



THE HINDU



GS Paper 3-Environment

T.N.'s mangrove cover has doubled between 2021 and 2024: report

The Hindu Bureau
CHENNAI

The mangrove forest cover in Tamil Nadu has almost doubled in the last few years, expanding from 4,500 ha in 2021 to 9,039 ha in 2024.

The increase can be attributed to both new mangrove plantations and the preservation of existing ones across several districts, according to a report by the Centre for Climate Change and Disaster Management, Anna University.

The report, titled 'Blue Carbon Monitoring for



Ecologically crucial: Some of the key districts contributing to the State's mangrove cover, include Cuddalore and Nagapattinam, with 1,117 ha and 1,021 ha, respectively. FILE PHOTO

grove cover in Cuddalore, ological stability, providing the mangrove forest cover



KEY POINTS

Tamil Nadu's mangrove forest cover has almost doubled from 4,500 hectares in 2021 to 9,039 hectares in 2024 due to new plantations and conservation. Mangroves, thriving in brackish water, help mitigate climate change by stabilizing coastlines, reducing erosion, and protecting communities from natural disasters. They face threats from agriculture, overfishing, urbanization, and environmental changes.





THE HINDU



GS Paper 2-IR

Global intelligence chiefs converge in Delhi meet

Counterterrorism and intelligence-sharing systems among issues discussed at the conference, which is held a day before Raisina Dialogue; Tulsi Gabbard, Five Eyes chiefs among attendees

Dinakar Peri
NEW DELHI

Global challenges and intelligence-sharing mechanisms, as well as immigration and extradition, were among a host of issues discussed at the fourth conference of global intelligence and security chiefs hosted by National Security Adviser Ajit Doval on Sunday. The meeting had over 28 attendees, according to official sources.



Building ties: U.S. Director of National Intelligence Tulsi Gabbard met PM Modi last month during his visit to Washington DC. AFP

posted on X on March 1 before beginning her trip.

The chiefs of the Five Eyes countries, comprising Australia, Canada, New Zealand, the United Kingdom, and the U.S., were all present, though it was not clear if a separate meeting of the Five Eyes chiefs with Mr. Doval was in the offing.

The visit of Canadian spy chief Daniel Rogers has come as India looks to reset its ties with Ottawa after a deep freeze in bilateral relationship over Hardeep Singh Nijjar murder case.

KEY POINTS

The fourth conference of global intelligence and security chiefs, hosted by Ajit Doval, focused on counterterrorism, global security, and intelligence-sharing. Over 28 attendees, including representatives from 20 countries, participated. The conference was organized by RAW and the National Security Council Secretariat.





THE HINDU



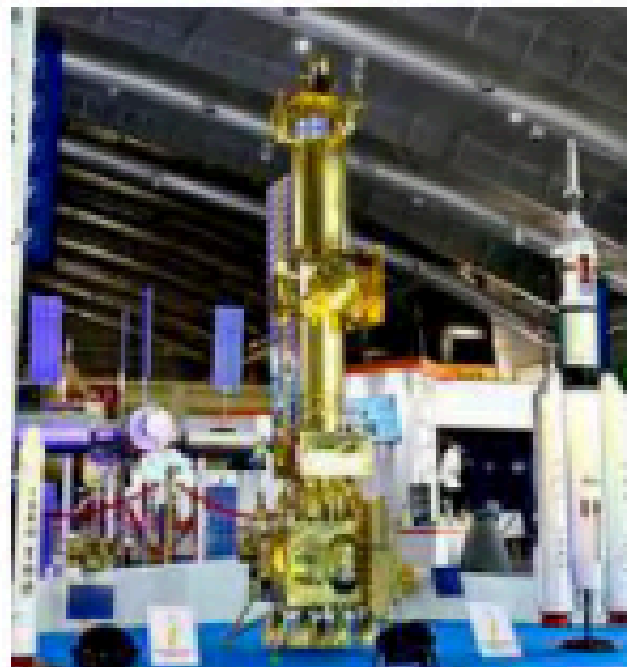
GS Paper 3-Space

Chandrayaan-5 has received Centre's approval, will carry 250-kg rover, says ISRO chief

Press Trust of India
CHENNAI

The Centre recently accorded approval for the ambitious Chandrayaan-5 mission to study the moon, Indian Space Research Organisation Chairman V. Narayanan said on Sunday.

At an event to felicitate



of Department of Space, said. Chandrayaan-3 Mission is a follow-on mission to Chandrayaan-2 to demonstrate end-to-end capability in safe landing and roving on the lunar surface.

Chandrayaan-3 success
ISRO successfully launched

KEY POINTS

The Centre has approved the Chandrayaan-5 mission, which will carry a 250-kg rover to study the Moon's surface. Unlike the Chandrayaan-3 mission, it will be conducted in collaboration with Japan. Previous missions, including Chandrayaan-1 (2008) and Chandrayaan-2 (2019), have contributed significantly to lunar exploration.

