Topic → Mapping

- **Ben Gurion International Airport, commonly known by the Hebrew-language acronym Natbag, is the main international airport of Israel.**
- **Situated on outskirts north of the city of Lod and directly south of the city of Or Yehuda, it is the busiest airport in the country**

Israel vows 'multi-phased' response after Houthi missile strike on Ben-Gurion airport wounds six

Agence France-Presse
Associated Press
TEL AVIV

A missile struck inside the perimeter of Israel's main airport on Sunday, wounding six persons, halting flights, and gouging a wide crater, in an attack claimed by Yemen's Iran-backed Houthi rebels.

The attack on Ben-Gurion International Airport came hours before top Israeli Cabinet Ministers were set to vote on whether to intensify the country's military operations in the Gaza Strip. The Army, meanwhile, began calling up thousands of reserves in anticipation of a wider operation on Gaza, officials said.

Israeli Prime Minister Benjamin Netanyahu promised a multi-phased response. "We have acted against them in the past and we will act in the future, but I cannot go into detail (...) it will not happen in one bang, but there will be many bangs," Mr. Netanyahu said in a video.

Defence Minister Israel Katz vowed retribution: "Whoever harms us, we will harm them sevenfold."

The Israeli military said "several attempts were made to intercept" the missile launched from Yemen, a rare Houthi attack that penetrated Israel's air defences.

The missile hit near the parking lots of Terminal 3, the airport's largest. The crater was just hundreds of metres from the tarmac.

Cordoned off: Security forces inspect the site where the Israeli military said a projectile landed near Tel Aviv on Sunday. AP

Flight diverted

An Air India flight from New Delhi to Tel Aviv was diverted to Abu Dhabi following the attack. The airline suspended Tel Aviv flights till Tuesday. The attack came less than an hour before the aircraft (flight no. AI139) was to land at Tel Aviv.

Fragments of missiles or interceptors have struck near the airport before, but this appeared to be the first time a missile struck the airport since the war began.

The police said that air, road, and rail traffic were halted following the attack. The traffic resumed after about an hour, Israel Airports Authority said. Flights resumed later with the aviation authority saying the airport was now "open and operational".

Israel's Magen David Adom emergency service said it had treated at least six persons with light to moderate injuries.

Houthi military spokesperson Brig. Gen. Yahya Saree said in a video statement that the group had fired a hypersonic ballistic missile.

Houthi rebels have been firing at Israel since the war on Gaza erupted on October 7, 2023, and the missiles have mostly been intercepted, though some have penetrated Israel's missile defence systems.

Israel has struck back against the rebels in Yemen and the U.S., Israel's top ally, also launched a campaign of strikes in March against them.

Topic - Angola mineral resources(Geography)

Angola invites Indian businesses to explore opportunities in export

Press Trust of India
NEW DELHI

Angola President Joao Manuel Goncalves Lourenco on Sunday invited Indian businesses to explore opportunities that can place the African nation at the centre of their export strategies, highlighting areas for mutual cooperation, including agriculture, pharmaceutical and renewable energy.

Mr. Lourenco, currently on a visit to India, highlighted Angola's strategic location with privileged access to regional markets through the Southern African Development Community (SADC) and the African Continental Free Trade Area (AfCFTA).

He was addressing the India-Angola Business Forum here.

"The relationship between Angola and India is built on a solid legal and institutional foundation, developed over decades of cooperation. The existing bilateral agreements – in areas such as health, energy, financial services, and diplomatic mobility – reflect both countries' commitment to a structured, transparent, and mutually beneficial partnership," Mr. Lourenco said.

Union Minister J.P. Nadda meets Angola President Joao Manuel Goncalves Lourenco in New Delhi on Sunday. ANI

"We invite Indian entrepreneurs to explore these logistical opportunities that can place Angola at the centre of their export strategies – both for Africa and the wider world," the President said.

He went on to talk about the various sectors for cooperation, which includes the pharmaceutical industry, agriculture sector, and renewable energy sector.

"We firmly believe that this transformation will only be truly sustainable if it is supported by strong, fair, and innovative partnerships. Without doubt, India's business dynamism, technological excellence, and capacity for innovation are qualities that Angola deeply values and with which we wish to walk side by side," he said.

Kirti Vardhan Singh, Minister of State for External Affairs and Environment, Forest & Climate Change said, "Looking ahead, there are several priority sectors where we can deepen collaboration. In the energy sector, we can develop oil and gas infrastructure and partner on clean energy. In the field of education and skilling, India can play an important role in education and capacity building." CII president Sanjiv Puri said.

"Angola has a very strong mining sector and the third largest diamond production in Africa. The country also possesses repositories of critical minerals. I truly believe that joint exploration in diamond processing and other critical minerals would develop a critical minerals value chain," he added.

