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FOR UPSC CIVIL SERVICE EXAMINATION

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I. India's Healthcare System: Accessible, Affordable, and Globally Recognized

• Qualitative, Accessible, and Affordable Healthcare

- Lok Sabha Speaker Om Birla highlighted that **India's healthcare system is not only qualitative but also accessible and affordable**, emphasizing its inclusivity and patient-centric approach.
- Key initiatives like **Ayushman Bharat** have ensured free or affordable treatment to economically weaker sections, reducing out-of-pocket expenditure.
- Definition: *Accessibility* means healthcare is available to all without barriers; *affordability* implies financial protection; *quality* indicates high standard of medical care.

• Advances in Digital Health and Outreach

- India has made significant progress in **digital health technologies**, telemedicine, and rural outreach programs to extend services to remote areas.
- The **National Digital Health Mission (NDHM)** aims to create a unified digital health ecosystem to improve efficiency and transparency.



• Global Leadership in Pharma and Medical Research

- India is emerging as a **global hub for pharmaceuticals and biomedical research**, leading in drug manufacturing, vaccine production (e.g., COVID-19 vaccines), and generic medicines.
- Initiatives encouraging **research and development (R&D)** and collaboration with global institutions are strengthening India's position on the international stage.

• Role of Human Resources in Healthcare

- Despite limited resources, the **dedication and sacrifice of doctors, nurses, and healthcare workers** helped India effectively handle the COVID-19 pandemic.
- India's healthcare workforce is increasingly recognized globally for its expertise and service.

• Emphasis on Innovation and New Technologies

- Shri Birla stressed the importance of **innovation, AI, robotics, and modern medical technologies** in addressing current and future health challenges.
- Focus on fostering a **research-oriented culture** to develop new treatments, improve disease prevention, and create a human-centered healthcare system.

• Constitutional and Policy Framework

- Article 21 of the Constitution guarantees the **Right to Life**, which has been interpreted by the Supreme Court to include the **right to health** (Paschim Banga Khet Mazdoor Samity case, 1996).
- Directive Principles of State Policy (Article 47) obligate the State to raise the level of nutrition and improve public health.



- Policies like the **National Health Policy 2017**, and schemes like **Ayushman Bharat – PM-JAY**, support universal health coverage.

Conclusion

India's healthcare system has evolved into a robust, inclusive, and innovative model, gaining global recognition for its quality and affordability. Strategic investments in research, digital health, and human resources, coupled with constitutional backing and policy initiatives, have positioned India to meet both domestic and global health needs effectively. As India moves forward, the focus on equitable access and technological advancements will be crucial in shaping a healthier future for all.

2. BRICS Summit Declaration: India's Concerns on Terrorism and Global Governance

• Emphasis on Global Governance Reforms

- Prime Minister Narendra Modi highlighted that **two-thirds of humanity lack proper representation** in major global institutions like the UN Security Council.
- India advocated for **more inclusive and representative global decision-making**, especially for the Global South, to enhance credibility and effectiveness of international organizations.
- Definition: *Global governance* refers to the cooperative leadership and regulation of international issues by institutions like the UN, IMF, and World Bank.

• Support for India's Role in Global Institutions

- The **BRICS Leaders' Declaration** acknowledged support from Russia and China for India and Brazil to play a greater role in the UN, including the Security Council.
- India has long advocated for reforms in the UNSC to reflect current global realities and give developing nations a rightful voice.



• Strong Stand Against Terrorism

- The declaration **condemned the Pahalgam terror attack in the strongest terms**, reinforcing India's stand against terrorism, especially **cross-border terrorism**.
- BRICS leaders emphasized early finalization of the **Comprehensive Convention on International Terrorism (CCIT)** under the UN framework.
- Definition: *Cross-border terrorism* refers to terrorism perpetrated across national borders, often involving support from state or non-state actors in another country.

• Call for Representative International Order

- The declaration called for a **more representative and democratic international system**, addressing longstanding concerns of the Global South regarding double standards and unequal treatment.



