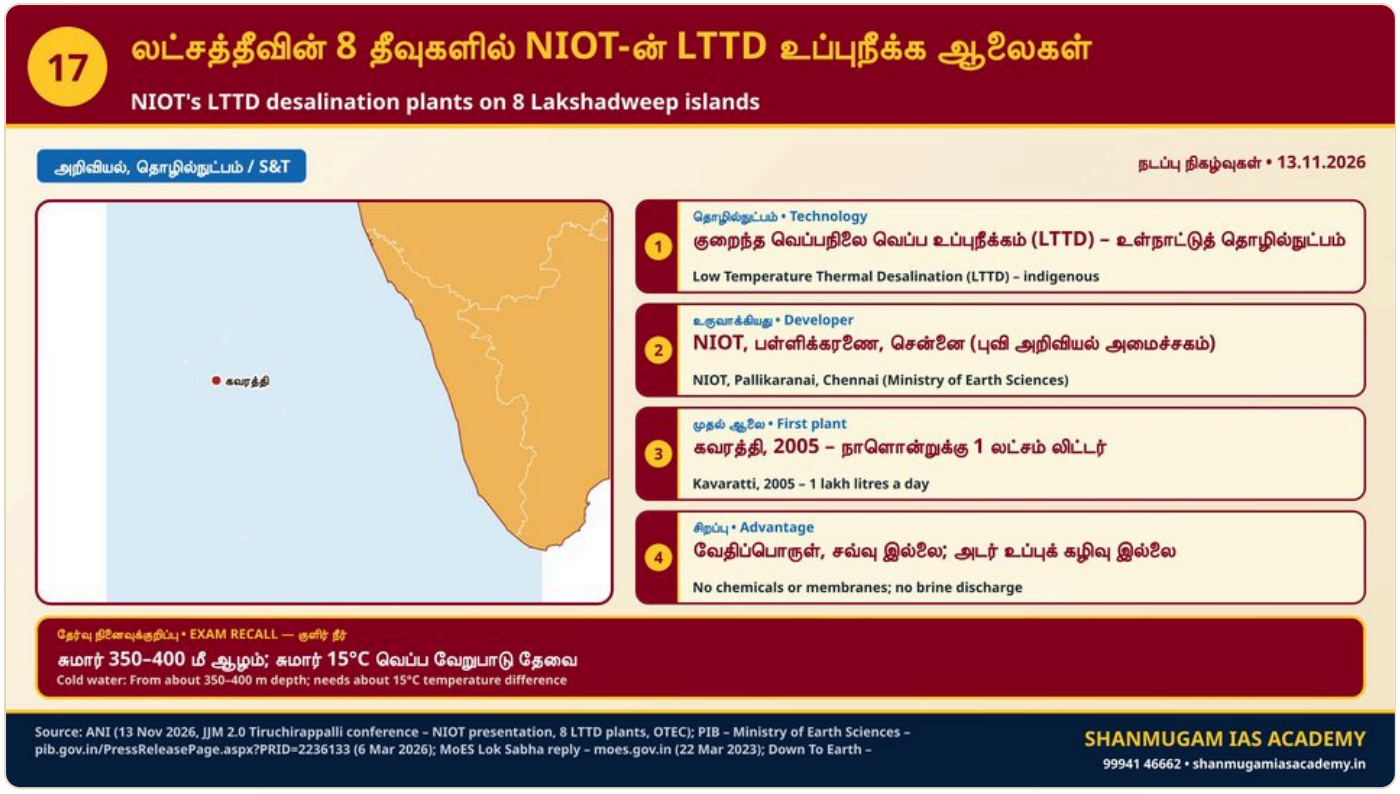
NIOT's LTTD desalination plants on 8 Lakshadweep islands

Topics: Science & Technology · UPSC Prelims · TNPSC · SSC · Current Affairs



News

Eight plants based on indigenous Low Temperature Thermal Desalination (LTTD) technology have been set up in Lakshadweep, supplying safe drinking water with minimal environmental impact. Phani Kumar, Project Director of the Chennai-based National Institute of Ocean Technology (NIOT), which developed it, presented the technology at the first Regional Conference on Jal Jeevan Mission 2.0 held in Tiruchirappalli on 12–13 November 2026 (ANI). At the same meet NIOT also showcased its Ocean Thermal Energy Conversion (OTEC) project, which combines power generation with desalination (conference details: news 2). The plants are on Kavaratti, Minicoy, Agatti, Amini, Kalpeni, Kadmat, Chetlat and Kiltan islands. Warm surface seawater is evaporated at low pressure and the vapour is condensed into fresh water using cold seawater drawn from about 350–400 m depth. No chemicals or high-pressure membranes are needed, and no concentrated brine – harmful to corals – is discharged. Lakshadweep's first LTTD plant was commissioned at Kavaratti in 2005; the OTEC plant is being built at Kavaratti.

