

AI AND A GATHERING STORM OF UNCHECKED POWER

- The influence of Artificial Intelligence (AI) now extends across economic systems, governance, warfare, and everyday human interaction, however, alongside its transformative potential lies a **growing sense of unease**.
- Developments involving companies such as Palantir Technologies and OpenAI reveal that AI is **not merely a technological tool** but a mechanism of **power**, one that raises urgent ethical, political, and social concerns.
- Therefore, it is important to examine the implications of AI's expansion, focusing on militarisation, regulatory failures, corporate accountability, and the urgent need for **global governance**.

AI and the Shift Toward Hard Power

- **The Ideological Transformation**
 - A significant shift in thinking about AI is reflected in the ideas of Alexander C. Karp, who argues that democratic societies can no longer rely solely on moral authority.
 - Instead, hard power driven by software will determine global dominance.
 - This perspective signals a departure from traditional democratic ideals, placing technological superiority at the centre of geopolitical strategy.
- **AI in Warfare**
 - The use of AI in military operations illustrates this shift vividly. Systems like Palantir's defence platforms are increasingly involved in **identifying and selecting targets**.
 - Such developments raise serious ethical concerns, particularly when civilian casualties are involved.
 - The delegation of life-and-death decisions to algorithms introduces ambiguity in accountability and challenges established norms of international law.

The Alarming Absence of Regulation

- **Warnings from Within the Industry**
 - Even leaders within the AI industry, such as Sam Altman, have expressed concern over the pace of technological advancement.
 - OpenAI's policy document highlights that AI is evolving faster than society's ability to adapt, calling for proactive and forward-looking governance.
- **Limitations of Current Policy Approaches**
 - Governments have largely failed to implement comprehensive policies, relying instead on vague or voluntary guidelines.
 - This gap between innovation and regulation creates a **dangerous environment** where powerful technologies operate without sufficient oversight.

The Need for Global Regulation and Collective Action

- **Emerging International Efforts**
 - Regulatory initiatives such as the European Union's AI Act and policy proposals from countries like Brazil demonstrate that governance is both possible and necessary.
 - Leaders such as Luiz Inácio Lula da Silva have emphasised the importance of protecting human rights, data privacy, and national interests.
- **India and the Global South's Role**
 - Countries like India, which currently follow a relatively soft regulatory approach, have an opportunity to take a **more proactive stance**.
 - By strengthening legal frameworks and participating in global cooperation, they can help shape a more equitable AI ecosystem.

Conclusion

- While AI offers unprecedented opportunities, its unchecked expansion threatens to undermine **democratic accountability**, civil liberties, and global equality.
- Through robust regulation, international cooperation, and public engagement, it is possible to ensure that **AI serves humanity** rather than dominates it.

GALAXEYE'S DRISHTI SATELLITE

Indian space start-up **GalaxEye** launched its **first satellite 'Drishti'** aboard a SpaceX Falcon 9 rocket from Vandenberg Space Force Base, California, as one of 45 payloads on the CAS500-2 mission.

Founded by IIT Madras alumni, GalaxEye has created the **world's first satellite** capable of capturing optical and radar images simultaneously of the same location — a technological first in space imaging.

Space Imaging

- Space imaging refers to the collection of visual and electromagnetic data from space, used to map celestial bodies, track cosmic phenomena, and monitor Earth's environment.
- This technology translates data from across the electromagnetic spectrum into high-resolution imagery.

Limitations of Existing Imaging Technologies

- Space imaging satellites currently use one of two technologies:
 - **Optical/Multi-spectral Imaging** — Works like a normal camera, producing clear, intuitive, and easy-to-understand images.
 - However, it is ineffective during cloudy weather or night time — a significant limitation for tropical countries like India where cloud cover is frequent and unpredictable.
 - **Synthetic Aperture Radar (SAR)** — Uses radar signals that can penetrate clouds and capture images continuously regardless of weather or lighting conditions.
 - However, SAR images are not intuitive — like X-ray images, they require trained experts to interpret the data, limiting their usability for general users.

What Makes Drishti Unique — The Opto-SAR Technology?