- India's emphasis reflects its consistent advocacy for reforming Bretton Woods institutions (like IMF and World Bank) to give developing countries more say.

• BRICS Expansion and Dynamic Evolution

- PM Modi welcomed Indonesia as a new BRICS member, highlighting the grouping's adaptability and relevance in changing geopolitical contexts.
- The expansion symbolizes BRICS's commitment to inclusivity and increased representation of emerging economies.

• Stand on International Law

- The BRICS leaders criticized Israel-U.S. military actions against Iran, terming them **violations of international law and UN Charter**, reinforcing commitment to sovereignty and non-intervention.
- Definition: *Charter of the United Nations* is a foundational treaty establishing the UN, emphasizing respect for sovereign equality and non-use of force.

Constitutional and Legal Context (India)

- Article 51 of the Indian Constitution directs the State to promote international peace and security and encourage respect for international law.
- India's **non-alignment policy** and emphasis on multilateralism are rooted in its foreign policy tradition, supporting equitable global governance structures.

Conclusion

The BRICS Summit Declaration reflects India's strategic priorities — combating cross-border terrorism, pushing for comprehensive reforms in global governance, and ensuring equitable representation for developing nations. With growing support from major powers and expansion of BRICS, India's vision for a more inclusive and just international order gains further legitimacy. This aligns with constitutional principles of promoting international peace and underscores India's emerging leadership on the global stage.

3. Indigenous Nuclear Reactors in Gujarat: Strengthening India's Atomic Energy Capability

• Indigenous Development of PHWRs

- The Atomic Energy Regulatory Board (AERB) has granted **operational licence to two indigenously developed 700 MWe Pressurised Heavy Water Reactors (PHWRs)** at Kakrapar Atomic Power Station (KAPS), Gujarat.
- These are the first fully Indian-designed 700 MWe PHWRs, marking a significant milestone in India's atomic self-reliance under the **Atmanirbhar Bharat initiative**.



• Rigorous Multi-tier Safety Reviews

- The licensing process included **multi-stage safety reviews**, covering siting, construction, and full-power commissioning phases, over nearly 15 years.



- The AERB and various reactor safety experts ensured compliance with stringent national and international safety standards before operational clearance.

• Strengthening Nuclear Power Capacity

- The operationalization of KAPS Units 3 and 4 contributes to India's plan of expanding its nuclear energy capacity through **fleet-mode construction of 10 PHWRs** of 700 MWe each.
- India aims to increase nuclear power capacity to meet growing energy demands and support its climate commitments under the Paris Agreement.

• Role of NPCIL

- The **Nuclear Power Corporation of India Ltd. (NPCIL)** is responsible for the design, construction, and operation of nuclear power reactors in India.
- NPCIL's success in developing indigenous technology enhances India's strategic capabilities and reduces dependence on foreign nuclear technology.

• Legal and Constitutional Provisions

- **Article 21** (Right to life) has been judicially interpreted to include the right to a clean and safe environment, which emphasizes safe use of nuclear energy.
- The **Atomic Energy Act, 1962**, governs the development, control, and use of atomic energy for the welfare of people and security of the nation.
- The AERB, constituted under this Act, is responsible for ensuring nuclear and radiation safety in India.

• Definition of Key Terms

- **Pressurised Heavy Water Reactor (PHWR):** A nuclear reactor that uses heavy water (deuterium oxide) as both coolant and moderator, enabling the use of natural uranium as fuel.
- **Fleet-mode construction:** Building multiple reactors of the same design simultaneously to optimize resources, reduce costs, and accelerate deployment.

Conclusion

The licensing of Kakrapar's indigenous 700 MWe reactors is a significant step towards achieving self-reliance in nuclear technology, boosting India's clean energy goals, and strengthening its energy security. Through rigorous safety standards and indigenous innovation, India is advancing as a responsible nuclear power nation, in line with constitutional principles of environmental protection and technological development. This achievement positions India to better meet its future energy demands sustainably and securely.