Angola is rich in a variety of mineral resources, many of which are underexploited or just beginning to be developed. Here are the major mineral resources found in Angola:

1. Diamonds

- Angola is one of the top diamond producers in the world.
- Most diamond mining is concentrated in the Lunda Norte and Lunda Sul provinces.
- Diamonds are mostly mined through alluvial (riverbed) and kimberlite (volcanic pipe) methods.
- Key operators include Catoca, one of the largest kimberlite diamond mines in the world.

2. Oil and Natural Gas

- Angola is a major oil producer in Africa, second only to Nigeria.
- Offshore oil fields, especially in the Congo Basin and Kwanza Basin, are significant.
- Oil exports are the main source of government revenue.

3. Iron Ore

- Once a major exporter before the civil war, Angola has been revitalizing iron ore exploration.
- Notable iron ore reserves are located in Cassinga, in the south.

4. Gold

- Gold mining is increasing, especially in Huíla and Cabinda provinces.
- Angola has untapped potential for gold exploration.

5. Phosphates

- Large phosphate deposits are found in Cabinda.
- There is potential for fertilizer production and export.

6. Copper

- Copper deposits exist in the northwestern provinces.
- There is ongoing exploration, especially in areas bordering the DRC.

7. Other Minerals

- Manganese, gypsum, lead, zinc, granite, marble, and rare earth elements are also present.
- Angola has potential in lithium and cobalt, increasingly important for green energy technologies.

PIN(PERSON IN NEWS)

- ▢ Padma Shri awardee, spiritual guruand yoga practitioner Baba Sivanand, passed away in Varanasion Saturday night due to health complications

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Topic → Agriphotovoltaics, (GS PAPER 3- Agriculture + sci tech)

From ploughs to panels, cultivating a solar-powered future for farmers

With benefits for food and energy production, agriphotovoltaics promise a dual harvest as well as prosperity for India's smallholder farmers; what would complete the picture is probably official incentivisation through inclusion of APVs in the government's flagship scheme on agricultural solarisation and also in the policy framework

Subhodeep Basu
Laxmi Sharma

An experimental agriphotovoltaic setup at the University of Arizona. KILLAMATOR (CC BY-SA)

In 1981, German scientists Adolf Goetzberger and Armin Zastrow published a foundational paper arguing that dual land use for food and energy could bring significant benefits. They proposed elevating solar modules by about 2 m above the ground to allow crops to grow underneath, giving rise to the concept of agriphotovoltaics (APVs).

APVs integrate solar energy generation with agricultural production, offering a model that maximises land-use efficiency while augmenting farmers' income. With APVs, farmers will also be able to move energy back to the grid at a predetermined feed-in tariff, forging new streams of income alongside agricultural ones.

To accommodate APVs, the on-site solar infrastructure will have to be designed such that cultivation is possible between rows of solar panels, a.k.a. interspace orientation, and in the area available beneath the elevated panels, or overhead-stilted orientation.

There is a growing interest in APVs in India, but in practice it is mostly limited to demonstrative pilots by research institutes or private developer-owned and -managed APV systems.

A recent report by the Indian Council for Research on International Economic Relations (coauthored by the authors of this article) examined an APV system in Najafgarh, Delhi. A farmer had leased his land to solar energy company Sunmaster for 25 years to establish an APV facility.

Before the APV plant was operational, the farmer's net income was typically ₹41,000 per acre a year from traditional crops like wheat and mustard. After the APV was installed, the income included an annual rent of ₹1 lakh per acre. The returns from the crop cultivation and energy sales went to the developer. The farmer said this rent-based income was a stable alternative that kept him from worrying about uncertainties in agricultural yield.

The report also explored a hypothetical scenario in which a farmer, in addition to receiving lease income, had negotiated to receive the agricultural revenue as well. If the farmer cultivated high-value as well as shade-loving crops like potato, tomato, and turmeric, the income could have been up to Rs 1.5 lakh per acre a year from crop cultivation in addition to Rs 1 lakh per acre in rent – a sixfold increase in income over traditional open farming alone and a testament to APVs' potential to boost farmers' earnings.

Also, in addition to the apparent gains in land-use efficiency, APVs may also create favourable microclimatic conditions that reduce water loss from and heat stress on plants.

Need for standards

Unlike many other countries, India lacks standardised norms for APVs, creating ambiguity in project design. Countries leading in APV adoption, including Japan and Germany, could offer valuable lessons in this regard.

Japan requires all APV structures to be temporary and removable, a minimum panel height of 2 m, and a maximum crop yield loss of 20%. The Japanese government reviews projects for renewal every three years based on their effects on the agricultural output.