Chandrayaan-3 successfully landed on the Moon's South pole in 2023. The Chandrayaan-4 mission in 2027 aims to bring back Moon samples.





THE HINDU



GS Paper 2-IR

India, New Zealand resume trade deal talks after decade

The FTA negotiations aim to achieve balanced outcomes that enhance supply chain integration and improve market access, says Commerce Ministry after a meeting between Goyal and McClay

Press Trust of India
NEW DELHI

After a gap of about 10 years, India and New Zealand on Sunday announced resumption of negotiations for a proposed free trade agreement (FTA) to boost economic ties.

India and New Zealand began negotiating the Comprehensive Economic Cooperation Agreement (CECA) in April 2010 to boost trade in goods, services, and investment. However, after 10 rounds of discussions, the talks



Deep dive: Commerce Minister Piyush Goyal with New Zealand Trade Minister Todd McClay in New Delhi on Sunday. ANI

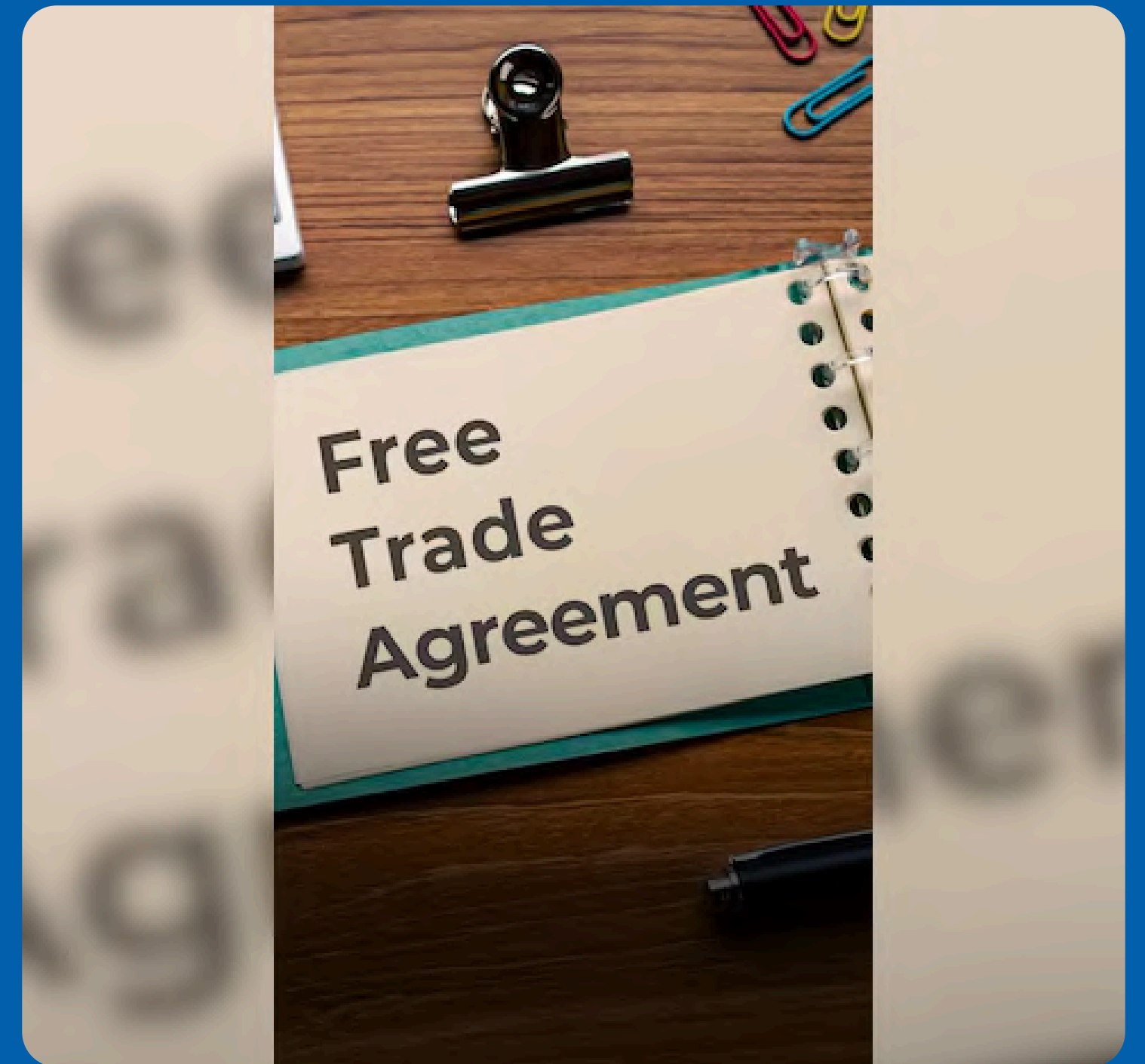
FTA less attractive for India. "As talks resume, both countries will need to find common ground on these issues to move forward successfully," GTRI founder Ajay Srivastava said.

He said earlier New Zealand was demanding greater access to India's dairy market, which India resisted to protect its domestic dairy industry that supports millions of farmers.