4. Emergency Landing and Repair of U.K. RAF Jet in India: Key Highlights

• Emergency Diversion and Landing in India

- A **Royal Air Force (RAF) F-35B combat jet** made an emergency landing at Thiruvananthapuram International Airport on June 14 due to technical glitches.



- The aircraft, one of the most advanced stealth fighter jets, required immediate technical assistance, highlighting India's strategic importance as an aviation hub.

• Arrival of U.K. Engineering Team

- A **Royal Air Force Airbus A400M Atlas**, a large military transport aircraft, carried a team of 14 engineers and 10 crew members from the U.K. to India.
- The team arrived on July 7 and shifted the grounded jet to the airport hangar for detailed inspection and repair.

• Repair and Contingency Plan

- The U.K. engineering team is working at the **Maintenance, Repair, and Overhaul (MRO) facility** at Thiruvananthapuram.
- If repair attempts fail, the jet's tail and wings will be dismantled and it will be **airlifted back to the U.K.**, showcasing meticulous standard operating procedures (SOPs) for high-value defense assets.

• Significance of India's Aviation and MRO Capability

- India's ability to host and support such advanced aircraft repairs underlines its growing **MRO infrastructure and aviation capabilities**.
- It demonstrates India's emerging role as a reliable partner in global defense logistics and maintenance support.

• Legal and Constitutional Context

- Under the **Aircraft (Public Health) Rules, 1954**, and **Indian Aircraft Rules, 1937**, emergency landings by foreign military aircraft require diplomatic clearances and must adhere to Indian air safety and security protocols.
- Article 51 of the Indian Constitution promotes international peace and security, reflecting India's cooperation in allowing repair of foreign military equipment on its soil.



• Definitions of Key Terms

- **MRO (Maintenance, Repair, and Overhaul):** Facilities and services involved in maintaining and repairing aircraft to ensure safety and airworthiness.
- **Emergency landing:** An unplanned landing made in response to a critical technical or safety issue to prevent accidents.

Conclusion

The emergency landing and repair of the RAF F-35B jet in Thiruvananthapuram highlights India's advanced aviation infrastructure and diplomatic openness to global defense cooperation. It strengthens India's position as an emerging hub for aviation maintenance and underscores the importance of international collaboration in aerospace and defense. The incident also demonstrates India's adherence to international norms and its



capability to provide critical support during unforeseen military technical challenges, reflecting both strategic significance and operational maturity.

5. The New Security Challenge: China-Pakistan Collusion and Implications for India

• Evolving Nature of China-Pakistan Military Cooperation

- During **Operation Sindoor (May 2025)**, India faced unprecedented **battlefield collusion between China and Pakistan**, with China providing advanced military hardware, intelligence-surveillance-reconnaissance (ISR) support, and tactical guidance.
- Unlike past conflicts (1965, 1971, 1999) where China limited its support to diplomatic backing, this time China actively enabled Pakistan's operational capabilities without direct troop involvement.

• Integrated Tactical and Technological Support

- Pakistan deployed advanced **Chinese-origin systems**, including J-10C fighters with PL-15 missiles, HQ-9 air defense systems, and BeiDou satellite navigation support, enhancing its battlefield effectiveness.
- Chinese ISR assets and real-time data support significantly strengthened Pakistan's situational awareness and targeting capabilities, illustrating the depth of military interoperability built through joint exercises like **Shaheen-series**.

• Strategic and Diplomatic Dimensions

- China's narrative alignment with Pakistan at the **United Nations Security Council (UNSC)** diluted global condemnation of terrorism (e.g., Pahalgam attack).
- Chinese state media amplified Pakistani propaganda, shaping international perception and justifying Pakistan's military actions as "defensive."

• Emergence of a "One-Front Reinforced War"

- The theoretical "two-front war" has evolved into a "**one-front reinforced war**," where Pakistan's military actions are actively supported by China without crossing thresholds that trigger direct confrontation.
- This collusion compels India to spread resources along both northern (China) and western (Pakistan) fronts, demanding robust deterrence and readiness for simultaneous conflict.



