

**The Hindu Important News Articles For UPSC CSE**  
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**Page 04 : GS II & III : International Relations & Science and Tech/ Preliminary Examination**

Recently, India and the United Kingdom (U.K.) have jointly and formally launched the 'Critical Minerals Global Supply Chain Observatory' (GSCO) to monitor and analyze global supply chains. This observatory was first announced in October 2025 during the U.K. Prime Minister's visit to India. In the current global geopolitical scenario, ensuring a secure supply of critical minerals (such as lithium, cobalt, nickel, etc.) for the clean energy transition, defense industries, and advanced technologies has become a major strategic necessity for both nations.

### India, U.K. launch observatory to expand critical minerals partnership

**The Hindu Bureau**  
 NEW DELHI

Seeking to expand cooperation and technology-sharing in the realm of critical minerals, India and the United Kingdom on Thursday formally launched the Critical Minerals Global Supply Chain Observatory (GSCO).

The observatory was first announced during U.K. Prime Minister Keir Starmer's visit to India in October last year with an objective to "expand mineral coverage, further integrate advanced technologies and unlock new bilateral investment opportunities".

The platform – to be jointly operated by India's Technology Innovation in Exploration & Mining Foundation (TEXMiN), Indian Institute of Technology (ISM) Dhanbad and U.K.'s University of Cambridge – will institute a data-driven platform to monitor and analyse global critical mineral supply chains.

In a social media post, Union Minister for Mines and Minerals G. Kishan Reddy wrote, "This is a major step towards strengthening critical mineral supply chains, supporting clean energy transitions, and building resilient global supply chains through the India-U.K. partnership."

**Minister meets official**

Meanwhile, during a meeting with visiting British Foreign Secretary Yvette Cooper on Thursday, External Affairs Minister S. Jaishankar said India and the U.K. were well-positioned to construct a new future-oriented and mutually beneficial partnership on the back of their newly firm-ed-up comprehensive trade deal and the defence industrial road map. Mr. Jaishankar said both sides "reviewed ongoing progress in our cooperation focusing on trade, technology, supply chains, defence, climate, education and people to people ties. Also spoke about new opportunities in clean energy, AI and critical minerals".

The two sides also exchanged views on global developments including in Ukraine, West Asia and the Indo-Pacific.

In his remarks, Mr. Jaishankar also highlighted the "remarkable developments" in the bilateral ties in recent months while pointing to Prime Minister Narendra Modi's visit to the U.K. last July, followed by U.K. Prime Minister Keir Starmer's trip to India in October.

Ms. Cooper also met Mr. Modi. "Appreciated the deepening of the India-UK partnership in recent times that has unlocked unprecedented growth opportunities for both our countries," Mr. Modi said on social media.

Ms. Cooper emphasised greater access to critical minerals and improved information-sharing would be mutually beneficial to both countries. According to the announcement readout, Ms. Cooper stated the observatory could also serve "as a foundation for broader cooperation across the critical minerals sector and related strategic industries."

*(With PTI inputs)*



Union Minister G. Kishan Reddy and U.K. Foreign Secretary Yvette Cooper launching the critical minerals observatory. ANI



**Key Points**

**1. Operation and Technical Framework of the Observatory (GSCO)**

- **Joint Academic Partnership:** This digital and data-driven platform will be operated jointly by the leading technical institutions of both countries. This includes India's 'Technology Innovation in Exploration and Mining Foundation' (TEXMiN) at IIT (ISM) Dhanbad and the U.K.'s University of Cambridge.
- **Methodology:** This observatory will closely monitor the supply chain of critical minerals on a global scale, analyze data, and identify potential bottlenecks or risks.

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## 2. Strategic and Economic Objectives

- **Supply Chain Resilience:** The primary objective of this partnership is to reduce dependence on any single country (such as China) for the supply of critical minerals and to build a resilient, reliable global supply chain.
- **Clean Energy and Technological Development:** These minerals are essential for green and advanced tech industries such as lithium-ion batteries, electric vehicles (EVs), solar panels, semiconductors, and wind turbines. This initiative supports the 'Net-Zero' climate goals of both India and the U.K.
- **New Opportunities for Bilateral Investment:** This platform will open new avenues for trade and manufacturing investments between the two countries in the critical minerals sector and related strategic industries.

## 3. Broader Context of India-U.K. Relations

This observatory is just one part of the growing bilateral cooperation between the two nations. Recent discussions also reviewed progress in the following key areas:

- **Comprehensive Trade Deal:** Both countries have made strong progress toward a Free Trade Agreement (FTA) to take their commercial relations to new heights.
- **Defence Industrial Road Map:** Both nations are promoting co-production and technology transfer in the defense sector.
- **Advanced Tech Cooperation:** Beyond critical minerals, cooperation is being expanded into futuristic domains such as Artificial Intelligence (AI), education, climate change, and clean energy.
- **Geopolitical Dialogue:** India and the U.K. also exchanged views on global issues such as the Ukraine crisis, tensions in West Asia, and security in the Indo-Pacific region.

## 4. Significance for UPSC Mains Exam (What are Critical Minerals?)

- **Critical Minerals:** These are mineral elements that are vital for a country's economic progress and national security, but their domestic availability is low, or the risk of disruption in their supply chain is exceptionally high. Examples: Cobalt, lithium, gallium, nickel, and Rare Earth Elements (REEs).

## Conclusion

The launch of the 'Critical Minerals Global Supply Chain Observatory' (GSCO) is not merely a technical collaboration between India and the U.K., but a significant milestone in emerging 'Mineral Diplomacy'. At a time when global supply chains are highly sensitive due to geopolitical conflicts, this data-driven approach by

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institutions like Cambridge and IIT Dhanbad will help both countries make proactive decisions at the policy level. For India, this partnership is a highly practical and visionary step toward securing its domestic manufacturing ambitions (such as 'Make in India' and the EV Mission) and balancing China's mineral monopoly on a global scale.

### UPSC Prelims Exam Study Questions

**Question: Consider the following statements regarding the Critical Minerals Global Supply Chain Observatory (GSCO):**

1. It is a joint initiative of India and the United Kingdom.
2. It aims to monitor and analyse global critical mineral supply chains.
3. It is jointly operated by IIT (ISM) Dhanbad and the University of Cambridge.
4. Its primary objective is to promote fossil fuel-based industries.

**Which of the statements given above are correct?**

- (a) 1, 2 and 3 only  
(b) 1 and 4 only  
(c) 2 and 3 only  
(d) 1, 2, 3 and 4

Ans: (a)

### UPSC Mains Practice Questions

**Question:** India-UK cooperation in critical minerals reflects the emergence of "Mineral Diplomacy" in contemporary international relations. Examine.(15Marks, 250Words)

**Page 06 : GS II : Indian Polity/ Preliminary Examination**

In this era of technological advancements, the application of Artificial Intelligence (AI) in the judiciary has emerged as a subject of significant debate. Recently, the Supreme Court's AI Committee released the initial draft of the 'Regulations for the Use of Artificial Intelligence (AI) in Courts, 2026'. The primary objective of this draft is to restrict the role of AI in judicial processes strictly to an 'assistive' capacity, ensuring it remains subordinate to human judgment and judicial authority. This proactive measure has been taken in light of the growing concerns over courts relying heavily on AI for adjudication in recent months.