Likewise, Germany has introduced a standardised framework called DIN SPEC 91434, which requires all APV systems to maintain 66% of the original agricultural yield (called the reference yield) and limits the amount of arable land lost to solar infrastructure to up to 15%. The standard ensures agriculture remains the top priority of APV development – even if the energy returns are high.

India can draw on these examples to define its national APV guidelines, including specifications on panel height, permissible yield loss, and land-use criteria. Such guidelines will be key to keep energy management from overshadowing agricultural interest, especially at scale.

Smallholder inclusion

Most Indian farmers are smallholders, owning less than 2 ha of land each, and have limited purchasing power. Scaling APV for smallholders will require leveraging farmer institutions such as FPOs and cooperatives. Sahyadri, one of a few FPOs in India to install a 250-kW APV system, is cultivating high-value crops like grapes and citrus lemon under solar panels. It shows how institutions can help farmers pool resources and provide stronger market linkages.

Solar plants within KUSUM could consider implementing models with infrastructure that allows crops to be cultivated simultaneously. This will allow India to take advantage of existing policy platforms to test and accelerate innovation

Expanding institutional support – through grants or NABARD's credit guarantee for APV investments – can also lower financial barriers to smallholders.

Indeed, the primary bottleneck for APV adoption in India is the high capital expenditure required for APV systems. While a typical 1-MW ground-mounted solar plant in 5 acres of land would cost around Rs 2.7 crore, an APV system will incur an additional 11% due to the specialised infrastructure it requires. So without a remunerative feed-in tariff (FiT), the economic viability of APVs remains uncertain.

For instance, under the current FiT of ₹3.04/unit in Rajasthan's PM-KUSUM scheme, the payback period for a 1-MW ground-mounted solar plant will be 15 years.

But a higher FiT based on the thermal average power purchasing cost for the State Discoms of ₹4.52/unit, the payback period will drop to four years. Such attractive FiTs could incentivise farmers and investors to invest in APVs.

The government can also float capacity-building programmes that train and equip farmers with the expertise to manage APV systems.

Two pillars

India currently doesn't have any designated policy on agrivoltaics.

There is an opportunity, however: a revamp of the Government of India's flagship PM KUSUM scheme on agricultural solarisation to accommodate APVs in its delivery system could help scale the innovation across the country.

Solar power plants as commissioned within the grid-connected components of the scheme could also consider implementing models with infrastructure that allows crops to be cultivated simultaneously.

This will allow India to take advantage of existing policy platforms to test and accelerate innovation.

Success in the long run, however, still depends on two pillars: strong economic incentives for investors and a robust, farmer-centric policy framework.

(Subhodeep Basu is research fellow and Laxmi Sharma is research associate, both at the Indian Council for Research on International Economic Relations sbasu@icrier.res.in, lsharma@icrier.res.in)

THE GIST

- APVs integrate energy generation with agricultural production, offering a model that maximises land-use efficiency while augmenting income. Farmers can move energy back to the grid, forging new streams of income
- India lacks norms for APVs. Japan requires all structures to be temporary and removable and permits a maximum crop yield loss of 20%. Germany requires all APV systems to maintain 66% of original agricultural yield
- Scaling APV will require grants and credit. Indeed, the primary bottleneck for APV adoption is capital expenditure. Without a remunerative feed-in tariff, the viability of APVs remains uncertain

Agriphotovoltaics, or APVs, is a groundbreaking concept that merges agriculture with solar energy production.

Definition: Agriphotovoltaics (APVs) = dual-use of land for **solar power generation** + **agriculture**.

Origin: Concept proposed in 1981 by German scientists **Adolf Goetzberger** & **Armin Zastrow**.

Design:

- **Panels elevated ~2 m above ground.**
- **Allows interspace & overhead-stilted crop cultivation.**

▢ **The dual land use model proposed by these scientists allows for the simultaneous production of food and energy, which is crucial in a world facing increasing demands for both. By utilizing the same land for multiple purposes, we can enhance efficiency and sustainability**

▢ **APVs allow farmers to make the most of their land by growing crops while generating solar energy. This efficient use of space is essential, especially in regions where arable land is limited.**

Income diversification:

- Crop revenue + solar lease income or electricity sales

▢ **The solar infrastructure must be designed to allow for cultivation between the rows of solar panels, known as interspace orientation, as well as in the area beneath the elevated panels, referred to as overhead-stilted orientation.**

▢ **Despite the promise of APVs, India currently lacks standardized norms, which can create confusion in**

project design.