• Policy, Modernisation and Constitutional Context

- India needs to strengthen **network-centric warfare**, drone capabilities, and advanced ISR infrastructure to counter combined threats.
- Declining defense expenditure (from 17.1% of central spending in 2014–15 to 13% in 2025–26) needs reassessment to meet future challenges.
- **Constitutional context:** Article 51 promotes international peace and security; however, Article 21 (Right to life) implicitly mandates national security as a precondition for protecting citizens' rights.



• Definitions of Key Terms

- **ISR (Intelligence, Surveillance, and Reconnaissance):** Systems and activities that provide situational awareness and targeting information in real time.
- **Network-centric warfare:** Use of digital networks to integrate forces and enhance combat efficiency.
- **Grey-zone tactics:** Activities below the threshold of open warfare but designed to achieve strategic gains.

Conclusion

China-Pakistan collusion represents a major shift in regional security dynamics, transforming isolated confrontations into integrated, technologically advanced threats. India must urgently recalibrate its defense posture, modernize its forces, and develop flexible strategic options beyond conventional military responses. This includes diplomatic signaling to impose costs on collusive actions, exploring non-kinetic levers, and maintaining strategic unpredictability. Recognizing this new reality is essential for safeguarding India's sovereignty and ensuring credible deterrence in an increasingly contested security environment.

6. Khelo Bharat Niti 2025: Transforming Indian Football and Sports Ecosystem

• Launch of Khelo Bharat Niti 2025

- The **Khelo Bharat Niti 2025 (National Sports Policy)** was approved by the Union Cabinet on July 1, 2025, as a transformative framework to promote sports as an integral part of building a **Viksit Bharat (Developed India)**.
- The policy aligns with India's aspiration to become a global sports powerhouse and supports its bid to host the 2036 Olympics.

• Five-Pillar Approach to Sports Development

- The policy adopts a **five-pillar approach**, particularly relevant to football:
 1. **Sports Excellence:** Enhancing the national team's global performance.
 2. **Sports for Social Development:** Promoting inclusion and community integration through football.
 3. **Sports for Economic Development:** Generating jobs and boosting sports industries through events and manufacturing.
 4. **Sports as a People's Movement:** Encouraging grassroots and community participation.
 5. **Sports in Education:** Integrating sports like football into the school curriculum to nurture talent from a young age.





• Integration of Overseas Talent

- The policy acknowledges the potential of players with **Overseas Citizens of India (OCI) cards**, mirroring global trends where diaspora athletes strengthen national teams (e.g., Malaysia, Singapore).
- **Legal Context:** India does not allow dual citizenship as per the Citizenship Act, 1955, and an OCI card does not equate to an Indian passport, which is a FIFA requirement for international representation.

• Grassroots Development through Education

- In alignment with the **National Education Policy (NEP)**, the policy introduces football training from age 8 onwards, ensuring a systematic talent pipeline to professional levels.
- Through the **FIFA Football for Schools (F4S) programme**, football has reached over 1.5 lakh schools, distributing more than 9 lakh footballs and creating accessible entry points for children.

• Constitutional and Policy Linkages

- **Article 21 (Right to Life)** includes the right to holistic development, including sports and physical education.
- **Directive Principles of State Policy (Article 47)** encourage the state to improve public health, which implicitly covers promoting physical fitness through sports.
- The policy complements the NEP 2020, aiming to create a well-rounded and inclusive educational and sports ecosystem.

• Definitions of Key Terms

- **Viksit Bharat:** A vision of a fully developed India by mid-21st century, economically and socially advanced.
- **OCI (Overseas Citizen of India):** A scheme providing certain privileges to foreign citizens of Indian origin, but not full citizenship.

Conclusion

The **Khelo Bharat Niti 2025** represents a bold, integrated vision to establish India as a global sporting nation by leveraging sports for social inclusion, economic growth, and international prestige. By focusing on grassroots development, diaspora engagement, and school-level integration, the policy aims to create a robust sports culture, empower youth, and project India's soft power globally. For UPSC aspirants, this reflects the importance of sports policy as a tool for national development, aligning with constitutional mandates and India's broader developmental goals.