- Drishti is the **world's first satellite** equipped with both optical and SAR sensors operating simultaneously to capture images of the same location at the same time.
- GalaxEye calls this proprietary innovation "**Opto-SAR technology.**"
- **The Core Technological Challenge — and How It Was Solved**
 - SAR and optical sensors are designed differently and look at Earth at different angles.
 - If placed side by side without synchronisation, the optical sensor might be capturing Bengaluru while the SAR sensor is simultaneously capturing Dubai.
 - GalaxEye developed a **proprietary technology stack** that synchronises the functionalities of both sensors, enabling them to look at the exact same location at the same time.
 - Hence, it eliminates the need for users to manually align datasets from two different satellites.
- **The AI Dimension**
 - When optical sensors are unable to capture images due to clouds, Drishti uses Artificial Intelligence to regenerate optical-like images from SAR data — further bridging the gap between clarity and all-weather reliability.

Applications of Drishti

- The data produced by Drishti has both civilian and military applications including:
 - agriculture monitoring,
 - disaster management,
 - urban planning,
 - infrastructure monitoring,
 - border surveillance, and
 - defence intelligence.

LIPULEKH PASS - NEPAL'S OBJECTION TO MANSAROVAR YATRA HAS RENEWED BOUNDARY DISPUTE

- The newly elected government in Nepal has raised objections to India and China for planning to conduct the Kailash Mansarovar Yatra through the Lipulekh Pass, a **disputed tri-junction**.



Strategic location: Lipulekh Pass lies at the India-Nepal-China **tri-junction** and serves as a key route for trade and pilgrimage.

- **Historical basis:**
 - Nepal claims the region based on the **Treaty of Sugauli** of 1816.
 - It asserts that Limpiyadhura, Lipulekh, and Kalapani, east of the Mahakali River, belong to Nepal.
- **India's stand:** Lipulekh has been a **traditional route** for the Kailash Mansarovar Yatra since **1954**. It rejects Nepal's claims as "unjustified and not based on historical evidence."
- **China's role:** Engaged in trade resumption with India through Lipulekh (2025), adding a trilateral dimension to the dispute.

Positions of Stakeholders:

- **Nepal:**
 - Reiterates territorial sovereignty based on historical treaties, maps, and evidence.
 - Demands halt to infrastructure, trade, and pilgrimage activities in the disputed region; preferably **trilateral** negotiations involving China, emphasizing resolution through diplomatic means.
- **India:**
 - Asserts longstanding customary usage of Lipulekh for pilgrimage.
 - Blame Nepal's territorial claims as "**artificial enlargement**".
 - Supports **bilateral** dialogue mechanisms to resolve boundary issues.

Significance of route for India:

- **Geopolitical:** Maintaining influence in Nepal amid growing China presence.
- **Security:** Strategic control over Himalayan passes.
- **Cultural diplomacy:** Ensuring continuity of pilgrimage routes.
 - **China:** Maintains trade cooperation with India via Lipulekh, and has been informed by Nepal of its territorial claims but remains largely silent publicly.

Historical Evolution of the Dispute:

- **1954 onwards:** India uses the Lipulekh route for the Mansarovar Yatra.
- **2020:** Dispute intensifies after India builds a road in the region; Nepal publishes a new political map including disputed areas.
- **2025:** Nepal protests India-China trade resumption via Lipulekh.
- **2026:** Fresh tensions due to Yatra announcement.

Key Issues and Challenges:

- **Boundary ambiguity:** Different interpretations of the Mahakali River's origin under the Sugauli Treaty.
- **Nationalism and domestic politics:** The boundary issue embedded in Nepal's constitution—limits flexibility of any government.
- **Strategic sensitivity:** The tri-junction area has implications for India-China relations and regional security.
- **Trilateral vs bilateral approach:** Nepal's demand for trilateral talks vs India's preference for bilateral resolution.
- **Impact on cultural/religious diplomacy:** Potential disruption of the Kailash Mansarovar Yatra, affecting people-to-people ties.

Conclusion:

- The Lipulekh dispute underscores the **complexities** of Himalayan boundary politics, where history, geography, and nationalism intersect.
- A **calibrated** diplomatic approach, rooted in dialogue and mutual sensitivity, is essential to preserve India-Nepal relations and regional stability.