- ▢ **Countries like Japan and Germany have established frameworks that India can learn from.**
- ▢ **Japan mandates that APV structures be temporary and removable, with a minimum panel height of 2 meters and a maximum crop yield loss of 20%. This ensures that agriculture remains a priority.**

Smallholder Inclusion

- Most Indian farmers have **<2 ha**.
- Solutions:
  - **Farmer Producer Organisations (FPOs)** like **Sahyadri** show collective models.
  - **Institutional support**: grants, NABARD-backed guarantees.
  - Capacity-building for APV operations

Policy Recommendations

- Integrate APVs in **PM-KUSUM** scheme revamp.
- Offer **higher FiTs** (e.g., ₹4.52/unit) for economic viability.
- Establish **national APV standards**:
  - Panel height.
  - Yield retention.
  - Land-use limits.
- Prioritize **farmer income protection** over energy returns.

🧱 **Two Pillars for Success**

1. **Strong economic incentives** (FiTs, subsidies, ROI).
2. **Farmer-centric policy framework** (standards, inclusion, education).

- **Q "Agriphotovoltaics (APVs) present a viable solution to the land-use-energy nexus in India."**
  Critically examine

Topic → Mithridatism

Mithridatism is the practice of protecting oneself against a poison by gradually self-administering non-lethal amounts of it over time.

Key Points:

- **Origin**: Named after **Mithridates VI**, King of Pontus (132–63 BCE), who is believed to have taken small doses of various poisons to build immunity against assassination attempts

WHAT IS IT?

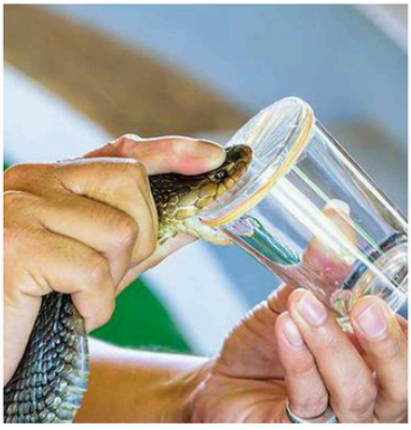
Mithridatism: poison against poison

Vasudevan Mukunth

For millennia, there have been stories of people who tried to make themselves immune to poison by regularly ingesting small, non-lethal doses of it. The practice is called mithridatism after the Pontic king Mithridates VI (135-63 BC), who reputedly immunised himself to various poisons this way.

Mithridatism is no longer practised today because scientists have developed safer, surer ways to protect the body against many toxins. A famous example is vaccines, which work by exposing the body to, say, a weakened virus so that the immune system learns to fight a non-weakened virus.

On May 2, US researchers published a paper in *Cell* reporting that an American man named Timothy Friede had subjected himself to more than 200 snakebites and 700 injections of venom over 18 years to immunise himself against their deadly effects. Injuries and deaths due to snakebites are hard to prevent, especially in India, because they usually occur in areas with poor access to antivenoms and because each snake's venom requires



Representative image. An American man named Timothy Friede has subjected himself to more than 200 snakebites and 700 injections of venom over 18 years. GETTY IMAGES/ISTOCKPHOTO

a specific set of antibodies to fight.

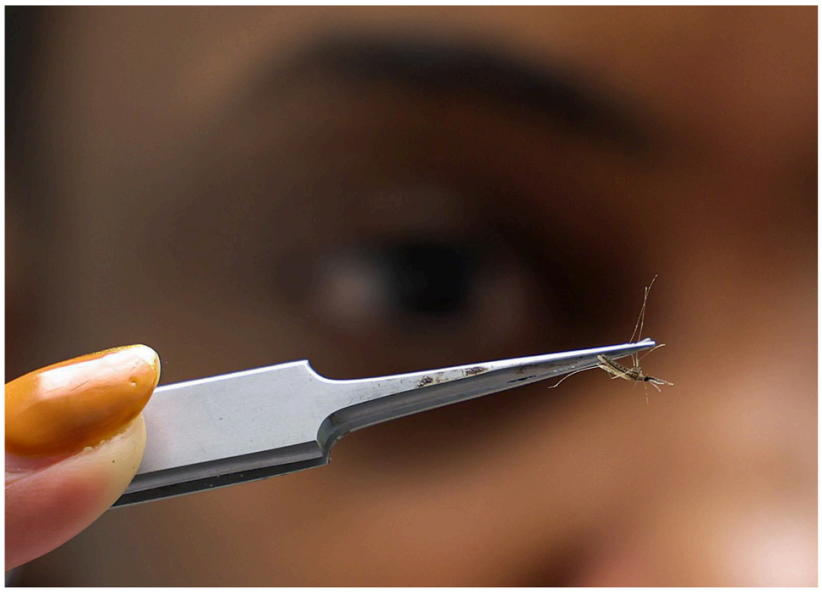
Fortuitously, the researchers found that a combination of antibodies in Mr. Friede's blood and a drug called varespladib could shield mice against 13 kinds of venom and partially defend against six more. This is a step towards the long-sought broadly neutralising antibodies — drugs that can defend people against most, if not all, venoms.