7. India's Strategic Diplomacy: Measured, Pragmatic, and Interest-Centric

• India's Balanced Approach in the Israel-Iran Conflict

- Amid the **June 2025 Israel-Iran military tensions**, India adopted a **restrained and balanced diplomatic stance**, calling for **de-escalation and peace** in the region.



- India provided humanitarian assistance, evacuated citizens through **Operation Sindhu**, and voted for a **permanent ceasefire in Gaza** at the UN General Assembly, highlighting its principled yet pragmatic approach.

• Strategic Autonomy and Non-Alignment 2.0

- India maintains **strategic autonomy**, engaging with **all stakeholders** in volatile regions without taking sides in external conflicts.
- This is reflective of **Non-Alignment 2.0**, where India avoids entanglement in power blocs but safeguards **national interests** in global affairs, especially in sensitive regions like **West Asia**.



• Complex West Asian Calculus and Realpolitik

- India balances **defence ties with Israel**, **energy trade with Iran**, and protects the interests of its **diaspora in Gulf nations**.
- Despite pressures from Western nations or religious affiliations (e.g., Arab solidarity with Pakistan), India navigates its diplomacy based on **national interest**, not ideology or emotion.

• Terrorism, Double Standards, and Global Inconsistencies

- India's **Operation Sindoor** against Pakistan after the Pahalgam terror attacks underscored its **zero-tolerance approach to terrorism**.
- However, **Western powers and multilateral institutions** have often supported Pakistan diplomatically or militarily, ignoring its terror links, to serve their own geostrategic aims (e.g., access to ports/airbases).

• Nuclear Proliferation Risks in West Asia

- The ongoing instability in West Asia and the potential for **nuclear escalation** increase risks to global peace.
- India emphasizes **arms control, regional cooperation, and non-proliferation**, in line with its commitment to the **Treaty on the Non-Proliferation of Nuclear Weapons (NPT)**, though India itself is not a signatory.

• Key Constitutional & Legal Linkages

- **Article 51(c)** of the Indian Constitution directs the state to **promote international peace and security**, supporting India's diplomatic efforts for de-escalation and stability.
- India's **National Security Doctrine** emphasizes maintaining **strategic autonomy**, safeguarding citizens, and responding proportionately to threats.

• Key Definitions

- **Strategic Autonomy**: The ability of a state to pursue its national interests and make independent foreign policy decisions without external influence.



- **Non-Alignment 2.0:** An evolved form of India's traditional non-alignment policy, adapted to the multipolar, globalized world, focusing on autonomy, interests, and partnerships without alignment to any power bloc.

Conclusion

India's diplomacy is no longer driven by idealism or emotional rhetoric, but by **realpolitik**, strategic foresight, and national interest. Its **measured silence** amid global crises reflects **maturity and growing stature**, not passivity. In an era of volatile geopolitics, maintaining **strategic balance, autonomy, and diplomatic credibility** ensures India remains a stable voice in global forums while advancing its economic and security interests. This approach reinforces India's position as a **responsible global power** in the emerging world order.

8. The Global Fight Against Tuberculosis: A Historical Reversal

• Early Decline and Overconfidence

- By the **mid-20th century**, TB rates had drastically declined in the U.S. and Europe, due to **better living conditions, nutrition, and antibiotics** discovered in the 1950s.
- The success led to **complacency**, with the U.S. stopping dedicated TB program funding in 1972, assuming eventual elimination.

• Unexpected Resurgence in the 1980s–1990s

- The **HIV/AIDS epidemic** weakened immune systems, turning latent TB infections into active ones; nearly **half of TB deaths in the U.S. in 1993** were among HIV-positive individuals despite them being a tiny fraction of the population.
- Rise of **drug-resistant TB** due to improper use of antibiotics and incomplete treatment regimens, making cases harder and more expensive to treat.
- Increased **immigration from high TB burden countries** (post-1965 immigration reforms) brought higher rates among foreign-born populations, nearly **four times higher than native-born Americans**.