## Draft SC rules prohibit use of AI for judicial outcomes, witness profiling

They underline that AI systems used in court processes must 'function solely in an assistive capacity' and remain 'strictly subservient to human judgment and judicial authority'; comments and suggestions invited from the public till June 20

**Aaratrika Bhaumik**  
NEW DELHI

**P**rohibiting the use of artificial intelligence (AI) to determine judicial outcomes, the Supreme Court AI committee has proposed draft regulations that bar AI-assisted sentencing without mandatory human oversight, prevent AI systems from profiling parties or witnesses, and disallow the use of "opaque" or "unexplainable" AI systems in any court process.

The proposed regulations come amid concerns expressed by the top court in recent months over the growing reliance on AI by courts in rendering judgments. In March, a Bench headed by Justice P.S. Narasimha chided a trial court for relying on non-existent judgments generated with the help of AI, observing that it was not merely "an error in decision-making" but amounted to judicial "misconduct".

The preliminary draft of the 'Regulations for Use of Artificial Intelligence (AI) in Courts, 2026', made pu-



The draft regulations permit the use of AI for administrative functions such as case listing and scheduling. GETTY IMAGES/ISTOCK

blic on Wednesday, underlines that AI systems used in court processes must "function solely in an assistive capacity" and remain "strictly subservient to human judgment and judicial authority".

The committee, chaired by Supreme Court judge Justice P.S. Narasimha and comprising Justices Sanjeev Sachdeva, Raja Vijayaraghavan V., Anoop Chitkara and Suraj Govindaraj, has invited comments and suggestions from stakeholders as well as members of the public on the draft regulations before they are finalised.

The deadline for sub-

mitting responses is June 20. Under the draft regulations, the processing of personal data through AI systems shall be governed by the provisions of the Digital Personal Data Protection Act, 2023. It also underlines that AI systems must not "perpetuate, amplify, or introduce bias" on grounds of race, religion, caste, sex, gender, disability, language, economic status, or any other ground prohibited under the Constitution.

### 'Human-in-the-loop'

"Applications involving higher levels of risk to personal liberty, any lawful

right of a person, or the integrity of judicial outcomes shall be subject to correspondingly heightened safeguards, including mandatory human-in-the-loop requirements and independent oversight," the draft states.

It further cautions that AI-assisted judicial systems should not "widen digital divides" and must remain accessible to all stakeholders, including those from rural, economically disadvantaged, or linguistically diverse communities.

While the draft regulations permit the use of AI for administrative functions such as case management, preparation of cause lists, scheduling of hearings, transcription of court proceedings and translation of judgments, they make it clear that AI systems cannot be used for "risk scoring" in court processes. This includes assessing flight risk, predicting recidivism, evaluating bail eligibility, or determining the credibility of parties or witnesses.

It also bars authorities from using AI systems for the surveillance or contin-

uous monitoring of judicial officers, advocates, litigants and other stakeholders, "except as may be specifically authorised by applicable law for the time being in force".

### 'Apex body'

To supervise the adoption of AI in the judiciary and steer standard-setting and policy development, the draft regulations propose the creation of a full-time "apex body" at the Supreme Court.

The apex body, it recommends, would comprise two Supreme Court judges nominated by the Chief Justice of India (CJI), one of whom shall serve as the ex-officio chairperson; two High Court Chief Justices and two High Court judges nominated by the CJI; one member from an institution of national importance or any institution of repute, as nominated by the CJI; an officer not below the rank of Joint Secretary in the Ministry of Electronics and Information Technology; a finance expert and a cybersecurity expert nominated by the CJI; among others.

### Key Points

#### 1. Background and Immediate Trigger

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- **Case of Judicial Misconduct:** In March 2026, the Supreme Court pulled up a trial court for delivering a judgment based on fictitious and non-existent rulings generated by AI. The apex court categorized this not merely as an error in decision-making, but as an act of "judicial misconduct."
- **Constitution of the Committee:** This draft has been formulated by a committee chaired by Supreme Court Judge, Justice P.S. Narasimha. The committee has invited suggestions and feedback from the general public and stakeholders until June 20, 2026.

## 2. Core Prohibitions Under the Draft Rules

To preserve the impartiality and integrity of justice, the draft imposes a blanket ban on the following applications of AI:

- **Determination of Judicial Outcomes:** AI cannot be utilized to decide final court verdicts, judgments, or sentencing.
- **Profiling of Witnesses and Parties:** AI-driven profiling to assess the credibility of witnesses or litigants involved in lawsuits is strictly prohibited.
- **Ban on Opaque Systems:** The use of "black-box" or unexplainable AI systems—whose internal logic, methodology, or source coding cannot be understood or verified—will not be permitted.
- **Risk Scoring:** AI cannot be deployed to determine bail eligibility, predict recidivism (an offender's tendency to reoffend), or calculate the flight risk of an accused person.
- **Illegal Surveillance:** The deployment of AI for the continuous monitoring or surveillance of judicial officers, lawyers, and litigants is completely barred.

## 3. Permitted Administrative Uses of AI

To streamline court operations and reduce bureaucratic friction, the administrative and non-judicial use of AI has been permitted in the following areas:

- Case management, scheduling, and tracking of lawsuits.
- Preparation and automated generation of daily Cause Lists.
- Real-time transcription of court proceedings.
- Translation of court judgments and orders into various regional languages.

## 4. Core Guiding Principles and Safeguards

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- **Human-in-the-Loop:** In cases where individual liberty, legal rights, or the veracity of judicial outcomes carry high stakes, a 'human-in-the-loop' approach (mandatory human intervention in final decisions) and independent oversight will be strictly enforced.
- **Freedom from Institutional Biases:** AI systems must ensure they do not perpetuate, learn, or reinforce biases based on caste, religion, race, gender, language, disability, or socio-economic status.
- **Data Sovereignty:** The processing of personal data by AI inside courtrooms will be strictly governed by the statutory provisions of the 'Digital Personal Data Protection (DPDP) Act, 2023'.
- **Bridging the Digital Divide:** It will be dynamically ensured that AI-assisted judicial tools do not become barriers for rural, economically weaker, or linguistically diverse communities, thereby avoiding any amplification of the digital divide.

### 5. Proposed Institutional Framework: The 'Apex Body'

The draft proposes the setting up of a full-time institutional 'Apex Body' within the Supreme Court to oversee AI deployment, develop policies, and establish benchmark standards:

- **Chairmanship:** A sitting Supreme Court judge, nominated by the Chief Justice of India (CJI), will serve as its ex-officio Chairperson.
- **Composition:** The body will comprise other judges from the Supreme Court and High Courts, joint-secretary level officers from the Ministry of Electronics and Information Technology (MeitY), domain experts from institutes of national importance, financial experts, and cybersecurity analysts.