For feedback and suggestions for 'Science', please write to **science@thehindu.co.in** with the subject 'Daily page'

Topic → Anopheles gambiae

- Anopheles gambiae is one of the most well-known species of mosquito, primarily because of its role as a major vector of malaria in sub-Saharan Africa.
- Primary Vector: It is the chief transmitter of *Plasmodium falciparum*, the deadliest malaria parasite affecting humans.
- A new species of mosquito has been identified in East Africa, according to scientists from the university, the Wellcome Sanger Institute, and the Ifakara Health Institute.
- Provisionally called the 'Pwani molecular form,' the mosquito is found in coastal areas of Tanzania and Kenya and may be resistant to insecticides.

BIG SHOT



An *Anopheles gambiae* mosquito in an insectary at the University of Glasgow, on May 2. A new species of mosquito has been identified in East Africa, according to scientists from the university, the Wellcome Sanger Institute, and the Ifakara Health Institute. Provisionally called the 'Pwani molecular form,' the mosquito is found in coastal areas of Tanzania and Kenya and may be resistant to insecticides. GETTY IMAGES

Topic → The Arctic: A New Frontier of Geopolitical Competition(IR)

India must rethink its Arctic outlook

Abhijit Singh
is the former head of the maritime policy initiative at the Observer Research Foundation (ORF), New Delhi

An increasingly militarised Arctic demands new thinking from New Delhi

As conflict zones multiply globally, another frontier is quietly slipping into turmoil – the Arctic. Long seen as a realm of scientific cooperation and environmental protection, the polar north is becoming a theatre of military and geopolitical competition. With Russia more assertive, China expanding its Arctic ambitions, and Washington renewing interest in Greenland, the region appears set for a renewed phase of strategic contestation.

In a curious way, the Arctic's movement from the margins of international politics to the heart of great power competition is an outcome of more than just clashing geopolitical ambitions. Climate change has been decisive, opening new maritime corridors and resource frontiers, and spurring a scramble for access. The Northern Sea Route (NSR), once passable only during narrow summer windows, is now virtually an open sea lane. Traffic is rising, potentially redrawing global trade patterns.

A growing militarisation

Alongside this commercial promise lies a more concerning development: the steady militarisation of the high north. With Arctic states reopening old military bases, deploying submarines, and reinforcing claims through visible shows of force, the stakes for control and influence in the region are higher than ever.

To be sure, the militarising impulse of Arctic powers is not new. Nor is the tendency to leverage polar presence for wider strategic manoeuvering. United States President Donald Trump was the first to drop pretences when he proposed buying Greenland in 2019. Far from the absurdity many deemed it, the idea had clear geopolitical merit; behind Mr. Trump's theatrics lay a deeper instinct – a recognition that the Arctic was no longer peripheral to global power play, but central to it.

For non-Arctic powers such as India, the implications of a militarised Arctic are serious, prompting many to reassess their regional [illegible]. From [illegible] Delhi remains curiously insulated from the region's shifting realities. Faced with complex challenges closer to home, India appears oddly impassive to the dangers taking shape in the high north.

India's 2022 Arctic Policy offers a thoughtful road map focused on climate science, environmental protection and sustainable development. It draws strength from the parallels between the Arctic and the Himalayan "Third Pole" – anchored in the belief that glacial melt and atmospheric shifts in the far north have cascading effects on South Asia's water security and monsoon cycles.

Yet, the policy underplays the Arctic's rapidly evolving strategic landscape. As regional actors pivot from cooperative science to geopolitical contestation, India's restrained posture risks relegating it to the margins. The predisposition to remain apolitical – justifiable in an earlier era – now appears increasingly anachronistic. Besides being absent from conversations reshaping access and governance, India remains detached from the emerging politics of influence in the Far North.

This is not to say that India lacks a presence in the Arctic. It operates a research station in Svalbard, contributes to polar expeditions, and holds observer status in the Arctic Council. But these mechanisms were designed for a more benign order – one built on consensus and mutual trust. With the existing order visibly fraying, scientific diplomacy no longer seems fit-for-purpose.

A constructive role for India

The stakes for India are far from hypothetical. As the NSR becomes more viable, trade flows may shift northwards, potentially undercutting the relevance of the Indian Ocean sea lanes. Should Russia and China consolidate control over Arctic sea routes, India's aspirations to be a connectivity hub in the Indo-Pacific – articulated through initiatives such as Security and Growth for All in the Region (SAGAR) and the Indo-Pacific Oceans [illegible] – could face serious headwinds.

More concerning for New Delhi is the blurring of boundaries between the Arctic and the Indo-Pacific. Growing Russia-China strategic coordination in the Arctic and China's expanding naval presence in the Indian Ocean are making it harder for India to focus solely on its maritime interests in the south. An added challenge is the growing unease among Nordic states over India's long-standing ties with Russia, particularly as Moscow's brazenness in the Ukraine war deepens.

