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What we UnderStand, We Conquer

CURRENTLY – 21st July 2026

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4 Indian seafarers killed near Odessa

Kallol Bhattacherjee
NEW DELHI

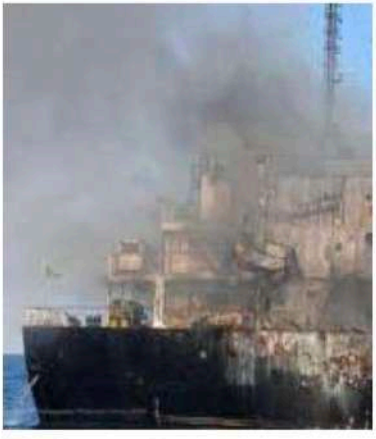
Four Indian citizens were killed and one was critically injured in an attack on a merchant vessel near the Ukrainian port of Odessa on Sunday. India condemned the incident and called such attacks impeding freedom of navigation "deplorable".

The Ministry of External Affairs on Monday reiterated India's opposition to attacks on merchant vessels as such incidents violate the freedom of navigation.

First instance

The incident near Ukraine's largest sea port in the Black Sea is the first instance of Indian seafarers being killed in the Russia-Ukraine war that started in February 2022.

Ukraine's Acting Foreign Minister, Andrii Sybiha, has blamed Russia for the attack and said five crew members of the ship remain missing.



Smoke rises from the vessel *MV Golden Leo* after an alleged Russian attack on Sunday. AFP

"On the evening of 19 July 2026, the vessel *MV Golden Leo* was attacked while departing the port of Odessa. At the time of the incident, there were 17 crew members on board, including five Indian nationals. As per information available, four Indian nationals have tragically lost their lives, while one is hospitalised in a critical condition," read a statement from the Ministry of External Affairs.

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Belarus
Russia
Media reports of Russian troops crossing from Belarus into Ukraine
Warsaw
Poland
Separatist-claimed areas
Kyiv
Krakow
Lviv
Kharkiv
Ivano-Frankivsk
Ukraine
Slovakia
Luhansk
Dnipro
Donetsk
Moldova
Chisinau
Rostov
Hungary
Mariupol
Romania
Odessa
Separatist-held areas
Krasnodar
Bucharest
Key
: Media reports of missile strikes
Russian troops arrive in port cities of Odessa and Mariupol, according to Interfax Ukraine

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1. Context (Places in News)

I. Four Indian seafarers were killed and one was critically injured after the merchant vessel MV Golden Leo was attacked near Odessa Port on Ukraine's Black Sea coast.

II. India condemned the attack, stating that attacks on merchant vessels violate the freedom of navigation.

2. Odessa Port

I. Located on the northwestern coast of the Black Sea in southern Ukraine.

II. Ukraine's largest seaport and the country's principal maritime trade gateway.

III. Major export hub for grain, sunflower oil, metals, and other commodities.

IV. Strategically significant in the Russia–Ukraine war and was central to the Black Sea Grain Initiative (2022–23).

India approves first dengue vaccine for persons aged 4-60

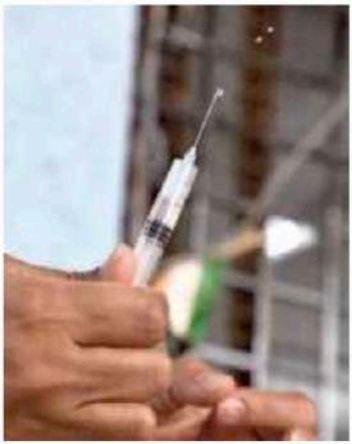
The Hindu Bureau
CHENNAI

The Drug Controller General of India (DCGI) has granted market authorisation to Takeda Biopharmaceuticals India's QDENGA (TAK-003), making it the first dengue vaccine to be approved in the country, according to a press release from the company.

The vaccine has been approved for the prevention of dengue in individuals aged four to 60. QDENGA is a live-attenuated tetravalent vaccine designed to provide protection against all four dengue virus serotypes and is administered as a two-dose regimen, with doses given three months apart.

According to the company, the vaccine can be administered irrespective of whether an individual has had a previous dengue infection, and does not require pre-vaccination screening.