### Conclusion

The draft rules released by the Supreme Court's AI Committee represent a highly progressive and balanced stride toward safeguarding the nation's judicial sanctity from the unregulated impacts of technology. In the eyes of law, every legal case is unique, demanding human empathy, conscience, and deep contextual understanding of social realities—elements that data-driven algorithms can never replicate. While the administrative deployment of AI can prove revolutionary in clearing the massive backlog of pending cases, keeping AI strictly "subordinate" to human discretion in judicial adjudication is absolute for upholding the Rule of Law and the principles of natural justice.

**UPSC Prelims Exam Study Questions**

**Question:** Consider the following statements regarding the Draft Regulations on the Use of Artificial Intelligence in Courts, 2026:

1. AI can be used to determine judicial outcomes and sentencing.
2. AI can be used for real-time transcription of court proceedings.
3. AI-based profiling of witnesses and litigants is prohibited.
4. AI can be used for preparation of cause lists.

**Which of the statements given above are correct?**

- (a) 2, 3 and 4 only  
(b) 1 and 2 only  
(c) 1, 3 and 4 only  
(d) 1, 2, 3 and 4

Answer: (a)

**UPSC Mains Practice Questions**

**Question:** Artificial Intelligence can improve judicial efficiency, but excessive reliance on it may undermine the principles of natural justice and judicial accountability. Examine.(15Marks, 250 Words)

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**Page 07 : GS II :Social Justice/ Preliminary Examination**

A recent joint study conducted by CMC Vellore and TIFR's 'ARUMDA' institute, along with the latest data from the National Family Health Survey (NFHS-6), points toward a fresh and severe crisis on India's nutritional security front. India is currently grappling with the 'Double Burden of Malnutrition'. While the challenges of undernutrition (stunting, wasting, and underweight) persist, the menace of overnutrition (overweight and obesity) is escalating rapidly. This long-term study from Vellore reveals a startling fact: the divergence toward thinness and obesity begins to accelerate at an early school-going age of 7 to 9 years.

**Key Points**

**1. Core Findings of the Vellore Study (MAL-ED)**

The study tracked 251 children living in a low-income urban slum setting in Vellore from birth up to the age of 9 years, revealing the following trends:

- Early-Stage Stunting:** At 2 years of age, approximately 45% of the children were stunted. However, nearly 80% of these children managed to catch up on their linear growth by the age of 9.
- Status at 7 Years:** By this age, 26.3% of the children were classified as severely thin, while 5.2% had already fallen prey to overweight or obesity.
- Status at 9 Years (The Sharp Spike):** By the age of 9, while the share of underweight children stood at 21.6%, the graph of overweight and obese children witnessed a steep rise, reaching 14.6%.
- Inference:** Nutritional vulnerabilities are not restricted merely to toddlers; rather, the crisis rapidly transforms into overnutrition during early school-going years (7–9 years).

**2. Trans-generational Burden**

### Evolving public health strategies to address under and over nutrition

A recent study conducted in Vellore found that prevalence of thinness and overweight began to rise sharply between ages seven and nine; double burden of malnutrition is a cause of concern in India and needs to be addressed; programmes designed primarily to combat undernutrition need to be re-thought



**THE GIST**

According to the World Health Organization (WHO), malnutrition includes undernutrition (stunting, wasting, underweight), inadequate vitamins or minerals, overweight, obesity, and results in diet-related non-communicable diseases.

Children in low/middle-income urban communities are facing both thinness and obesity by school age. A collaborative study between CMC-Vellore and ARUMDA at TIFR finds. One author of the paper, said the surprise element of the study was not that children born with low birth weight were becoming obese, but the fact that weight related issues begin to early in children.

A one-sided intervention – addressing only undernutrition, and not overnutrition would be a mistake that the country can scarcely afford to make at this stage, loaded as it is with huge burdens of metabolic disorders including insulin resistance and hypertension

**Catching them young:** The Vellore study brings new findings from a collaborative study between CMC Vellore and ARUMDA at TIFR, and highlights a critical shift in India's nutrition challenge. (NLS:MOFO)

trans-generational burden in India. Maternal weight is clearly an important factor in foetal and child health, as well, but one that has not been sufficiently examined by policy makers in the form of maternal health interventions.

**Surprise element**  
Ulas Kolhar of ARUMDA, TIFR, one of the authors of the paper, said the surprise element of the study was not that children born with low birth weight were becoming obese, but the fact that weight related issues begin so early in children.

Becna Koshy, of CMC Vellore, highlights the importance of monitoring children's growth after the first 1000 days after birth. "This is a cohort in a low-income, urban setting in Vellore, which is part of our MAL-ED group, being studied for years. In these communities, children are facing thinness, yes, but also obesity even before they enter the teens."

She explains that in the study location, the mean birth weight is 2.7 kg and 1% of children are born with low birth weight. At age two, about 45% of children are stunted, but 80% of the children have caught up by age nine. "This means the nutrition issue we face today is not only about underweight toddlers, but the entire range of nutrition sufficiency or insufficiency through childhood."

It also means our understanding of malnutrition has not been on point, or, is no longer on point. India which has had a long track record of undernutrition, wasting and stunting has come to look upon malnutrition as exclusively residing in this quarter. More recent evidence shows that it is no longer that simple at all, that there are nuances that we might be missing in childhood.

Dr. Kolhar adds, "What is malnutrition? How must it be handled? We know now, from this study, that feeding all children the same diet might not be such a great idea after all. There must be differentiation in how we tailor the diets of children, early on." Dr. Koshy points out that the easy availability of packaged foods, sugary drinks and deep fried food in sachets have a huge role to play. "While these foods are available cheap, the access to healthy fruits, vegetables and proteins is still not very good."

What Thomas, senior professor of Endocrinology at CMC Vellore, who was instrumental in leading efforts to offer a differential diagnosis of 'lean diabetes' (Type 5), points out that undernutrition in early life can lead to two potential trajectories. On one hand, the persistence of undernutrition, besides leading to stunting, can potentially lead to defects in insulin secretion and even situations where lean individuals develop diabetes in relation to malnutrition. On the contrary, in those with overnutrition, there is the danger of increase in overweight and subsequently increasing the risk of diabetes, hypertension and cardiovascular disease, he explains.

**Addressing the issue**  
At this juncture, public health experts urge a full complement of health policies that will address a judicious blend of both dietary interventions to tackle undernutrition and lifestyle interventions, including improving diet and activity. A one-sided intervention – addressing only undernutrition, and not overnutrition would be a mistake that the country can scarcely afford to make at this stage, loaded as it is with huge burdens of metabolic disorders including insulin resistance and hypertension.