India has yet to reassure its Arctic partners that an approach guided by strategic autonomy, rather than alignment, can still be beneficial for all sides.

A more purposeful engagement

New Delhi, then, needs a recalibration – one that retains its climate-conscious ethos but builds sharper strategic focus. This calls for a three-part strategy. First, India must institutionalise Arctic engagement beyond science, with dedicated desks in the Foreign and Defence Ministries, regular inter-agency consultations, and collaboration with strategic think tanks. Second, New Delhi should partner with like-minded Arctic states on dual-use initiatives – polar logistics, maritime domain awareness, and satellite monitoring – that enhance India's credibility without raising red flags. Third, India must claim a seat at the table as new Arctic governance forums emerge – on infrastructure, shipping regulation, digital standards, and the blue economy. India must also approach the Arctic's political landscape with sensitivity, avoiding an extractive mindset and engaging local communities with restraint and respect.

India's current Arctic posture is not without merit, but it is no longer adequate. It rests on the hope that scientific cooperation and climate diplomacy can smooth over growing geopolitical fault lines. That hope is fast fading. The Arctic is now shaped less by principle than by power. Those unwilling to adapt could find themselves [illegible] out of the emerging order.


150° 120° 90° 60° 30° 0° 30° 60° 90° 120° 150°
Arctic Circle
ARCTIC OCEAN
60°
NORTH AMERICA
EUROPE
ASIA
30°
Tropic of Cancer
ATLANTIC OCEAN
PACIFIC OCEAN
PACIFIC OCEAN
AFRICA
Equator
SOUTH AMERICA
INDIAN OCEAN
Tropic of Capricorn
30°
PACIFIC OCEAN
ATLANTIC OCEAN
AUSTRALIA AND OCEANIA
60°
Antarctic Circle
SOUTHERN OCEAN
ANTARCTICA


saurabh pandey current affairs

The Changing Arctic Landscape

- The **Arctic**, once a zone of **scientific cooperation and environmental stewardship**, is now turning into a **theatre of geopolitical rivalry and military competition**.
- **Climate change** is the key driver — melting ice is making the **Northern Sea Route (NSR)** navigable, opening up **new trade and resource frontiers**.
- Arctic states like **Russia, China, and the U.S.** are reasserting their presence with **military deployments**, **reopened bases**, and **territorial claims**.

Climate Change as a Catalyst

- The Arctic's transition from a peaceful region to a hotbed of competition is not solely due to clashing ambitions.
- Climate change has played a pivotal role, opening new maritime corridors and resource frontiers.
- The Northern Sea Route (NSR), once navigable only during brief summer months, is now becoming a viable shipping lane year-round.
- This shift is not just about melting ice; it's about reshaping global trade patterns.

The Northern Sea Route (NSR)

As traffic increases along the NSR, the potential for economic gain is immense. However, this commercial promise is accompanied by a darker reality: the militarization of the Arctic.

The Growing Militarization of the Arctic

Historical Context of Militarization

The militarization of the Arctic is not a new phenomenon. Arctic states are reopening military bases, deploying submarines, and reinforcing territorial claims through displays of force. The stakes for control and influence in this region are escalating.

The Impact of Global Powers

- The actions of global powers, particularly the United States, have further complicated the situation.
- Former President Donald Trump's proposal to buy Greenland in 2019, while often dismissed as absurd, highlighted a crucial truth: the Arctic is no longer a

peripheral concern but a central arena for global power dynamics.

India's Current Arctic Approach

- India's **2022 Arctic Policy** is rooted in climate science, sustainability, and parallels with the **Himalayan Third Pole**.
- India maintains a **research station in Svalbard**, participates in **polar expeditions**, and holds **observer status in the Arctic Council**.
- However, this **science-first, apolitical posture** is becoming outdated as the Arctic shifts from cooperation to **strategic contestation**.

3. Strategic Implications for India

- A viable NSR could divert **global shipping routes** away from the Indian Ocean, threatening India's role as an **Indo-Pacific trade hub**.
- Rising **Russia-China cooperation in the Arctic** and China's **naval expansion in the Indian Ocean** blur regional boundaries.

A Constructive Role for India

Proposed Three-Part Strategy

To navigate these challenges, India needs a recalibration of its Arctic strategy. This involves a three-part approach:

Institutionalizing Arctic Engagement: India should establish dedicated desks in the Foreign and Defence Ministries, conduct regular inter-agency consultations, and collaborate with strategic think tanks to enhance its Arctic engagement.

Collaborating with Like-Minded States: Partnering with Arctic nations on dual-use initiatives—such as polar logistics

and maritime domain awareness—can bolster India's credibility without raising alarms.