• Global Realization of TB Burden

- In **1990**, there were around **8 million new cases and 3 million deaths** globally, double the previously recorded numbers, revealing severe underreporting.
- In 1993, WHO declared TB a "**global health emergency**", emphasizing the disease's persistent and underestimated threat.

• Importance of Surveillance and Data

- Detailed data enabled identification of links between **HIV and TB**, and the failure of standard treatments against **drug-resistant strains**.
- Transparent data and continuous surveillance were crucial for early detection of trend reversals and for targeted interventions.





• Constitutional and Legal Linkages (India)

- **Directive Principles of State Policy** under **Article 47** obligate the state to improve public health and nutrition, which includes control of communicable diseases like TB.
- India's National Strategic Plan to End TB by 2025 aligns with the **Sustainable Development Goals (SDG 3)** — specifically target 3.3 to end TB and other epidemics by 2030.

• Key Definitions

- **Latent TB Infection (LTBI):** When TB bacteria live in the body without causing active disease; can activate if immunity weakens (e.g., in HIV patients).
- **Drug-Resistant TB:** TB that does not respond to at least isoniazid and rifampicin, the two most powerful anti-TB drugs.

Conclusion

The resurgence of TB in the 1980s and 1990s underscored the dangers of complacency in public health. Global underestimation of TB cases highlighted the need for **continuous monitoring, data transparency, and robust healthcare infrastructure**. In India's context, achieving the ambitious goal of eliminating TB by 2025 demands strong political will, improved surveillance systems, widespread awareness, and addressing social determinants like poverty and malnutrition. The TB story serves as a reminder that elimination of infectious diseases requires **sustained commitment and adaptive strategies**, not just medical advancements.

9. Revision of Electoral Rolls: The Bihar Initiative and its National Context

• What are Electoral Rolls? (Definition & Legal Basis)

- An **electoral roll** is an official list of all eligible voters in a constituency.
- **Article 324** of the Constitution vests the superintendence, direction, and control of electoral roll preparation with the Election Commission of India (ECI).
- **Article 326** grants the right to vote to every citizen aged 18+, subject to certain conditions.
- The **Representation of the People Act, 1950 (RP Act)** governs preparation and revision; **Section 19** specifies eligibility, and **Section 20** defines 'ordinary residence'.

• Why a Special Intensive Revision (SIR)?

- **Section 21 of the RP Act** allows the ECI to conduct a special revision at any time for valid reasons.
- Massive **urbanisation and migration** over the last 20 years have led to potential **duplicate and erroneous entries**.
- Bihar, with Assembly elections due in November 2025, is chosen first. The last SIR in Bihar was in 2003.





• Process and Challenges of Current SIR

- Unlike 2003, current SIR requires each voter to submit an enumeration form and additional documents (for those enrolled post-2003) to verify **date and place of birth**.
- Concerns include logistical difficulties, especially for **migrant workers and students**, and risk of large-scale exclusions.
- Over **three crore voters** might need to submit supporting documents, posing a major administrative challenge.

• Aadhaar and Proof of Citizenship Debate

- Aadhaar is **excluded** as proof since it is not a citizenship document and explicitly states so.
- Critics argue Aadhaar is widely used, especially by marginalized groups, and excluding it may disenfranchise many.
- Under **Form 6 of Registration of Electors Rules, 1960**, Aadhaar is accepted unless unavailable, creating a legal and procedural conflict.

• Inclusion of Migrant Workers: A Key Issue

- RP Act specifies that only citizens "ordinarily resident" should be included, but migrants "temporarily absent" retain original residence rights.
- Many migrants prefer to vote in their native constituencies; forced transfer to new rolls or removal could violate their choice.
- The idea of **remote voting** for migrants has been discussed by ECI but is yet to be fully operational.