The EMO has meanwhile recommended, based on case studies from six countries, that programmes once designed primarily to combat undernutrition (ICDS, school meals, PDS) now need to be re-thought to address both inadequate calories/micronutrients and poor quality, ultra processed, high-sugar, high-fat diets. (www.koshyendobooks.com)

- **Impact of Maternal BMI:** The study established that a mother's Body Mass Index (BMI) serves as a potent indicator of a child's thinness.
- **The NFHS-6 Correlation:** Data from NFHS-6 indicates that 30.7% of Indian women aged 15–49 years are overweight or obese, marking a significant jump from the 24% recorded in NFHS-5. An unhealthy or malnourished mother directly compromises fetal and early childhood health, effectively transferring the metabolic crisis from one generation to the next.

### 3. Determinants of the Double Burden of Malnutrition

- **Accessibility of Cheap Ultra-Processed Foods:** In low-income urban clusters, affordable pouches of packaged foods, highly sweetened beverages, and deep-fried items are ubiquitous and easily accessible.
- **Unavailability of Nutritious Diets:** Conversely, accessing fresh fruits, vegetables, and high-quality proteins remains prohibitively expensive and logistically challenging for economically vulnerable segments.
- **Uniformity in Dietary Interventions:** While every child has a distinct physiological makeup and nutritional requirement, state-led nutritional interventions have largely adhered to a rigid, "one-size-fits-all" dietary framework.

### 4. Associated Health and Metabolic Vulnerabilities

Undernutrition during early development leads to two highly perilous health trajectories later in life:

- **Lean Diabetes (Malnutrition-Related Diabetes):** Persistent undernutrition impairs pancreatic insulin secretion, triggering a high risk of 'Lean Diabetes' (Type 5) even among thin and underweight individuals.
- **Non-Communicable Diseases (NCDs):** On the flip side, children who experience overnutrition due to caloric surplus face an exponentially higher risk of developing hypertension, type-2 diabetes, and cardiovascular diseases upon reaching adulthood.

### 5. Institutional Shift Required in Existing Strategies

- **Monitoring Beyond the First 1,000 Days:** India's flagship nutritional policies are overwhelmingly centered on the first 1,000 days of life (from conception to 2 years of age). The Vellore study underscores that continuous growth monitoring is indispensable beyond this window, as the real metabolic divergence manifests during the school-going years.
- **Restructuring Conventional Welfare Schemes:** The Food and Agriculture Organization (FAO) of the United Nations recommends restructuring legacy schemes originally designed solely to combat hunger

and undernutrition—such as ICDS (Anganwadis), PM POSHAN (Mid-Day Meal), and the Public Distribution System (PDS). These interventions must shift away from merely boosting caloric intake and actively discourage the consumption of low-quality, high-fat, and high-sugar foods.

### Conclusion

The definition of malnutrition in India is no longer confined to the archetype of a "hungry and frail child"; it has morphed into a complex web of insulin resistance and childhood obesity. Unidimensional public health interventions that target only undernutrition risk inadvertently pushing the nation into a massive non-communicable disease (NCD) crisis. Going forward, India requires an Integrated Nutrition Policy that simultaneously fosters dietary diversity and a healthy lifestyle (physical activity alongside balanced nutrition). Interventions like incorporating millets, local fruits, and diverse proteins into the Mid-Day Meal and PDS, coupled with fiscal measures like a 'Fat Tax' on packaged junk food, could prove to be game-changers in mitigating this double burden.

### UPSC Prelims Exam Study Questions

**Question: "Double Burden of Malnutrition" refers to:**

1. Simultaneous prevalence of undernutrition and overnutrition in a population.
2. Coexistence of stunting and obesity within the same country.
3. Presence of communicable and non-communicable diseases together.

**Select the correct answer:**

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Answer: a)**

### UPSC Mains Practice Questions

**Question:** India is witnessing a transition from traditional undernutrition to a "double burden of malnutrition". Examine the causes and suggest suitable policy interventions. **(15 Marks, 250 Words)**

**Page 09 :GS III :Environment/ Preliminary Examination**

According to the renowned anthropologist Anna Tsing, "The Anthropocene is the era in which human disturbance outpaces other geological forces... and without planning or intent, humans have made a mess of our planet." India is currently navigating this very crisis, where environmental degradation has surpassed human control and intent. Against this backdrop, to strike a balance between India's rapid economic growth and environmental sustainability, there is an urgent need to implement an independent and comprehensive 'Annual Environmental Survey of India' (EnvSI).

*A national environmental survey whose time came*

**A**nthropologist Anna Tsing writes, "Anthropocene, <is> the epoch in which human disturbance outranks other geological forces.....although some interpreters see the name as implying the triumph of humans, the opposite seems more accurate: without planning or intention, humans have made a mess of our planet." It is in this precise predicament that India finds itself: environmental damage has slipped beyond intention and control, belonging to no one entirely and to everyone at once.

**An unfolding crisis**

A survey by the Yale School of the Environment of 10,751 Indians (December 2024-February 2025) found that most respondents had experienced at least one extreme event, including heat waves (71%), agricultural pests and diseases (60%), power outages (59%), water pollution (53%), droughts and water shortages (52%), and air pollution (52%). Based on Indian meteorological department and State of India's Environment findings, nearly half of the 37% of 870 river-monitoring stations recorded alarming levels of toxic heavy metals. Air pollution in 2022 reduced average life expectancy by about three years, while some parts of the country experienced extreme weather for nearly 88% of the year. The Desertification and Land Degradation Atlas of India estimates that 29.7% of the country's land is degraded. Yet, despite this mounting environmental crisis, India still lacks a comprehensive understanding of the state of its environment.

In India, the environment sits on the back bench – starved of funds, with only 0.07% of the annual budget allocated to the Ministry of Environment, Forest and Climate Change (MoEFCC), understaffed, and intellectually neglected. Its custodians often work in silos with overlapping jurisdictions. The result is ignorance masquerading as knowledge. The MoEFCC's annual reports outline forest-restoration



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A credible environmental survey is essential for informed policymaking

initiatives such as the National Afforestation Programme (NAP) and REDD+ (reducing emissions from deforestation and forest degradation in developing countries '+ additional forest-related activities that protect the climate), yet say little about the scale of State-wise deforestation, its impact on biodiversity and livelihoods, or the country's preparedness for future environmental challenges. Beyond these omissions, the reports often obscure the nuances behind impressive plantation figures, sidestep scrutiny of fund utilisation and environmental compliance, and overlook findings from global assessments.

**The case for EnvSI**

Much of this information is already measured by governments, think tanks, educational institutions and private actors, but it remains fragmented. What is missing is not data, but a system that brings it together. The remedy is to have an Annual Environmental Survey of India (EnvSI): a unified platform that aggregates evidence, conducts independent audits, issues actionable assessments and grades performance. EnvSI must provide an unsparing account of environmental reality – however uncomfortable. The objective is not merely to document what has been lost, but to identify what can still be protected.