The approval comes as dengue continues to pose a significant public health challenge in India, where reported cases have increased nearly 11-fold over the past two decades. India accounts for nearly one-third of the global dengue burden, although modelling studies suggest the actual number of infections is substantially higher than reported.



India accounts for one-third of the global dengue burden.

Clinical trials

The approval is based on Takeda's global clinical development programme comprising 19 Phase I, II and III clinical trials involving over 28,000 participants in dengue-endemic and non-endemic regions.

The company's pivotal Phase III trial enrolled more than 20,000 participants across eight dengue-endemic countries.

According to Takeda, the vaccine demonstrated an efficacy of 80.2% against virologically confirmed dengue 12 months after the second dose, and 90.4% efficacy against dengue-related hospitalisation at 18 months.

The approval in India was also supported by a Phase III clinical trial conducted among participants aged 4 to 60 years. The company said the study found the vaccine to be safe, well tolerated and immunogenic in children, adolescents and adults.

Takeda said QDENGA has been approved in 43 countries across Asia, Latin America and Europe, with more than 32 million doses distributed through public and private immunisation programmes.

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1. Context (GS II – Health)
I. The Drug Controller General of India (DCGI) has granted market authorisation to QDENGA (TAK-003), making it India's first approved dengue vaccine for individuals aged 4–60 years.
II. The vaccine can be administered irrespective of prior dengue infection and does not require pre-vaccination screening.

2. QDENGA Vaccine
I. Developed by Takeda Biopharmaceuticals.
II. A live-attenuated tetravalent vaccine that provides protection against all four dengue virus serotypes (DENV-1, DENV-2, DENV-3 and DENV-4).
III. Administered as a two-dose regimen, with doses given three months apart.
IV. Approved for use in 43 countries and supported by Phase III clinical trial data.

3. Dengue
I. A viral disease caused by the dengue virus and transmitted by the female Aedes aegypti mosquito (also Aedes albopictus).
II. Symptoms include high fever, severe headache, muscle and joint pain, skin rash, and in severe cases dengue haemorrhagic fever or dengue shock syndrome.
III. There is no specific antiviral treatment; management is mainly supportive with early diagnosis and adequate fluid therapy.
IV. Prevention focuses on vector control, elimination of mosquito breeding sites, and protection against mosquito bites.

India's green transition is missing long-duration energy storage

Longer-term energy storage is needed to ensure that the grid remains reliable during prolonged periods of low solar and wind generation; the longer the time over which a technology discharges energy, the better its economics; at the same time, storing more energy is also expensive

Aedna Kurian
Ammu Susanna Jacob

On May 21, India recorded its highest peak demand of 270.8 gigawatt (GW) during the day, an increase of approximately 90 GW from the same window in 2019. While power generators often meet India's summer peak, the demand again increases at night, especially due to the use of air conditioners. This underscores the need for longer-term energy storage to ensure the grid remains reliable during prolonged periods of low solar and wind generation.

India's current energy storage roadmap only offers a partial solution. The 2026 Long-Term National Resource Adequacy Plan envisages 80 GW of battery energy storage and 94 GW of pumped hydroelectric energy storage (PHES) by FY2035-36. This translates to average discharge durations of roughly 4 and 6 hours, respectively.

This could be enough to address short-term fluctuations but may not suffice during adverse weather conditions, such as heatwaves.

In this context, long-duration energy storage (LDES) technologies, which are capable of delivering power for days rather than hours, could turn out to be the missing pillar of India's green energy transition.

A pumped hydroelectric storage power plant in Tasmania. The plant stores electricity by pumping water uphill when power is abundant. Later, the water flows downhill through turbines, generating electricity during periods of high demand. GETTY IMAGES

Diverse landscape

LDES refers to technologies that store energy and discharge it as power or thermal energy over extended periods, from 8 hours to days, weeks, or seasons. By storing energy when renewable generation is abundant and supplying it during periods of peak demand or low generation, LDES can provide the reliability and flexibility to support a renewable-heavy grid.

Further, unlike short-duration energy storage systems, which discharge energy for less than 8 hours and smooth intra-day demand fluctuations, LDES provides the endurance needed to balance supply and demand for prolonged periods, ease grid congestion, and provide grid resilience and stability.

Several LDES technologies are available today, each at different stages of development and commercial readiness, including PHES, compressed-air energy storage (CAES), thermal storage, hydrogen-based storage, and flow batteries.