Key facts for the exam

Point	Details
Technology	Low Temperature Thermal Desalination (LTTD) – indigenous
Developer	NIOT, Pallikaranai, Chennai (Ministry of Earth Sciences)
Plants	8 – Kavaratti, Minicoy, Agatti, Amini, Kalpeni, Kadmat, Chetlat, Kiltan

Point	Details
First plant	Kavaratti, 2005 – 1 lakh litres a day
Cold water	From about 350–400 m depth; needs about 15°C temperature difference
Advantage	No chemicals or membranes; no brine discharge
News platform	1st JJM 2.0 Regional Conference, Tiruchirappalli, 12–13 Nov 2026
Next step	OTEC plant at Kavaratti (planned 65 kW – Ministry of Earth Sciences)

Background

- Lakshadweep is India's smallest Union Territory, with Kavaratti as capital. The coral islands have no rivers; fresh groundwater floats as a thin rain-fed 'lens' over seawater. Over-extraction causes seawater intrusion and sewage contamination, leading to water scarcity. Lakshadweep comes under the jurisdiction of the High Court at Ernakulam (Keralam High Court).
- Science: when pressure falls, the boiling point of water falls. So in a vacuum chamber, surface seawater at about 28–30°C flash-evaporates. Cold deep-sea water (about 7–15°C) condenses the vapour into fresh water. Unlike reverse osmosis (RO), no high-pressure pumps or membranes are needed.
- NIOT was set up in 1993 as an autonomous institute under the then Department of Ocean Development; it now functions under the Ministry of Earth Sciences. It also runs the 'Samudrayaan' deep-ocean crewed submersible 'Matsya-6000' project. Union Minister Dr Jitendra Singh visited the Kavaratti LTTD plant in March 2026.
- The 'Jal Jeevan Mission' was launched in 2019 to provide tap water to every rural household; its second phase, JJM 2.0, stresses source sustainability, community participation and reforms. The Tiruchirappalli meet is the first of five planned regional conferences.

Tamil Nadu link: NIOT, which developed LTTD, is at Pallikaranai, Chennai. The technology was presented at the JJM 2.0 regional conference in Tiruchirappalli, co-hosted by the Tamil Nadu Government. NIOT ran an experimental 10-lakh-litre-a-day floating plant off Chennai in 2007 and a trial plant using cooling water of the North Chennai Thermal Power Station in 2009. Chennai city gets water from the Minjur and Nemmeli seawater (RO) desalination plants.

Frequently asked questions

What is this news about?

Eight plants based on indigenous Low Temperature Thermal Desalination (LTTD) technology have been set up in Lakshadweep, supplying safe drinking water with minimal environmental impact.

What are the key facts to remember for the exam?

Technology: Low Temperature Thermal Desalination (LTTD) – indigenous; Developer: NIOT, Pallikaranai, Chennai (Ministry of Earth Sciences); Plants: 8 – Kavaratti, Minicoy, Agatti, Amini, Kalpeni, Kadmat, Chetlat, Kiltan; First plant: Kavaratti, 2005 – 1 lakh litres a day.

What is the background to this news?

Lakshadweep is India's smallest Union Territory, with Kavaratti as capital. The coral islands have no rivers; fresh groundwater floats as a thin rain-fed 'lens' over seawater.

Practice questions (with answers)

1. Where is the National Institute of Ocean Technology (NIOT), which developed Lakshadweep's LTTD plants, located?

A) Chennai

B) Goa

C) Hyderabad

D) Visakhapatnam

Answer: A – Explanation: Pallikaranai, Chennai – Ministry of Earth Sciences, 1993. Goa has the NIO; Hyderabad has INCOIS.

2. In LTTD, the vapour from warm surface seawater is condensed into fresh water using –

A) Membrane filters

B) Solar heat

C) Cold deep-sea water

D) Chemical coagulants

Answer: C – Explanation: Cold seawater pumped from about 350–400 m depth. The needed ~15°C temperature gap occurs near Lakshadweep.

3. Why does seawater boil far below 100°C in the vacuum chamber of an LTTD plant?

A) Salt in the water

B) Deep water is warmer

C) Pressure is raised

D) Pressure is lowered

Answer: D – Explanation: Lower pressure lowers the boiling point, as on mountain tops. Dissolved salt actually raises the boiling point.

4. Lakshadweep's first LTTD plant (2005) is on which island, the capital of the Union Territory?

A) Kavaratti

B) Minicoy

C) Agatti

D) Amini

Answer: A – Explanation: Kavaratti – 1 lakh litres a day. An OTEC plant is also coming up there. Agatti has the islands' airport.

5. The Union Territory of Lakshadweep comes under the jurisdiction of which High Court?

A) Madras

B) Keralam

C) Karnataka

D) Bombay

Answer: B – Explanation: The Keralam High Court (Ernakulam). Puducherry comes under the Madras HC; Andaman & Nicobar under the Calcutta HC.

Sources: ANI (13 Nov 2026, JJM 2.0 Tiruchirappalli conference – NIOT presentation, 8 LTTD plants, OTEC); PIB – Ministry of Earth Sciences – pib.gov.in/PressReleasePage.aspx?PRID=2236133 (6 Mar 2026); MoES Lok Sabha reply – moes.gov.in (22 Mar 2023); Down To Earth – downtoearth.org.in (4 Aug 2022, OTEC); ThePrint – theprint.in (Mar 2026); NIOT – niot.res.in (LTTD). © Shanmugam IAS Academy.