Drafting an EnvSI would require a clear statutory mandate, functional autonomy and protected tenure for an expert-led body. It should integrate data from government agencies, independent researchers, the private sector and field-based evidence. Its methodology must combine quantitative indicators with livelihood assessments, using cross-verified datasets and rigorous analysis. Some may question the cost.

The answer is simple: the cost of not doing it is far greater, and doing it would bring some reason to the redundancy of surveying efforts. An EnvSI

could deliver four key benefits. First, it would help prevent further environmental degradation, temper climate-driven disasters, and build resilient responses through coordinated action and better resource use. Second, it would support the timely achievement of climate targets, enhance credibility and unlock climate finance. Third, it would better align economic development with conservation, while protecting tribal rights, traditional livelihoods and the interests of displaced communities. Finally, it would strengthen the commons by recognising and safeguarding the interdependence between ecosystems, species and human societies.

Finally, the template for an EnvSI already exists. The Economic Survey of India offers the Environment Ministry its clearest model: an integrated report prepared by experts under the Chief Economic Adviser, independent enough to present inconvenient truths. It draws on multiple sources, rigorously scrutinises evidence, rejects comforting narratives, and alerts policymakers to emerging challenges and necessary reforms. India constantly faces difficult trade-offs between development and conservation.

**Keeping nature in sight**

Home to one-sixth of humanity on just 4% of the earth's land area, India must pursue growth while meeting climate commitments. In such circumstances, environmental concerns are often pushed to the margins. An independent and audacious EnvSI can help balance growth, sustainability, livelihoods and justice. Without India's full commitment, global climate goals will remain elusive. More importantly, an EnvSI can make visible the environmental changes that have become normalised, helping build the awareness needed to protect what remains.



**Key Points**

**1. The Unfolding Environmental Crisis in India**

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Data from the Yale School of the Environment (Yale Survey 2024-25) and other official sources highlight the alarming state of India's environment:

- **Experience of Extreme Weather Events:** Approximately 71% of Indians have experienced intense heatwaves, 60% have faced agricultural pests and diseases, 52% have encountered droughts and water scarcity, and 52% have suffered from severe air pollution.
- **Depletion of Resources:** Hazardous levels of 'toxic heavy metals' have been detected in the waters of nearly half of India's 870 river-monitoring stations. Additionally, 29.7% of India's total land area is undergoing land degradation and desertification.
- **Reduction in Life Expectancy:** According to data from 2022, air pollution has shortened the life expectancy of an average Indian by approximately three years.

## 2. Existing Institutional and Policy Gaps

According to the author, the environment has been marginalized within the Indian administrative framework due to the following primary factors:

- **Fiscal Neglect:** The Ministry of Environment, Forest and Climate Change (MoEFCC) is allocated a mere 0.07% of the nation's annual budget, leaving the ministry severely underfunded and understaffed.
- **Working in Silos:** The country's environmental regulatory and protective agencies operate in isolated silos, leading to overlapping jurisdictions and a lack of clear accountability.
- **Lack of Transparency:** While the annual reports of the MoEFCC project impressive afforestation figures under programs like the National Afforestation Programme (NAP) and REDD+, they often obscure the actual scale of state-wise deforestation, its adverse impact on biodiversity, and the resulting livelihood crises of displaced communities.

## 3. Proposed Structure and Blueprint of EnvSI

The challenge in India is not a scarcity of data—governments, think tanks, and academic institutions possess a wealth of information—but rather the lack of a centralized platform to consolidate this fragmented data. The structure of the proposed EnvSI should feature:

- **Statutory Mandate:** This expert-led body must possess clear legal authority, functional autonomy, and security of tenure.
- **Integrated Methodology:** It will synthesize cross-verified quantitative indicators from government agencies, independent researchers, and the private sector, along with field-based livelihood assessments.

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- **The Economic Survey Model:** Just as the 'Economic Survey' prepared under the guidance of the Chief Economic Advisor (CEA) unflinchingly highlights economic shortfalls and bitter truths, the EnvSI must also present an unfiltered account of the nation's true environmental health, free from political interference.

#### 4. Four Core Benefits of Implementing EnvSI

- **Disaster Management and Resilience:** It will aid in preventing future climate-induced disasters and deceleration of environmental degradation through coordinated action and optimized resource utilization.
- **Global Credibility and Climate Finance:** Establishing a transparent and reliable database will enhance India's international standing, thereby unlocking pathways for global climate finance and green investments.
- **Protection of Livelihoods and Human Rights:** It will serve to balance economic development with tribal rights, traditional livelihoods, and the welfare of displaced communities.
- **Contribution to Global Goals:** Housing one-sixth of the world's population on just 4% of the Earth's landmass, global climate targets (such as the Paris Agreement) can never be achieved without India's active participation. EnvSI will streamline this pathway.

#### Conclusion

The greatest challenge before India lies in managing the difficult trade-offs between development and conservation. The tendency to marginalize the environment in the blind pursuit of economic growth can only be arrested by an independent, courageous, and statutorily robust 'Annual Environmental Survey of India' (EnvSI). This survey will not merely document environmental degradation; it will serve as a strategic alarm warning policymakers of impending vulnerabilities. The time has come for India to make nature visible within its mainstream economic policies, for the cost of conservation is far less than the future price of ecological collapse.

**UPSC Prelims Exam Study Questions**

**Question: Consider the following statements regarding the proposed Annual Environmental Survey of India (EnvSI):**

1. It is proposed on the lines of the Economic Survey of India.
2. It aims to integrate environmental data from multiple agencies and institutions.
3. It is intended to function as an autonomous and expert-led body.
4. Its primary purpose is to grant environmental clearances to projects.

**Which of the statements given above are correct?**

- (a) 1, 2 and 3 only
- (b) 2 and 4 only
- (c) 1, 3 and 4 only
- (d) 1, 2, 3 and 4

**Answer: a)**

**UPSC Mains Practice Questions**

**Question:**Environmental degradation is increasingly emerging as a constraint on India's developmental aspirations. In this context, examine the need for an Annual Environmental Survey of India (EnvSI). **(15Marks, 250 Words)**

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In India, extreme heat and erratic monsoon rains are often dismissed as mere vagaries of nature. However, in the current scenario, climate risk is rapidly transforming into an economic risk. According to a report by the US National Oceanic and Atmospheric Administration (NOAA - 2026), there is a 96% probability of El Niño returning in 2026. Concurrently, the India Meteorological Department (IMD) has projected a below-normal monsoon (92%) for this year. This situation is not merely a meteorological disruption; it is a profound 'development crisis' that exposes the structural vulnerabilities of India's informal economy.

