# Siphon-powered Desalination

A new **siphon-based thermal desalination system** developed by **Indian Institute of Science (IISc)** transforms **seawater into potable water.**

- It is faster, cheaper, and more efficiently than **traditional solar stills,** addressing India's water-stress challenges.
- **Thermal desalination** is a process that uses **heat to evaporate pure water from saltwater, mimicking the natural water cycle** by leaving salts behind and condensing the vapor into freshwater.
- Traditional **solar stills**, which copy nature's water cycle to clean water, have two main problems: **salt deposits** that block water flow and **size limits**, since wicking materials can lift water only about 10–15 cm, reducing output.

## Siphon-Powered Desalination System

- **About: It uses the principle of siphon (gravity-driven flow through a tube or wick).**
  - It uses a composite siphon (fabric wick + grooved metallic surface) to draw salty water from a reservoir, while gravity ensures smooth continuous flow. The siphon flushes out salts before crystallization, preventing buildup.
  - Water spreads as a thin film, evaporates, and condenses efficiently, producing over 6 liters of clean water per $m^2$ per hour under sunlight, several times higher than conventional solar stills.
- **Significance:** Siphon-Powered desalination unit is **low-cost, scalable, and sustainable**, built from simple materials like aluminum and fabric.
  - It runs on **solar or waste heat**, works in **off-grid and coastal regions**, and can treat **high-salinity water (up to 20%)** without clogging, making it a breakthrough in brine management.
  - Waste heat to power (WHP) is the process of capturing heat discarded by an existing thermal process and using that heat to generate power.

**Read more: Desalination Plants**