• Constitutional and Legal Context (India)

- **Article 326** guarantees adult suffrage; ensuring no eligible voter is excluded aligns with constitutional commitment to universal franchise.
- **Representation of the People (Amendment) Act, 2010** allows Non-Resident Indians (NRIs) to vote in their home constituencies, creating a precedent for migrant rights within India.

Conclusion

The SIR of electoral rolls aims to improve accuracy and prevent electoral fraud. However, it must balance **purity of rolls with inclusivity**, ensuring no genuine voter is disenfranchised, particularly vulnerable groups like migrants and the underprivileged. Strengthening processes, using technology (e.g., Aadhaar seeding for verification), and considering ground realities will be crucial. Upholding the spirit of **universal adult franchise**, a cornerstone of India's democracy under Article 326, remains paramount.

10. Cooperatives as India's Economic Backbone: Vision and Roadmap

• Importance of the Cooperative Sector

- Union Minister Amit Shah emphasized that **cooperatives should become India's economic backbone**, particularly for rural and agricultural development.



- Cooperatives are organizations owned and run jointly by their members, who share profits or benefits. They promote **collective economic strength**, self-help, and democratic decision-making.

• Three Core Principles for Cooperatives

- **Transparency:** Ensures accountability and trust among members.
- **Technology adoption:** Key to modernizing processes, increasing efficiency, and improving market competitiveness.
- **Member welfare:** Focus on placing the interests of individual members, especially farmers and laborers, at the center of all activities.

• Five-Point Roadmap for Cooperative Growth

1. **People:** Prioritize initiatives that directly benefit ordinary citizens.
2. **PACS (Primary Agricultural Credit Societies):** Strengthen grassroots-level cooperatives, crucial for agricultural credit and input supply.
3. **Platforms:** Build robust digital infrastructure to support cooperative activities nationwide.
4. **Policy reforms:** Enable modernization and remove regulatory hurdles to promote ease of doing business.
5. **Prosperity:** Aim for holistic development of entire communities, beyond individual profits.



• Institutional and Policy Achievements

- Establishment of the **Union Ministry of Cooperation in 2021**, signaling high-level focus on cooperative development.
- Registration of over **two lakh PACS**, creation of India's first **cooperative university**, and establishment of **three national-level dairy cooperatives**.
- Highlighting Amul's success story, projected to cross ₹1 lakh crore turnover, demonstrating the strength of the cooperative model.

• Constitutional and Legal Provisions

- **Article 43 of the Directive Principles of State Policy (DPSP)** urges the State to promote cooperatives to ensure economic participation and prevent concentration of wealth.
- The **97th Constitutional Amendment (2011)** gave constitutional status to cooperatives, adding **Part IXB (Articles 243ZH to 243ZT)** for cooperative societies, and inserted the word "cooperatives" in Article 19(1)(c), recognizing the right to form cooperatives as a fundamental right.
- Emphasizes democratic and autonomous functioning, accountability, and regular elections within cooperatives.

Conclusion

The cooperative sector, if effectively reformed and strengthened, has the potential to drive **inclusive and sustainable economic growth**, empower farmers and rural communities, and bridge regional economic



disparities. By focusing on technology, transparency, and member-centric welfare, cooperatives can truly serve as the **economic backbone of a self-reliant India**, aligning with the constitutional vision of social and economic justice.

I I. Environment Impact Assessment (EIA) and Nicobar Project: Key Highlights

• Context: Great Nicobar Infrastructure Project (GNIP)

- The ₹72,000-crore GNIP involves developing a **transshipment port, international airport, township development, and a 450 MVA power plant** on Great Nicobar Island (GNI).
- The project aims to strengthen strategic and economic presence in the Indian Ocean but has raised serious environmental and seismic safety concerns.

• EIA Findings and Criticisms

- The EIA report, conducted by a private consultant (Vimta Labs), states that the probability of a **mega earthquake** (like the 2004 tsunami-causing event) is "low", citing a 420–750 year return period for magnitude ≥ 9 earthquakes.
- Critics argue that the EIA **downplays risks** and does not sufficiently account for uncertainties in earthquake prediction and local fault lines.