Of these, PHES remains the benchmark because of its mature infrastructure and a high energy efficiency of 70-80%. CAES has a similar level of market readiness but a slightly lower efficiency of 40-70%. Thermal storage stands out for its long discharge duration – around 200 hours – and an energy efficiency of 55-90%. However, researchers are still developing it.

Costs of long-term storage

Although chemical energy storage, such as with hydrogen, has even higher discharge durations of up to 1,000 hours, it is not efficient. Vanadium flow batteries – an example of electrochemical energy storage – are commercially ready, come in different sizes, and have an efficiency of 80-85% across durations of 10-24 hours.

Scientists are also working on more cutting-edge solutions like iron-air batteries. In all, the LDES landscape is diverse and worth looking forward to.

The longer the time over which a technology discharges energy, the better its economics. At the same time, storing more energy also costs more. So for discharge durations beyond six hours, short-duration energy storage systems are unlikely to prove cost-effective.

The LDES Council is an international body that brings together industry leaders, technology developers, investors, policymakers, and other stakeholders to accelerate the innovation and commercialisation of LDES technologies. It has projected a significant decrease in LDES costs by 2030, making it an economically feasible storage solution.

According to a study by Pacific Northwest National Laboratory, a research body under the U.S. Department of Energy, PHES and CAES are the most cost-effective and commercially viable technologies at present, at $0.12/kWh and $0.10/kWh, respectively.

However, both technologies need specific site conditions. PHES requires two water reservoirs at different heights so that water can be pumped to the upper reservoir when surplus electricity is available and released downhill to generate power when needed. Thus, the site must have enough land for the reservoirs, an optimal height difference for the water to flow down with force, and of course water.

Likewise, CAES needs large underground spaces, such as salt caverns or depleted gas fields, that can safely hold high-pressure air without major leaks.

Where such sites are not available, other LDES options, such as hydrogen, thermal storage or vanadium flow batteries – which depend less on specific land, water, and subterranean conditions, may be more suitable.

India's position on LDES

The California Public Utilities Commission, California's primary utility regulator responsible for overseeing electricity, natural gas, telecommunications, and other public utility services, has set an LDES procurement target of 2 GW. It has said this capacity will be deployed between 2031 and 2037.

Long-duration energy storage (LDES) technologies, which are capable of delivering power for days rather than hours, could turn out to be the missing pillar of India's green energy transition

Similarly, to unlock investments and accelerate deployment, the U.K. has launched a financial framework for LDES that provides a safety net for investors. Among other measures, it will ensure LDES projects have a minimum revenue, even in poor market conditions.

Per a 2026 report by the Central Electricity Authority, India's PHES potential is about 267 GW. The report also said India plans to install PHES projects with an aggregate capacity of 100.8 GW by 2035-2036. Of this, 11.6 GW is currently under construction.

In early 2025, India also launched a 160-MWh carbon dioxide battery storage system at the National Thermal Power Corporation (NTPC) in Kudgi, Karnataka. It works by cycling carbon dioxide between liquid and gas phases and has an operational life exceeding 25 years. This was followed by inaugurating the country's first MWh-scale vanadium redox flow battery system – a 3-MWh facility installation at NTPC in Greater Noida.

Proposed roadmap

While the Long-Term National Resource Adequacy Plan acknowledges the role of energy storage in maintaining power grid reliability, it does not specifically recognise the need for LDES.

To address this gap, LDES should be incorporated into the Ministry of Power's National Framework for Promoting Energy Storage Systems, accompanied by guidelines on its deployment and integration into grid operations.

Similarly, while the National Electricity Plan outlines projected capacities for battery ESS and PHES, it does not provide technology-specific assessments or deployment pathways for LDES.

Given the growing importance of LDES in a renewable-rich power system, future planning exercises should include estimates of LDES requirements and identify technologies best suited to India's extreme weather and geographical conditions.

Faster environmental and land clearances, transmission alignment, and clear regulatory classification are also important to unlock investments.

The incentive structure, including subsidies and viability-gap funding, must be technology-agnostic and incentivise co-location opportunities with data centres. As the market matures, the focus must shift to long-term revenue contracts, tariff structures, and procurement frameworks.