INLAND WATERWAYS - INDIA'S EMERGING STRENGTH IN SUPPLY CHAIN RESILIENCE

- Inland water transport (IWT) refers to the movement of goods and passengers through navigable rivers, canals, backwaters, and creeks using boats and vessels.
- It is one of the most efficient and environmentally friendly modes of transport, complementing road and rail networks in India's multimodal logistics strategy.
- India has an extensive network of over **14,500 km of navigable waterways**, of which **111 waterways have been declared as National Waterways (NWs)** under the **National Waterways Act, 2016**.
- The **Inland Waterways Authority of India (IWAI)**, established in 1986, is the nodal agency for developing and maintaining these national waterways.
- Major operational National Waterways include:
 - **NW-1:** Ganga-Bhagirathi-Hooghly River system from Prayagraj to Haldia
 - **NW-2:** Brahmaputra River in Assam
 - **NW-3:** West Coast Canal in Kerala
 - **NW-4 & NW-5:** Connecting river systems in Andhra Pradesh, Odisha, and Tamil Nadu
- These waterways are being developed with modern terminals, navigational aids, and vessel support services to facilitate steady cargo and passenger operations.

Importance of Inland Waterways

- **Cost Efficiency:** Water transport has the lowest per-tonne-per-kilometre cost, saving fuel and reducing logistics expenditure.
- **Environmental Benefits:** It generates lower carbon emissions compared to road and rail transport.
- **Decongests Roads and Railways:** By shifting bulk cargo movement to waterways, pressure on other modes is reduced.

- **Boosts Trade and Connectivity:** Enhances access to markets for agricultural and industrial goods, especially in hinterland regions.
- The government's **Jal Marg Vikas Project (JMVP)** on NW-1 and several regional initiatives under the **Sagarmala** and **PM Gati Shakti** programmes aim to integrate inland waterways with ports, rail, and road connectivity, thereby strengthening India's logistics ecosystem.

INDIA'S FIRST GREEN METHANOL PLANT TO TURN KUTCH'S MOST INVASIVE WEED INTO MARINE FUEL

- **April 2026:** India's first green methanol plant at **Kandla (Deendayal Port Authority)** proposes using invasive **Prosopis juliflora** as feedstock, linking biodiversity management with clean fuel transition.

Static Background

- **Prosopis juliflora:** Mexican-origin invasive shrub introduced in India (1920s–1960s) to combat desertification; now classified among “**top 100 invasive species globally**”.
- **Green Methanol:** Produced from biomass via **gasification** → **syngas** → **methanol**, used as alternative maritime fuel under **International Maritime Organization (IMO) decarbonisation norms**.

Overview

- **Prosopis juliflora** has **encroached over thousands of sq km in Banni grasslands (Kutch)**, displacing native grasses and pastoral livelihoods, representing classic invasive species threat to biodiversity.
- Converting invasive biomass into green methanol integrates **environmental restoration with circular economy**, reducing ecological damage while creating economic value.
- Green methanol aligns with India's **Green Ports Policy and maritime decarbonisation strategy**, supporting transition away from high-emission bunker fuel.
- Gasification technology converts biomass into **syngas (CO + H₂)**, enabling production of low-carbon fuels, positioning India in emerging **green fuel value chains**.

Data & Evidence

- Green methanol can reduce **CO₂ emissions by up to 95%** and **NO_x by 80%**, while eliminating sulphur oxides and particulate matter (Methanol Institute).
- Prosopis juliflora spread across **thousands of sq km in Kutch's Banni grasslands**, severely impacting native biodiversity and grazing systems.
- Biomass potential (agri residues + juliflora) could **replace up to one-third of India's oil imports (industry estimate)**.

Challenges / Gaps

- Large-scale harvesting of invasive species requires **logistical, ecological, and cost feasibility assessment**.
- Risk of **overdependence on single feedstock** and sustainability concerns if extraction disrupts local ecosystems.
- Technology scalability and cost competitiveness of green methanol vs fossil fuels remain uncertain.
- Weak regulatory framework for **invasive species management and biomass supply chains**.

Way Forward

- Develop integrated policy linking **invasive species eradication with bioenergy production**, ensuring ecological safeguards.
- Strengthen **National Bioenergy Mission and SATAT scheme** to support biomass-based fuels including methanol.
- Incentivise green shipping under **Green Ports Policy and Maritime India Vision 2030**.
- Promote R&D and PPP models for **cost-effective gasification technologies and scaling green methanol production**.
- Ensure community participation (pastoralists) in biomass harvesting for **inclusive livelihood generation**.