# The power of mangroves over seawalls

India's coastline relies on seawalls and embankments, while Ecosystem-based Adaptation through mangroves, seagrasses and coral reefs continues to reduce climate risks



**Jui Gusani**  
Postgraduate from the Indian Institute of Forest Management, Bhopal, and was formerly an intern at the Sustainable Futures Collaborative

**W**hen Cyclone Dana made landfall near Bhitarkanika on Odisha's coast, the region's mangroves quietly provided a form of protection that billions of rupees in coastal infrastructure often struggle to deliver: reducing climate impacts while strengthening ecosystems and livelihoods. Across India's coastline, mangroves, seagrass meadows, and coral reefs are already helping communities adapt to rising climate risks. Yet seawalls, groynes, and embankments continue to dominate adaptation spending, even though they can be costly to maintain and sometimes transfer risks elsewhere. Despite their proven benefits, these ecosystem-based interventions are rarely recognised as Ecosystem-based Adaptation (EbA), limiting their visibility in adaptation planning and finance.

For millions living along India's coastline, climate change is already a lived reality. From rising sea levels across the Arabian Sea and the Bay of Bengal to saline intrusion, intensifying cyclones and storm surges, climate change is multiplying threats along India's 11,000-kilometre coastline. These interacting hazards not only reshape the ecologically fragile coastal

landscape but also directly upend the lives, livelihoods and homes of around 250 million people. In this context, EbA offers a promising strategy for reducing climate risk while sustaining the ecosystems that support fisheries, agriculture, and tourism.

India's coastal adaptation landscape reveals a stark preference for engineered measures such as seawalls, groynes, embankments, and tetrapods. This preference is also reflected in public spending. While coastal States spent ₹2,641 crore on hard protection measures over the last decade, the National Coastal Mission's budget fell from ₹195 crore in 2022-23 to ₹50 crore in 2024-25. Although grey measures remain necessary and effective in many high-density urban contexts, they are expensive to maintain and can displace underlying risks rather than resolve them. In Kerala, for example, hard armouring along eroding coastlines has protected specific sites while accelerating erosion and damage in adjacent areas.

**Untapped adaptation asset**  
EbA uses biodiversity and ecosystem services to help people adapt to climate change. India's coastline hosts a range of ecosystems, including mangroves,



**Green refuge:** Across India's coastline, mangroves, seagrass meadows, and coral reefs are already helping communities adapt to rising climate risks. GETTY IMAGES

seagrasses, coral reefs, and wetlands, that act as natural buffers against climate impacts. Research identifies India as a global 'hot-spot' for coastal EbA, with mangroves protecting more people per hectare than almost any other country. Yet this ecological shield remains an underutilised asset in India's climate resilience strategy.

The benefits of EbA are already visible on the ground. In the Sundarbans, for instance, over 18,000 women restored 4,600 hectares of mangroves, blunting the devastation of cyclones Amphan and Yaas. The restoration also streng-

thened livelihoods through activities such as honey collection and crab farming, highlighting EbA's social and economic co-benefits.

EbA remains peripheral to India's adaptation agenda. Fragmented mandates, weak monitoring, and a preference for visible infrastructure often leave ecosystem-based interventions buried within broader sectoral programmes rather than recognised as adaptation in their own right.

The most overlooked barrier, however, is the ambiguity surrounding the term EbA. The policy space is crowded with overlapping

concepts such as Nature-based Solutions (NbS), Ecosystem-based Coastal Adaptation (EbCA), Ecosystem-based Disaster Risk Reduction (Eco-DRR), and other ecosystem-centred approaches, creating uncertainty about what qualifies as EbA. Additionally, many ecosystem-based interventions are implemented through broader development, conservation, or restoration programmes, with their adaptation benefits rarely assessed or recorded separately. As a result, many coastal EbA interventions remain concealed within sectoral initiatives or generic policy categories, making India's coastal EbA portfolio appear much weaker than it truly is.

**Why classification matters**

The Mangrove Initiative for Shoreline Habitats & Tangible Incomes programme illustrates the disconnect. It aims at restoring 540 square kilometres of mangroves across nine States. Although designed to protect coastal communities from the impacts of climate change, it is primarily framed as a restoration programme. Without clear recognition and classification, many EbA interven-

tions remain fragmented across different labels and schemes. Clear classification helps identify, monitor, and evaluate adaptation outcomes while ensuring that the socio-economic benefits of EbA are properly reflected in planning and finance. This matters even more as the Global Goal on Adaptation has renewed attention to how adaptation outcomes are measured and reported. Without clear ways of identifying and tracking EbA interventions, India risks undercounting some of its most effective climate responses.

While this may appear to be a question of terminology, it carries real policy consequences. For better adaptation action, India must move from dispersed projects to a coherent strategy that embeds EbA within coastal planning and adaptation policy. The challenge is no longer whether ecosystem-based adaptation works but whether our policy frameworks are prepared to recognise, measure, and scale it. By operationalising EbA as a core climate and development strategy, India can reposition its natural capital as one of its most resilient and equitable lines of defence.



**Key Points**

**1. El Niño and the Economic Transmission Mechanism**

Climate shocks do not remain confined to the atmosphere; they swiftly infiltrate the labor market, agricultural mandis (markets), domestic kitchens, and urban pathways. In India, El Niño triggers economic distress primarily through three transmission channels:

- **A. The Heat Economy and Productivity Loss:** A vast majority of employment in India is informal and directly exposed to weather conditions. Construction workers, delivery riders, street vendors, and agricultural laborers cannot escape intense heatwaves. Severe heat stress diminishes worker productivity, reduces working hours, and deepens income insecurity for millions of daily wage earners.

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- **B. Impact on Agricultural Production and Rural Economy:** The South-West monsoon accounts for nearly 70% of India's annual rainfall, which is indispensable for irrigating crops and recharging reservoirs and aquifers. When rainfall becomes erratic due to El Niño, crop sowing becomes highly risky, irrigation costs escalate, and the over-extraction of groundwater accelerates. This deals a direct blow to the financial stability of small and marginal farmers.
- **C. Food Inflation and Price Shocks:** According to the Ministry of Statistics and Programme Implementation (MoSPI), food inflation rose to 4.2% in April 2026. A weak monsoon can further amplify this price pressure. Heightened crop stress triggers a rapid spike in the prices of vegetables, pulses, and other essential commodities, directly impacting the kitchen budgets of economically vulnerable households across the country.

## 2. The Policy Dilemma for Policymakers

A climate shock like El Niño creates a complex balancing act for the nation's economic policymakers. It strikes a dual blow: on one hand, it dampens the country's economic growth rate, and on the other, it intensifies inflationary pressures. In economics, this phenomenon is characterized as stagflationary pressure.

## 3. Rising Urban Inequalities

Driven by rapid concretization and depleting green cover, Indian cities are fast transforming into 'heat traps' (Urban Heat Islands). The burden of this environmental crisis is distributed unequally across society. Affluent families adapt through better housing and air-conditioning, whereas low-income urban settlements bear the brunt of overcrowding, water scarcity, and prolonged exposure to scorching heat. Climate change is thus widening the chasm of urban inequality.