Intense efforts should be made to build awareness among all stakeholders of the available LDES solutions, and their grid use cases should be presented. As part of this effort, dispatch centres should be directed to post staff for skill enhancement and training to support optimal dispatch, multi-day charge-discharge decisions, state-of-charge management across seasons, and coordination across storage assets with proper guidelines and protocols for LDES.

Without planning to include LDES, however, India's clean energy future could be forced to rest on favourable weather and market conditions.

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1. Context (GS III – Environment & Energy)

I. India's electricity demand is increasing rapidly, with peak demand reaching a record 270.8 GW in May 2026, while the growing share of renewable energy requires reliable storage to ensure uninterrupted power supply.

II. India's current storage roadmap envisages 80 GW of Battery Energy Storage Systems (BESS) and 94 GW of Pumped Hydro Energy Storage (PHES) by 2035–36, but much of this capacity is designed for short-duration storage.

2. Core Arguments

I. Long-Duration Energy Storage (LDES), capable of supplying electricity for days rather than hours, is essential to ensure grid reliability during prolonged periods of low solar and wind generation.

II. Excess dependence on short-duration storage may be inadequate to address seasonal variations, extreme weather events and future renewable energy integration.

III. India needs a diversified portfolio of storage technologies, including PHES, Compressed Air Energy Storage (CAES), thermal energy storage, hydrogen storage and flow batteries, based on technical and geographical suitability.

IV. The absence of a dedicated policy, market incentives and deployment roadmap for LDES could become a major bottleneck in India's clean energy transition.

3. Way Forward

I. Integrate LDES into national energy planning with clear deployment targets and regulatory support.

II. Promote research, innovation, pilot projects and domestic manufacturing of advanced storage technologies.

III. Develop long-term market mechanisms, viability gap funding and investment incentives to attract private participation.

IV. Strengthen grid planning by incorporating LDES to improve energy security, renewable energy integration and climate resilience.

Canada-India defence collaboration for a secure future

Chris Cooter

High Commissioner for Canada to India

Canada is seeing an historic shift for our country – one that opens new opportunities for relations between Canada and India. Speaking at CANSEC 2026, Canada's leading defence, security and emerging technology event, on May 27, 2026, Prime Minister Mark Carney said: "The very nature of war is rapidly evolving, driven by the proliferation of drones, autonomous systems, and weapons in orbit. Conflicts could emerge closer to our borders than before, and new weapons are reducing the distance that separates us from them. The world has changed, and Canada must change with it. That is why, six weeks after forming the government, we announced our ambitious plan to rebuild, rearm, and reinvest in the Canadian Armed Forces."

This is at a time when the world is changing, and Canada-India defence collaboration can translate into a strategy for a secure future.

The good news is that we are already walking on this path. In 2025, Mr. Carney announced that Canada is on track to spend 5% of its GDP on defence by 2035. In March, we already surpassed 2% of the GDP, placing Canada among one of the 10 largest economies in the world.

As Mr. Carney said during his speech in January 2026 at the World Economic Forum's Annual Meeting in Davos, there has been a rupture in the world order. Or as Prime Minister Narendra Modi has said, we are living through a decade of crisis.

Bilateral defence engagement

In this changing world, defence cooperation between Canada and India has become crucial and we have already taken steps to bolster it.

Most recently, we accredited Defence Advisers in both Ottawa and Delhi. Mr. Carney and Mr. Modi agreed to establish a Defence Dialogue to prioritise cooperation on shared interests and align capacities. Canadian and Indian navies participated in the Rim of the Pacific exercises and Talisman Sabre exercises. In June this year, a delegation from India's National Defence College visited Canada. This will allow Indian officers to have direct exchanges with military colleges and bases in Canada.

We have established a national Defence Investment Agency to streamline military procurement. We have also launched a defence Industrial Strategy to diversify supply chains so Canada does not rely on just one country. That is why we are calling on natural partners such as India to participate in co-development, subsystem manufacturing, and sustainment. We are investing in innovation, including through a half billion-dollar investment in next generation aerospace technologies, including a drone innovation hub.

Shared interests drive Canada and India toward a stronger strategic defence partnership

Strategic technology cooperation

Canada's strengths in advanced technologies can complement India's scale, manufacturing capacity, and expanding industrial base. Canada is one of only a few countries with a full-spectrum aerospace sector, while India's domestic aviation industry is the third largest domestic market in the world. Canada is a research and development powerhouse, while India is focused on advancing innovation capacity and high-end manufacturing.