Claiming a Seat at the Governance Table: As new Arctic governance forums emerge, India must actively participate in discussions on infrastructure, shipping regulation, and the blue economy, while engaging local communities with respect.

Conclusion

India's current Arctic posture, while commendable, is no longer sufficient. The hope that scientific cooperation can bridge growing geopolitical divides is fading. The Arctic is now defined by power dynamics, and those unwilling to adapt may find themselves marginalized in this emerging order.

🟦 GS Paper 2 – International Relations

1. Short Answer (150 words):

“India’s Arctic Policy 2022 is climate-forward but geopolitically backward.”

Discuss in the light of evolving strategic dynamics in the Arctic region.

2. Analytical Question (250 words):

The militarisation and geopolitical competition in the Arctic are redrawing global power equations.

Evaluate the implications of this shift for India’s maritime strategy and foreign policy.

Topic → Vizhinjam: India’s First Deep Water Transshipment Port and Its Global Maritime Potential.(GS PAPER 3- INFRASTRUCTURE)

Shaping the port of the future

The Vizhinjam port is of immense significance to India’s global maritime trade. Amongst all existing Indian ports, Vizhinjam is the closest to international shipping routes. Many global shipping stakeholders have already appreciated the role the port is going to play in transshipment

FULL CONTEXT

Arun P.S.

THE GIST

Trade boost: A view of the Vizhinjam International Seaport in Thiruvananthapuram on May 2, 2024. | PHOTO CREDIT:

The Historical Significance of Vizhinjam

- Vizhinjam, a quaint town in Kerala, has long been a pivotal player in the saga of global maritime trade.
- Its rich history dates back to the Pandya-Chola era, around 1129 AD, when it was known as Rajendra Chola Pattinam.
- This port was not just a dot on the map; it was a bustling hub of commerce and trade, connecting various cultures and economies.

Ancient Maritime Trade

- The significance of Vizhinjam can be traced back to ancient times when it served as a vital port for maritime trade.
- The inscriptions from the Pandya-Chola era highlight its importance, but it was the mention of Balita in the first-century travelogue, *The Periplus of the Erythraean Sea*, that truly underscores its historical relevance.
- Balita was a port of considerable commercial importance, and many historians believe that this was the old name for Vizhinjam.

The Pandya-Chola Era

- During the Pandya-Chola era, Vizhinjam thrived as a trading port, facilitating the exchange of goods between India and other parts of the world.
- The inscriptions from this period reveal a vibrant economy, where spices, textiles, and precious stones were traded, making it a melting pot of cultures.

Balita: The Old Name of Vizhinjam

- The name Balita evokes images of a bustling port, where merchants from far and wide gathered to trade.

- However, as colonial powers began to prioritize other ports like Cochin and Madras, Vizhinjam's historical significance began to fade into obscurity

The Decline of Vizhinjam's Importance

- The colonial era marked a turning point for Vizhinjam.
- As the British and other colonial powers focused on developing ports that were more strategically located for their interests, Vizhinjam was left behind.
- This shift in focus led to a decline in its prominence in global maritime trade.

Colonial Impact on Trade Routes

- The prioritization of ports like Cochin and Madras by colonizers meant that Vizhinjam lost its status as a key player in maritime trade.
- The once-bustling port became a shadow of its former self, with its historical significance overshadowed by the rise of other ports.

Strategic Advantages

- **Geographical Edge**: Closest Indian port to international shipping lanes — just **10 nautical miles** from global routes.
- **Natural Depth**: With a **20-metre natural draft**, it can host **Ultra Large Container Vessels (ULCVs)**.
- **Performance**: Already handled **6 lakh TEUs**, surpassing projections.
- **Global Integration**: Mediterranean Shipping Company (MSC) has included Vizhinjam in two key global services

The Economic Importance of Vizhinjam Port

- The Vizhinjam Port is not just a local asset; it holds immense significance for India's global maritime trade.

- Currently, around 75% of India's transshipment cargo is handled at foreign ports like Colombo and Singapore.
- The establishment of Vizhinjam as a transshipment hub is crucial for India's economic and geopolitical interests.

Current Operations and Capacity

- The port has already made a mark by handling over 6 lakh TEUs (twenty-foot equivalent units) and berthing more than 280 ships, far exceeding initial projections.
- Its natural draft of 20 meters allows it to accommodate Ultra Large Container Vessels, making it a preferred choice for global shipping companies.

India’s First Greenfield Port

- Being the first greenfield port in India, Vizhinjam represents a significant leap forward in modernizing the country's maritime infrastructure.
- It showcases the potential for innovation and efficiency in port operations.

Record-Breaking Ship Dockings

- The port has already witnessed record-breaking dockings, including the MSC Claude Girardet, the largest cargo ship to dock in South Asia.
- Such milestones not only enhance the port's reputation but also attract more shipping lines to consider Vizhinjam as a viable option.

