

SYLLABUS: ECOLOGY
Waves of Environmentalism in India

Ramachandra Guha recently discussed the three waves of Indian environmentalism at NCBS, Bengaluru, tracing its origins from colonial industrialization to modern climate activism.

About Environmentalism:

Environmentalism is a socio-political movement that promotes harmonious coexistence between humans and nature. It arose as a response to unchecked industrialization, focusing on ecological balance, sustainability, and justice.

Features of environmentalism are:

1. **Conservation of ecosystems and biodiversity:** It aims to protect natural habitats and species diversity to maintain ecological balance.

E.g. Movements like Chipko in India promoted forest protection and biodiversity conservation.

1. **Sustainability in resource use:** Environmentalism advocates using resources in a way that meets present needs without compromising future generations.

E.g. Promoting renewable energy and organic farming as alternatives to fossil fuels and chemical agriculture.

1. **Social equity (linking ecology with livelihoods):** It links environmental protection with the rights and welfare of marginalized communities.

E.g. Tribal rights over forests under FRA 2006 ensure both conservation and livelihood protection.

1. **Policy interventions to curb pollution/degradation:** The movement pushes for legal frameworks and regulations to reduce environmental damage.

E.g. The Environment Protection Act, 1986 in India empowers the government to address industrial pollution.

About Three Waves of Environmentalism in India:

1. **First Wave (Early 20th Century: Pre-Independence)**
 - **Intellectual critique of colonial industrialization:** Thinkers criticized exploitative British policies that harmed forests and rivers.
 - **Alternative models like organic farming (Albert Howard) and Gandhian sustainability:** Howard promoted natural farming methods, while Gandhi stressed self-sufficiency and minimalism.
 - **Focus on tropical ecology's fragility (J.C. Kumarappa's theories):** Kumarappa advocated for economic systems respecting India's sensitive ecosystems.
 - **Urban planning (Patrick Geddes' sustainable city designs):** Geddes promoted ecological urban designs integrating nature and human settlements.
 - **Examples:**
 - **Tagore's Sriniketan** experiments blending education and ecology.
 - **Organic farming** advocacy by the Howards.

2. **Second Wave (1970s–1980s: Grassroots Movements)**
 - **Mass participation (e.g., Chipko's tree-hugging protests):** Common people, especially women, led non-violent actions to protect forests.
 - **Gandhian non-violence + ecological justice:** Movements merged peaceful protest with demands for environmental equity.
 - **Policy impact: Creation of MoEFCC (1980) and environmental laws:** These movements led to institutional responses like forest protection laws.
 - **Livelihood-centric (e.g., Narmada Bachao Andolan):** Focus shifted to how big projects affected poor communities' lives and ecology.
 - **Examples:**
 - **Chipko Movement (1973):** Saved Himalayan forests; inspired global eco-activism.

- **Silent Valley Movement (1978):** Halted hydroelectric project in Kerala.
- 3. **Third Wave (21st Century: Climate-Centric Youth Activism)**
 - **Climate change as a unifying theme:** Youth movements now focus on global warming and ecological breakdown.
 - **Urban-centric issues: Air pollution, e-waste:** Cities face new threats like hazardous air and unregulated electronic waste.
 - **Digital mobilization (Fridays for Future India):** social media enables fast, wide-reaching environmental campaigns.
 - **Demand for green jobs and renewable energy:** Youth seek sustainable livelihoods through clean energy and eco-tech.
 - **Examples:**
 - Protests against **Aarey Colony** deforestation(Mumbai Metro).
 - **Chennai water crisis (2019)** sparking urban sustainability debates.

Significance of Environmentalism in India:

- **Policy Reforms:** Environmentalism has driven legal and institutional changes to protect nature and regulate industry.
- **Global Leadership:** India showcases leadership in clean energy and climate diplomacy on global platforms.
- **Livelihood Protection:** Environmental conservation safeguards the sustenance of forest-dependent communities.
- **Climate Resilience:** Environmentalism promotes ecosystem-based solutions to reduce disaster vulnerability.

UPSC SYLLABUS TOPIC: GS PAPER2-POLITY- ISSUES AND CHALLENGES PERTAINING TO THE FEDERAL STRUCTURE.

Lok Sabha seat readjustment needs fair approach

A national debate is ongoing about the readjustment of Lok Sabha seats after the upcoming Census. However, this issue is often mistakenly called delimitation. While delimitation redraws constituency boundaries, seat readjustment—mandated by Article 82—is meant to reflect population changes. The freeze on seat numbers since 1971 has led to major imbalances.

Historical Background and Constitutional Basis for Seat Allocation

1. The current strength of the Lok Sabha (543 seats) was fixed using the 1971 Census when India's population was around 54.79 crore.
2. Despite the population increasing to an estimated 141 crore by 2025, the number of seats has remained frozen due to a constitutional amendment extending this freeze until 2026.
3. Article 81 mandates that the ratio of seats to population should be the same across States, and Article 82 requires readjustment after each Census.

Population Disparities and Regional Concerns

1. States like Uttar Pradesh and Bihar witnessed a disproportionate rise in population due to the poor implementation of family planning.
2. For instance, Uttar Pradesh's population grew from 8.38 crore (1971) to 24.1 crore (2025), and Bihar from 4.21 crore to 13.1 crore. In contrast, southern States, particularly Kerala, successfully controlled population growth—Kerala's population increased by only 68% in 50 years.
3. If readjustment follows Article 81 strictly, northern States would gain many more seats. Uttar Pradesh could rise from 80 to 240 seats, while Kerala would only go from 20 to 36. This raises concerns in southern States about political marginalization, as they could lose relative representation despite better governance.