## Way Forward / Key Adaptation Measures

*Aim, Think & Achieve*

To mitigate climate risks and shield the informal sector, India must implement the following strategic measures:

- **Developing Heat-Resilient Cities:** Urban planning must prioritize cool roofing, green corridors, and the rejuvenation of urban water bodies to counteract the Urban Heat Island effect.
- **Worker Protection Frameworks:** It is essential to introduce flexible working hours during peak heat periods for informal sector workers, mandate shade and clean drinking water facilities at workplaces, and implement welfare schemes like 'Heat Insurance'.
- **Optimized Water Management:** In anticipation of deficient monsoon rainfall, promoting rainwater harvesting, micro-irrigation systems (such as drip and sprinkler irrigation), and the timely desilting of reservoirs is imperative.
- **Climate-Smart Agriculture:** Farmers should be incentivized and supported to switch to heat-tolerant and water-efficient crops, particularly millets (coarse grains).

## Conclusion

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El Niño is no longer just a meteorological or geographical phenomenon; it has evolved into a mainstream macroeconomic challenge. Since the most brutal consequences of this crisis fall upon the most vulnerable and marginalized sections of society, its resolution demands a multi-dimensional development approach. The government must transition beyond immediate relief measures (such as subsidies or foodgrain distribution) and invest heavily in long-term climate adaptation policies. India cannot achieve its Sustainable Development Goals (SDGs) without safeguarding its informal economy and workforce. Therefore, integrating climate risk into mainstream economic and budgetary planning is the need of the hour.

### UPSC Prelims Exam Study Questions

**Question: Consider the following statements regarding El Niño:**

1. It is associated with abnormal warming of surface waters in the central and eastern Pacific Ocean.
2. It generally weakens the Indian Summer Monsoon.
3. It always causes drought in India.

**Which of the statements given above are correct?**

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2 and 3

**Answer: a)**

### UPSC Mains Practice Questions

**Question:**Climate risks are increasingly transforming into economic risks in India. Examine the impact of El Niño on agriculture, inflation and the informal economy. **(15 Marks, 250 Words)**

## Funding India's climate future, a trillion-dollar question

There is one figure that should command the attention of every policymaker, banker, and financial expert in India. India will require ₹162.5 trillion – roughly \$2.5 trillion – by 2030 to meet its Nationally Determined Contributions. Over the longer term, the cost of achieving net-zero emissions by 2070 is estimated at \$10.1 trillion, nearly three times India's current GDP.

This is not a counsel of despair. India has more tools to bridge this gap than it has deployed so far. But doing so requires a clear financing strategy and the institutional resolve to build mechanisms that can mobilise capital at scale.

### The financing gap

Decarbonising just four sectors – steel, cement, power, and road transport, which together account for more than half of India's carbon emissions – will require \$467 billion in additional capital expenditure between 2022 and 2030, roughly \$54 billion annually, or 1.3% of GDP. These are sectors where the private sector will not lead without strong regulatory incentives, because the economics of green steel and green cement simply do not yet work without policy support.

By 2030, developing economies are estimated to need \$5 trillion to \$6 trillion for climate action. The developed world promised \$100 billion annually at Paris – and missed it. The Baku New Collective Quantified Goal (NCQG) commits \$300 billion by 2035 – which India rightly considers insufficient. The Reserve Bank of India (RBI)'s own Report on Currency and Finance estimates that India needs an additional annual investment of at least 2.5% of GDP for green financing until 2030.

The international community will not fill this gap on India's behalf. The honest answer is that India must mobilise most of it from within.

India is not starting from zero. By the end of 2024, India had issued \$55.9 billion in green, social, sustainability, and sustainability-linked debt – a 186% rise since 2021. Green debt leads, making up 83% of the total, with most funds directed to clean energy and transport. Sovereign green bonds worth ₹477 billion have helped set benchmarks and boost investor confidence. This is genuinely impressive.

The instruments exist. The challenge is deploying them at scale. India already has green bonds, sovereign green bonds, sustainability-linked bonds, blended finance structures, transition finance instruments and infrastructure investment trusts. What is missing is the connective tissue: a taxonomy, a guarantee architecture, a liquidity mechanism, and the regulatory incentives that make green finance cheaper than brown finance.

The most significant shift in India's



**Balakrishna Pisupati**

Head of the United Nations Environment Programme (UNEP) office in India

India's bottleneck is not funding, but the institutional architecture needed to move it where it is needed

climate-finance landscape in 2025 did not occur at a climate conference but in Mint Street. In 2025, the RBI's Climate Finance and Management of Climate Change Risks Directions for Commercial Banks and Small Finance Banks established a comprehensive framework requiring banks to integrate climate risks into their lending and risk-management practices. Importantly, eligible green activities can qualify as priority sector lending (PSL), while investments in sovereign green bonds are also recognised under the framework.

This is a bigger deal than it looks. PSL requirements are one of the most powerful levers that the RBI holds over bank behaviour. Currently, for every ₹10,000 crore in loans, banks must ensure ₹4,000 crore of PSL.

The RBI can and must go further. It has proposed accepting sovereign green bonds as collateral with more flexibility in margin requirements and adjusting reserve requirements to support credit flows to green sectors. The next frontier is differentiated capital requirements based on climate risk – essentially, making brown lending more capital-intensive and green lending less so.

The RBI's Climate Risk Information System on climate-related financial risks for commercial banks, and its inclusion of sustainable finance in its regulatory sandbox, are steps in the right direction.

The next critical step is a comprehensive climate stress-testing framework for Indian banks – one that assesses the flood risk of a loan portfolio in Bihar as rigorously as it evaluates credit risk.

### The taxonomy unlocks everything else

Finance Minister Nirmala Sitharaman announced in the Union Budget 2024-25 that India would develop a climate-finance taxonomy. This is the foundation of the entire ecosystem. Without a clear legal definition of what counts as "green", green bonds cannot be credibly verified, PSL classifications remain questionable, international investors cannot make compliance claims, and regulators cannot effectively curb greenwashing.

The Ministry of Finance's Climate Finance Taxonomy and the Ministry of Steel's Green Steel Taxonomy will facilitate standardised sustainable investments and boost investor confidence.

The international climate finance system has one instrument that India has chronically underused: blended finance – the strategic use of public or concessional funds to de-risk private investment. Financial instruments such as green bonds, climate funds, and blended finance models are important in mobilising capital for sustainability initiatives, and unlocking

investment at scale will help drive long-term resilience in India's most climate-sensitive sectors.

Here is the arithmetic that makes blended finance so compelling. A first loss guarantee of \$100 million from a public source can unlock \$500 million to \$1 billion in private co-investment in solar, offshore wind, green hydrogen, or climate-resilient agriculture, because it absorbs the risk that private capital finds unacceptable. It needs a capitalisation injection and an expanded mandate to get there.