Future Prospects and Challenges

- While the future looks promising for Vizhinjam, there are challenges that need to be addressed.
- The Kerala government is pushing for rapid development of associated infrastructure to support the port's operations.

Infrastructure Development Needs

- The arrival of multiple ships has highlighted the need for improved infrastructure.
- Delays in operations due to inadequate facilities must be resolved to ensure smooth functioning and maximize economic benefits.

Economic Growth Potential

- The potential for economic growth in the region is immense.
- The Kerala government has announced plans for a Vizhinjam Development Zone, focusing on creating an industrial corridor that will boost local economies and create jobs.

Conclusion

- Vizhinjam's journey from a historical port to a modern maritime hub is a testament to its resilience and potential.
- With strategic investments and a focus on infrastructure development, Vizhinjam is set to reclaim its place in the global maritime trade landscape.

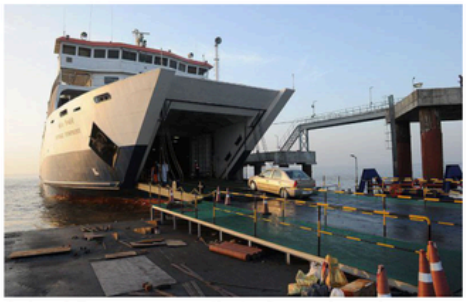
Topic → RO PAX SERVICE

Gujarat's ro-pax service loses money

Avinash Nair

It's been seven long years since Gujarat proudly launched its ferry service across the Gulf of Khambhat – a dream project meant to link rural Saurashtra with the vibrant city of Surat and its famed textiles and diamonds. Backed by the Centre's Sagarmala initiative and boasting sleek new ro-pax ships – capable of ferrying vehicles and passengers – from South Korea and Japan, you'd think it would be smooth sailing.

But the reality is quite different. The ambitious venture is losing money. The project's first ship, 'Island Jade', was brought in with great hope by a Surat businessman in 2017, to launch the service between Ghogha, on the western flank of the Gulf of Khambhat, and Hazira on the eastern side.



Code red: The company operating the ferry service has incurred a net loss of ₹325 crore, according to the promoter.

"Despite achieving 55% capacity utilisation in transporting passengers and an impressive 87% in cargo capacity utilisation, we are unable to meet the cost of operating the ferry service. We now have a net loss of ₹325 crore," says Chetan Contractor, promoter-chairman of Surat's Detox Group, which operates the ferry through it subsidiary Indigo Seaways Pvt. Ltd.

In November 2020, the Union Ministry of Ports, Shipping and Waterways operationalised ro-pax ferry service between Ghogha and Hazira after Prime Minister Narendra Modi flagged it off with great fanfare. It has since transported 12.59 lakh passengers and 4.5 lakh vehicles. Compared to road transport, the ferry service cuts travel between Ghogha in Bhavnagar district and Hazira in Surat district by 400 km.

Unsecured loans

"Till date, we have unsecured loans totalling ₹242 crore, and we have no clue how to repay it. Even after selling the two vessels, a huge amount will be outstanding," says Mr. Contractor. He adds the ₹90 crore cost incurred on terminal operations has not been reimbursed by government agencies as per the tripartite agreement inked between Indigo Seaways, Deendayal Port Authority, and Gujarat Maritime Board.

"The cost of operating the ferry terminals is not our responsibility. Secondly, we had bought a second ferry from Japan as we were expecting to bag the proposed Pipavav-Hazira and Pipavav-Mumbai ferry services. However, both projects did not take off and we were forced to deploy the ferry on the Ghogha-Hazira route in November 2022, after it had idled for 1.5 years at Pipavav port," he says.

Need viability gap fund

The ferry operator has now sought viability gap funding from the government. "The ro-pax ferries are competing with road and rail transport of the government, which operate on subsidies. We have written to the GoI seeking support, without which the project is not financially viable and it will be impossible to continue operating the service," he says.

To attract more traffic to the ferry service, the company had fixed the average ticketing price at ₹400-600 per passenger or half of the actual ticket cost.

The history of the ferry service across the Gulf of Khambhat is much older. The project had been on the drawing board since 1995. However, it was in June 2010 that the project received Coastal Regulation Zone clearance for construction activities and operation of the ferry service. It was originally planned to operate between Ghogha and Dahej.

(The writer is with The Hindu businessline)

- A RoPax service is a ferry that carries both passengers and vehicles.
- It's a hybrid vessel designed for short-to-medium distance routes, offering a convenient way for people to travel with their cars or other vehicles on the water.
- RoPax ferries are becoming increasingly popular as a way to reduce travel time, traffic, and emissions compared to road travel

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