Canada and India are part of a small group of countries with advanced space capabilities. The importance of civilian space cooperation was highlighted in the joint statement between our two Prime Ministers. Canada's strengths in advanced components for satellite technology and space robotics can complement India's strengths in low-cost platforms. Canada's RADARSAT constellation system can have application in meeting India's aim of advancing its naval capacity in the region. Critical minerals are the building block of defence technologies – another area where Canada and India can expand their partnership. Amid the crisis in West Asia, national security and economic security are inextricably linked. Here, a critical partnership between Canada and India can take shape.

Canada has vast geological reserves of 31 critical minerals from cobalt to helium. Canada holds the tenth largest reserves of rare earth elements; the third largest recoverable resources of uranium; and 5% of the world's tungsten reserves. Additionally, Canada is the second largest producer and exporter of uranium globally, with 24% of global production in 2024. Canada has embarked on a strategy to diversify its trusted partners. For India, there is a need for reliable partners such as Canada to reach its own economic and national security goals. The Canada-India memorandum of understanding on Critical Minerals Value Chain, signed during Mr. Carney's visit to India in February-March 2026, laid the groundwork for the integration of stable, resilient supply chains between the two countries.

Building on shared legacy

As we look forward, it is worth recalling our shared history and common sacrifice. Recently, I visited the Kirkee War Cemetery in Pune where members of the Royal Canadian Air Force killed during the Second World War were laid to rest. As I walked through the memorial site, I was reminded that our countries have stood shoulder to shoulder in the past, not just on the battlefield but for common causes and for the shared security of our countries. Let us continue that long-standing tradition as we reshape the defence cooperation between our two countries.

1. Context (GS II – International Relations)

I. India and Canada are witnessing renewed momentum in bilateral relations, with both countries expanding cooperation in defence, critical minerals, advanced technologies and resilient supply chains amid a changing global security landscape.

II. Recent initiatives include:

- India–Canada Defence Dialogue – An institutional mechanism for regular consultations on defence and strategic cooperation.
- Critical Minerals Value Chain MoU (2026) – To strengthen cooperation in the exploration, processing and resilient supply chains of critical minerals.
- Maritime, Aerospace and Space Cooperation – Focuses on joint research, technology collaboration, industrial partnerships and capacity building.

2. Core Arguments

I. India and Canada should move beyond traditional defence engagement towards co-development, co-production, technology transfer and defence industrial collaboration.

II. Canada's strengths in advanced research, aerospace and critical minerals complement India's manufacturing capabilities and Aatmanirbhar Bharat initiative.

III. Cooperation in artificial intelligence, cyber security, drones, space technologies and maritime security can strengthen strategic resilience and Indo-Pacific security.

IV. Trusted supply chains for critical minerals are essential for defence manufacturing, clean energy technologies and long-term economic security.

Core sectors grow at five-month high of 5%

T.C.A. Sharad Raghavan
NEW DELHI

India's core industrial sectors grew at 5% in June 2026, the fastest in five months, as per the inaugural release of the new and updated series of the Index of Core Industries (ICI).

The Ministry of Commerce and Industry on Monday released the new series of the ICI, with an updated base year of 2022-23 from the earlier 2011-12. Further, the updated index has an additional sector of iron ore added to it, taking the total number of sectors it covers to nine. The sectoral weights and methods of estimation have also been updated.

Within the index, the fastest growth was recorded by iron ore, which grew 43.9% in June 2026 against 19% in May.

This growth, however, was likely due to a statistical base effect, since the sector contracted 16.4% in June last year. Electricity, cement, steel, and coal grew 9.8%, 9.8%, 4.6% and 1.4% respectively.

The Index of Core Industries last grew faster in January 2026 when it hit a growth of 5.2%, as per the new series. "Owing to intensive use of iron ore in the production process, and its contribution to industrial development, it has been included in the list of core industries as a new item in the revised series of ICI (base year 2022-23)," the Ministry said in a statement.

Nearly all the sectors relating to hydrocarbon energy and its products, such as crude oil (-4.2%), natural gas (-7.4%), refinery products (-4.7%), and fertilisers (-3.3%) contracted in June 2026.