### Where the finance gap is most acute

One dimension of India's climate finance challenge that receives almost no attention is its federally disaggregated nature. Climate adaptation – the kind of finance that protects coastal villages in Odisha, drought-proofing in Vidarbha, or spring rejuvenation in the Himalayas – is delivered at the State level. But States have neither the borrowing capacity nor the institutional infrastructure to access international climate finance. Tamil Nadu and Kerala have shown that ambitious State-level climate programming is possible. The financing architecture needs to catch up with the ambition.

There are four things that India must do now. First, finalise and enact the Climate Finance Taxonomy without further delay. It is the single most leveraged action available.

Second, the RBI must move from enabling green finance to mandating it – through differentiated capital requirements, mandatory climate stress testing for banks, and expanded PSL targets that include climate adaptation alongside mitigation.

Third, establish a State Climate Finance Facility, capitalised for example, by the Union, National Bank for Agriculture and Rural Development (NABARD), and international sources, to give States and municipalities genuine access to green debt markets.

Fourth, scale sovereign green bond issuances rapidly and embed them in the SLR framework to deepen the domestic market and attract foreign capital.

India's climate-finance challenge is large and urgent, but not insurmountable. The instruments exist, the regulatory framework is taking shape, and capital is available. What is missing is not money, but the institutional capacity to deploy it at scale. Fixing that is the work of the Budget cycles. The country that solves this challenge fastest will shape the future of climate finance in the developing world.

The views expressed are personal

### GS Paper III: Environment

**UPSC Mains Exam Practice Questions:** Examine the role of domestic financial institutions and regulatory reforms in achieving India's Net-Zero target by 2070. (15 Marks, 250 Words)

## Context:

The most formidable challenge before India in its fight against climate change is the mobilization of adequate financial resources. According to Balakrishna Pisupati, Head of the United Nations Environment Programme (UNEP) India Office, India requires ₹162.5 trillion (approximately \$2.5 trillion) to fulfill its Nationally Determined Contributions (NDCs) by 2030. Furthermore, the estimated cost to achieve the 'Net-Zero' emissions target by 2070 stands at a staggering \$10.1 trillion, which is nearly three times India's current GDP. Given that substantial financial aid from the international community remains a distant reality, India must leverage its mainstream financial ecosystem to mobilize capital domestically.

## Key Points

### 1. The Colossal Financing Gap

- **Decarbonization of Core Sectors:** Turning the four critical sectors that account for over half of India's total carbon emissions—steel, cement, electricity, and road transport—green demands an additional capital expenditure (CapEx) of \$467 billion between 2022 and 2030 (approximately \$54 billion annually, or 1.3% of GDP).
- **Failure of International Commitments:** Developed countries backtracked on their Paris Agreement promise to provide \$100 billion annually. Under the 'New Collective Quantified Goal' (NCQG) finalized at the Baku Climate Conference, a commitment of \$300 billion annually by 2035 was established, a figure that India has formally rejected as grossly inadequate.
- **RBI's Estimates:** According to the Reserve Bank of India's 'Report on Currency and Finance', India requires an incremental investment of at least 2.5% of its GDP annually until 2030 to fulfill its green financing mandates.

### 2. India's Current Progress and Financial Instruments

India is not starting from scratch on this front; the nation has made commendable strides in the green debt market:

- **Sustainability Loans and Bonds:** By the end of 2024, India cumulative issuance of green, social, and sustainability-linked debt reached \$55.9 billion (a 186% increase since 2021). Within this, green debt commands an 83% share, primarily deployed in clean energy and sustainable transit.
- **Sovereign Green Bonds:** Issuances worth ₹477 billion of Sovereign Green Bonds have significantly enhanced investor confidence in the market. While instruments like Infrastructure Investment Trusts

(InvITs) and blended finance exist, their deployment at scale is constrained by a lack of robust regulatory incentives.

### 3. RBI's Policy Reforms in the Banking Sector

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The directives issued by the Reserve Bank of India (RBI) have structural implications for India's climate-finance paradigm:

- **Integration of Climate Risk:** It has been made mandatory for commercial and small finance banks to systematically embed climate-related financial risks into their lending frameworks and risk-management architectures.
- **Priority Sector Lending (PSL):** Eligible green activities have now been brought under the ambit of Priority Sector Lending (PSL), legally compelling banks to channel credit to green sectors.
- **Climate Stress-Testing:** The RBI is actively formulating a comprehensive climate stress-testing framework. This will assess how localized vulnerabilities, such as flood risks in Bihar or drought stresses in other states, translate into credit risks across banking loan portfolios.

#### 4. Significance of the 'Climate Finance Taxonomy'

The 'Climate Finance Taxonomy' announced in the Union Budget 2024-25 serves as the foundational bedrock of this entire ecosystem:

- **Curbing Greenwashing:** In the absence of a legally defined classification of what constitutes a "green or eco-friendly" activity, green bonds cannot be authenticated, nor can banks effectively prevent 'greenwashing' (making false claims about environmental sustainability). Taxonomies from the Ministry of Steel (Green Steel Taxonomy) and the Ministry of Finance will standardize sustainable investments.

#### 5. Blended Finance and the Fiscal Constraints of States

- **Leveraging Capital:** Under blended finance frameworks, public funds are strategically deployed to de-risk private investments. For instance, a \$100 million public 'First Loss Guarantee' fund can successfully unlock and attract \$500 million to \$1 billion in private co-investments.
- **Fiscal Limitations of States:** Ground-level climate adaptation measures—such as protecting coastal villages in Odisha or scaling drought-proofing interventions in Vidarbha—are executed by state governments. However, Indian states lack the independent borrowing capacity and institutional frameworks required to access international climate finance directly.

#### Way Forward / Four-Pronged Strategic Measures

To maximize its financial potential, India must proactively implement the following four steps:

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## Daily News Analysis

- **Immediate Enforcement of the Taxonomy:** The 'Climate Finance Taxonomy' must be finalized and legally enacted without delay to provide absolute regulatory clarity to global investors.
- **Mandatory Regulations by the RBI:** The RBI should move beyond merely enabling policy frameworks and mandate differentiated capital requirements. This would make 'brown lending' (loans to polluting industries) costlier while lowering the cost of capital for 'green lending'.
- **Establishment of a State Climate Finance Facility (SCFF):** A dedicated financial facility should be set up in collaboration with the Central Government, NABARD, and international multilateral agencies to grant states and municipal corporations direct access to green debt markets.
- **Expanding Sovereign Green Bonds:** The scope of Sovereign Green Bonds must be scaled rapidly, and banks should be allowed to integrate them into the Statutory Liquidity Ratio (SLR) framework to deepen the domestic market and pull in foreign capital.

### Conclusion

India's climate-finance challenge is massive and deeply urgent, but it is far from insurmountable. While the country has successfully engineered the necessary financial instruments and regulatory backbones (spearheaded by the RBI), the core bottleneck is not a global scarcity of capital, but rather the 'institutional capacity' to deploy it strategically at scale. These institutional gaps must be actively mended through targeted budget cycles. The nation that successfully cracks this code of financial engineering and capacity-building first will ultimately lead the climate financing architecture for the entire developing world.

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