• Key Scientific Concerns

- The **IIT-Kanpur study** revealed at least **seven large tsunamis** in the last 8,000 years around the Andaman-Nicobar region and emphasized unknown rupture lines.
- Scientists such as Prof. Javed Malik and Prof. C.P. Rajendran stress the importance of **site-specific studies** rather than broad generalizations, given the area's high geo-dynamic activity and local fault vulnerabilities.



• Definitions & Technical Terms

- **Environment Impact Assessment (EIA):** A process to evaluate the environmental effects of a proposed project before decisions are made.
- **Return period:** The average time interval between events of a certain intensity or size (e.g., earthquakes).
- **Geo-dynamic area:** Regions of active geological movement, often prone to earthquakes and land shifts.

• Constitutional and Legal Provisions

- **Article 48A** (Directive Principles of State Policy): Mandates the State to protect and improve the environment and safeguard forests and wildlife.
- **Forest (Conservation) Act, 1980:** Regulates the diversion of forest land for non-forest purposes and seeks to minimize ecological damage.



- The **National Green Tribunal (NGT)** has intervened to order a review of clearances, citing potential biodiversity loss and threats to indigenous communities.

Conclusion

The GNIP highlights the critical balance between **development and ecological sustainability**. While strategic infrastructure is essential, ignoring geological and environmental risks can endanger lives, biodiversity, and local communities. Incorporating rigorous, **site-specific seismic studies**, strict adherence to environmental laws, and meaningful tribal consultations is crucial to align with India's constitutional duty towards environmental protection and sustainable development.

12. AI and Computers: Revolutionising Ocean Studies

• The Ocean as a Dynamic System

- The ocean is not static — it "speaks" through **waves, currents, and subsurface turbulence**, influencing global weather and climate systems.
- Phenomena such as **mesoscale eddies** (large rotating water bodies) play a crucial role in redistributing **heat, nutrients, and salinity**, impacting marine life and regional climates.

• Rise of Computational Monitoring

- Traditional methods of ocean observation were limited; today, **computers powered by AI and big data analytics** decode complex ocean patterns.
- Tools include **satellites, floating buoys, and autonomous underwater vehicles**, generating continuous real-time data on temperature, salinity, chlorophyll, and currents.



• Role of Artificial Intelligence (AI)

- AI models, including **deep learning and convolutional neural networks**, can identify eddies, track upwelling zones, and detect chemical changes with high accuracy.
- AI enables **early warning systems** for cyclones, storm surges, and coastal flooding, crucial for disaster preparedness and resilience.

• Practical Applications and Benefits

- Fisherfolk receive **real-time data on fish migration**, improving livelihood security.
- Coastal planners can anticipate **erosion and flood risks**, aiding in sustainable coastal development.
- Conservationists monitor **coral reef health and pollution zones**, supporting biodiversity conservation efforts.

• Constitutional & Legal Provisions

- **Article 48A** (Directive Principles of State Policy): Directs the State to protect and improve the environment and safeguard forests and wildlife.



- **United Nations Convention on the Law of the Sea (UNCLOS):** India is a signatory, obligating responsible use and conservation of ocean resources.
- **Disaster Management Act, 2005:** Provides for effective disaster prevention, mitigation, and preparedness — ocean monitoring aligns with these objectives.

• **Key Definitions**

- **Mesoscale eddies:** Large, circular ocean currents that can be compared to underwater storms, crucial for ocean heat and nutrient transport.
- **Upwelling zones:** Areas where deep, cold, nutrient-rich water rises to the surface, supporting high marine productivity.

Conclusion

Computers and AI are transforming our relationship with the oceans by turning invisible dynamics into actionable knowledge. This technological leap strengthens climate resilience, enhances livelihood security, and supports ecosystem health. However, the true challenge lies in how we use this foresight — not merely to predict, but to act responsibly and collaboratively for a sustainable future.