"The entire crude oil related sectors – crude oil, gas, refinery products and fertilizers – witnessed negative growth in June which can be attributed to higher imports with global crude prices cooling off," Madan Sabnavis, chief economist at the Bank of Baroda said. "The export of refinery products had slowed down this month. In case of fertilizers, imports tended to increase."

The only energy sector to have witnessed growth was The coal sector which grew 1.4% in June 2025, snapping a three-month streak of contraction.

1. Context (GS III – Economy)

I. India's Index of Core Industries (ICI) grew 5% (YoY) in June 2026, the highest growth in five months.

II. The revised ICI series (Base Year: 2022–23) updates the methodology and includes Iron Ore as the 9th core industry.

2. Index of Core Industries (ICI)

I. Released by: Office of the Economic Adviser (OEA), Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce & Industry.

II. Measures the performance of the country's core industries, which form the backbone of industrial production.

III. Core industries: Coal, Crude Oil, Natural Gas, Refinery Products, Fertilisers, Steel, Cement, Electricity and Iron Ore (added in the revised series; earlier there were eight core industries).

IV. Base Year: Revised from 2011–12 to 2022–23, with updated sectoral weights and methodology.

3. ICI and IIP

I. ICI is a leading indicator of industrial activity and constitutes about 40% of the weight of the Index of Industrial Production (IIP).

II. Index of Industrial Production (IIP) is released by the National Statistics Office (NSO), Ministry of Statistics and Programme Implementation (MoSPI) and measures the performance of the Mining, Manufacturing and Electricity sectors.

Bengaluru to host India-U.S. space group meet in August

The Hindu Bureau
BENGALURU

Experts from the two countries will hold bilateral talks, says U.S. Public Diplomacy Officer

The next meeting of India-U.S. Civil Space Joint Working Group (CSJWG) will be held in Bengaluru in August.

Eric Atkins, Public Diplomacy Officer, U.S. Consulate General, said on Monday that the CSJWG experts from the U.S. and India would hold bilateral talks at the meetings.

"The very next collaboration on the calendar is the next meeting of the CSJWG, which is being held here in Bengaluru. A bilateral meeting of experts from the U.S. and India will be held in the first week of August," he said.

The CSJWG was established in 2005 and over the years, officials from the Indian Space Research Organisation (ISRO) and experts from other Indian government agencies have held discussions with the NASA and the U.S. government agencies.

The two countries have had a strong bilateral cooperation in space and collaborated on various space programmes, including the NASA-ISRO Synthetic Aperture Radar (NISAR) mission which was launched in 2025.

Meanwhile, Swati Mohan, space scientist and project manager for AstroNav at NASA Jet Propulsion Laboratory who is on a visit to Bengaluru, during an interaction with media, highlighted the achievements of the Mars 2020 Perseverance Rover.

"The Perseverace Rover has had a phenomenal run, its prime mission was designed for about three Earth years which it has exceeded... Its primary objective is to collect samples that could hold the science of past life on Mars, and it has done that successfully," Dr. Mohan said.

1. Context (GS II – IR | GS III – Space)

I. Bengaluru will host the next meeting of the India–U.S. Civil Space Joint Working Group (CSJWG) in August 2026, where experts from ISRO, NASA and other government agencies will discuss bilateral cooperation in civil space activities.

II. The meeting aims to deepen collaboration in space exploration, Earth observation, satellite applications and emerging space technologies, building on the growing India–U.S. strategic partnership.

2. India–U.S. Civil Space Joint Working Group (CSJWG)

I. Established: 2005 as the institutional mechanism for civil space cooperation between India and the United States.

II. Participants: Led by ISRO, NASA and other government agencies from both countries.

III. Objective: Promote collaboration in space science, Earth observation, satellite navigation, planetary exploration, human spaceflight and capacity building.

IV. Key Outcome: It has facilitated several joint initiatives, including the NASA–ISRO Synthetic Aperture Radar (NISAR) mission, launched in 2025, for advanced Earth observation and disaster management.

3. Significance

I. Strengthens the India–U.S. Comprehensive Global Strategic Partnership in the space sector.

II. Enhances cooperation in space technology, scientific research, climate monitoring and disaster resilience while supporting India's expanding space ecosystem.