

Indigenous technology for conversion of sea water to potable water

July 22, 2022

In news– Ministry of Earth Sciences (MoES) has developed indigenous technology for conversion of sea water to potable water.

About the technology-

- Ministry of Earth Sciences (MoES) through its **autonomous Institute National Institute of Ocean Technology (NIOT)** has developed **Low Temperature Thermal Desalination (LTTD) technology for conversion of sea water to potable water** which has been successfully **demonstrated in Lakshadweep islands.**
- **Three desalination plants based on the LTTD technology have been developed** and demonstrated at Kavaratti, Agati and Minicoy Islands of Union Territory of Lakshadweep.
- **The capacity of each of these LTTD plants is 1 Lakh litre of potable water per day.**
- Based on the success of these plants, Ministry of Home Affairs (MHA) through Union Territory (UT) Lakshadweep has entrusted the work of establishing 6 more LTTD plants at Amini, Androth, Chetlet, Kadmat, Kalpeni and Kiltan with a capacity of 1.5 lakhs litres/day.
- **The LTTD technology is found suitable for Lakshadweep islands where the required temperature difference** of about 15°C between sea surface water and deep-sea water is found in the vicinity of Lakshadweep coasts only as of now.
- **The cost of desalination plant depends on a number of factors inter alia which includes** technology used and

location of plant.

Portable desalination unit by MIT-

- **Massachusetts Institute of Technology (MIT) researchers have developed a portable desalination unit, weighing less than 10 kg, that can remove particles and salts to generate drinking water.**
- **The suitcase-sized device requires less power to operate than a cell phone charger.**
- It can also be driven by a small, **portable solar panel**, which can be purchased online for around \$50 (about Rs 3,800 at current exchange rates).
- **The device automatically generates drinking water that exceeds World Health Organization (WHO) quality standards.** The device runs with the push of one button.
- While other portable desalination units that require water to pass through filters, **this device utilises electrical power to remove particles from drinking water.**
- **Eliminating the need for replacement filters** greatly reduces the long-term maintenance requirements.
- This could enable the unit to be deployed in remote and severely resource-limited areas.
- It could also be used to aid refugees fleeing natural disasters or by soldiers carrying out long-term military operations.
- **The unit relies on a technique called ion concentration polarisation, which was pioneered by Han's group more than 10 years ago.**
- **Rather than filtering water, the process applies an electrical field** that causes positively or negatively charged particles including salt molecules, bacteria, viruses to be repelled as they flow past.
- The charged particles are funnelled into a second stream of water that is eventually discharged. The process removes solids, allowing clean water to pass through the

channel.