60-acre plant, based in Katupalli provides clean water to almost 500,000 population of Chennai.
- The second plant was inaugurated at Nemmeli in 2013 and has been functioning since then. Another plant is set to be ready by 2023 at Nemmeli which will further provide 150 ml of clean water to Chennai and surrounding regions. A plant is also proposed in the state of Andhra Pradesh.
- The second-largest desalination plant situated in Jamnagar of Gujarat produces approximately 96,000m³/day. Gujarat government has plans to set up 8 more desalination plants across the state with a capacity of 27 crore litres in the next few years.
- The new plants are proposed at Jodiya, Dwarka, Kutch, Dahej, Somnath, Bhavnagar, and Pipavav.
- A proposal to set up a desalination plant near Mumbai has been approved in 2020. The plant will be situated at Manori in a sprawling area of 25-30 acres and is expected to provide 200 MLD of clean water to the city.
- Desalination can be the answer to India's chronic and dire water problem. It could potentially create a parallel and reliable source of potable water not only for densely populated urban cities but also for rural areas with severe water scarcity. The government's enthusiastic programs to boost the growth of desalination technology will accelerate the process.

Need for Desalination Plants in India

The huge population of India has created tremendous pressure on the natural water resources of the region. Over-use of both above-surface and under-surface water resources has depleted the resources and created a chronic water scarcity. And the demand for more and more water is only going to increase in the coming years. Since India has almost 7,500 km of coastline, there is no dearth of seawater.

Desalination could prove to be the most eco-friendly and cost-effective solution for the water scarcity issue in the country. Desalination plants could provide a steady supply of clean water and reduce the pressure on freshwater sources. The practicality of desalination for achieving Sustainable Development Goal 6 must be increased by making desalination technology cheaper (SDG-6: Ensure Access to Water and Sanitation for All).

Although there are challenges with desalination plants such as disposal of salt and impurities collected during the process and cost of operations, they are still very promising as a solution to build a dependable alternative source of clean water.