Currently, India's dairy imports from New Zealand are minimal (around \$0.57 million), and while India may consider limited imports of value-added dairy

KEY POINTS

India and New Zealand have resumed Free Trade Agreement (FTA) talks after a 10-year break, aiming to boost trade and market access. Key challenges include tariff disparities, with India's tariffs higher, and issues around dairy imports and IT sector access. Bilateral trade is expected to surpass USD 1 billion by 2025.





THE HINDU



GS Paper 3-Environment

Air pollution will lower India's solar generation capacity: study

Solar cells perform best under bright sunlight. They also need lower ambient temperature and airflow over them for cooling. Any imbalance in these factors lowers solar cell performance. Researchers have found that solar radiation was the main factor affecting solar-cell efficiency, followed by temperature.

Unnat Ashar

A study by researchers at IIT Delhi has found that air pollution and climate change will impair solar panel performance in India. It was published in *Environmental Research Letters* in November 2024.

According to the paper, India is the fifth-largest solar power producer worldwide. The country has set a target to produce 50% of its electric power from non-fossil fuel sources by 2030, and plans to install 500 GW of renewable energy capacity to this end by then. One-fifth of this capacity is expected to be in the form of solar power.

India also has plans to develop more solar parks and promote rooftop solar generation.

Solar power and climate

Like other forms of renewable energy sources, solar photovoltaic energy is at the mercy of weather and climate.

"Accurately assessing future renewable energy resources, particularly solar energy in India, where solar deployment is expanding rapidly, is crucial for ensuring a sustainable and resilient energy future," Sushovan Ghosh, lead author of the new study, then at the Centre for Atmospheric Sciences at IIT Delhi and now a researcher in the Earth Sciences Department of the Barcelona Supercomputing Centre, said.



Workers install solar panels at the Adani Group-owned Renuka Renewable Energy Park in Renuka, Gujarat, Nov.

Data from CESSES

The team's study used data from 1985 to 2014 to predict changes from 2014 to 2150, the middle of the current century. "Given that photovoltaic power plants generally have a lifespan of 20 to 25 years, analysing the 2014s aligns well with the operational lifetime of existing and planned installations," according to Ghosh. "Beyond this period, the analysis may lose practical relevance."



Studies of this kind give impetus to innovations that mitigate greenhouse gas emissions through the exploration of viable energy alternatives and, more importantly, improvements in photovoltaic cell design.

temperature due to solar exposure," Ghosh said.

The researchers also revealed that some parts of India's northeast as well as Kerala will develop higher solar power potential in time. "This is really interesting. ... This is because the cloud fractions are expected to decrease over these regions," Ghosh said.

According to the paper, the models can help the government and industry players

THE GIST

India has 300 sunny days a year, but their quality is declining due to air pollution. Solar radiation at the earth's surface is not stable over time but undergoes significant long-term variations, referred to as global dimming and brightening.

Air quality variations depend on clouds, aerosols, particulate matter, water vapour and radiatively active gas molecules such as ozone. On a cloudy or hazy day, due to particulate matter, less solar radiation will impinge on the panel and affect generation.

The study used data from 1985 to 2014 to predict changes from 2014 to 2150. Given that photovoltaic power plants generally have a lifespan of 20 to 25 years, analysing the 2014s aligns well with the operational lifetime of installations.

The research concluded that by mid-century, the efficiency of solar panels will drop by 1.1% under the worst-case



KEY POINTS

A study by IIT Delhi (Nov 2024) shows that air pollution and climate change will lower solar panel efficiency in India, potentially reducing it by 2.3% by mid-century. This could result in a loss of 840 gigawatt-hours annually. The study stresses the need for emissions reduction and improved air quality to maximize solar energy potential. charge on 82 tariff lines that are subject to cess



The Indian **EXPRESS**

GS Paper 1-History

MENHIR

Large standing or upright stones sculpted by early humans, found at sites around the world

EXPRESS NEWS SERVICE
NEW DELHI, MARCH 16

THE MUDUMAL megalithic menhirs in Telangana's Narayanpet district are set to be the second UNESCO World Heritage Site in the state, and one of the six Indian sites to be added to the tentative list by the World Heritage Centre in 2025.

What are menhirs?

A menhir is a standing or an upright stone usually tapered at the top. It is man-made, in that it is sculpted and placed by humans, and usually quite large — the largest surviving menhir, the Grand Menhir I in France's Carnac megalithic site, is 20 metres tall.



Mudumal megalithic menhirs in Telangana. X/@MinOfCultureGov

KEY POINTS

1. The Mudumal megalithic menhirs in Telangana will soon be India's second UNESCO World Heritage Site. These ancient, upright stones, dating back 3,500 to 4,000 years, are believed to serve ceremonial and astronomical purposes. The site includes the oldest known menhirs in India, some aligned with solstices, and one is worshipped as Goddess Yellamma. Their recognition highlights early human knowledge in physics, astronomy, and culture.