Equity-Based Readjustment Approach

1. A fair method is to apply a **uniform 68% increase in seats**, based on Kerala's population growth.
2. This would give **UP 134 seats, Kerala 34, and Tamil Nadu 66**, maintaining inter-State balance.
3. Total Lok Sabha strength would rise to **912**.
4. Although this **violates Article 81(2)(a)**, the article argues that this rule is now outdated and unfair.

Alternative Formulae for Seat Allocation

Several formulae are proposed to ensure equity:

1. **15 lakh per seat model:** UP gets 160 seats; Kerala will get only a few seats more than 20. This increases the gap between northern and southern States.
2. **Historical average-based model:** In 1952, each constituency had 7.6 lakh people; in 1971, it became 10 lakh. Using the new Parliament's capacity (800 seats), each seat could represent about 18 lakh people. Under this, UP gets 134 seats, Kerala 34, Tamil Nadu 66.

PRELIM FACTS

1. India Skills Accelerator Initiative

The Ministry of Skill Development and Entrepreneurship (MSDE) has partnered with the World Economic Forum (WEF) to launch the India Skills Accelerator.

About India Skills Accelerator Initiative:

- **What is India Skills Accelerator?**
 - A **national-level public-private platform** focused on **future-ready skilling** and inclusive workforce development.
 - Aims to be a **systemic change enabler** by improving coordination among stakeholders, updating policy frameworks, and creating scalable skilling pathways.
- The Accelerator aims to **catalyze change** across **three critical levels:**
- By improving awareness and shifting mindsets around future skills needs,
- Increasing collaboration and knowledge sharing among stakeholders, and
- Committing to upgrade institutional structures and policy frameworks to support a more adaptive and responsive skilling ecosystem.
- **Organizations Involved:** Ministry of Skill Development & Entrepreneurship (MSDE) and World Economic Forum (WEF).
- **Core Objectives:**
 - Raise awareness of emerging skill demands.
 - Foster public-private synergy and knowledge sharing.
 - Update policies and structures to be agile and responsive.
 - Align training with sectors like AI, robotics, advanced manufacturing, energy, and GCCs.
- **Key Features:**
 - **Sectoral Priority Mapping:** Focus on high-growth sectors and formalizing informal jobs.
 - **Lifelong Learning Focus:** Mobilize investment in upskilling & reskilling across life stages.
 - **Data-led Governance:** Use surveys and WEF's Global Learning Network for peer benchmarking.
 - **10–12 High-impact Priorities:** Develop thematic working groups for measurable results.
 - **Global Linkages:** Align with insights from WEF's *Future of Jobs 2025* report.

2. 3D Printing

Japan's West Japan Railway Company unveiled the world's first 3D-printed train station in Arida city. The new Hatsushima station was built in under six hours, showcasing cutting-edge construction innovation.

About 3D Printing:

- **What is 3D Printing?**
 - **3D Printing** or *Additive Manufacturing* is a technique of creating three-dimensional objects by layering materials based on a **digital model**.
 - Unlike traditional manufacturing (subtractive), it **adds material layer by layer**, reducing waste and allowing intricate designs.

How 3D Printing Works?

- **Design:** The process begins with a 3D digital model created using CAD software, saved in formats like .STL or .OBJ.
- **Slicing:** Slicing software divides the digital model into hundreds or thousands of horizontal layers.
- **Printing:** The 3D printer deposits material layer by layer, following the sliced instructions. Each layer solidifies quickly, gradually forming the final object.
- **Post-Processing:** Once printing is complete, the object undergoes finishing like curing, sanding, or painting.
- **Types of 3D Printing Technologies:**
 - **Fused Deposition Modelling (FDM):** This method extrudes melted thermoplastic filaments layer by layer to build the object.
 - **Selective Laser Sintering (SLS):** Uses lasers to fuse powdered materials (plastics, metals) into solid structures.
 - **Direct Metal Laser Sintering (DMLS):** A laser fuses metal powders layer-by-layer to create durable metal parts. DMLS is extensively used in aerospace and medical industries.
 - **Material Jetting:** Photopolymer droplets are jetted onto a surface and cured using UV light. It allows high accuracy and is useful for colorful and detailed prototypes.
- **Limitations of 3D Printing:**
 - **Material Limitations:** Only select plastics, metals, or composites work with specific printers. This restricts its use across many conventional manufacturing areas.
 - **Size Constraints:** Printers have limited build volumes; large items need to be printed in parts. These parts then require assembly, which increases complexity.
 - **Structural Weakness:** Layer-by-layer bonding may lead to delamination or weak joints under stress. This limits usage for heavy-duty or high-pressure applications.
 - **Intellectual Property Issues:** Easily shareable digital designs increase the risk of counterfeit products.

3. Niveshak Didi Initiative

The Investor Education and Protection Fund Authority (IEPFA) and India Post Payments Bank (IPPB) have signed a Memorandum of Agreement to launch Phase 2 of the *Niveshak Didi* initiative to deepen rural financial literacy for women across India.

About Niveshak Didi initiative:

- **What it is?**
 - Niveshak Didi is a women-led financial literacy initiative focused on empowering rural populations through community-based financial education.
- **Launched in:** Initially launched in **2023**, currently entering **Phase 2 in April 2025**.
- **Organisations Involved:**

- **Investor Education and Protection Fund Authority (IEPFA)** – under the Ministry of Corporate Affairs.
- **India Post Payments Bank (IPPB)** – under the Department of Posts, Ministry of Communications.
- **Objective:**
 - To build **financial awareness and responsible money management habits** among rural women through community-driven models.
 - Promote inclusive banking, digital literacy, and fraud prevention using local women influencers.
- **Key Features:**
 - **Grassroots Deployment:** Over **40,000 women postal workers** to be trained as Niveshak Didis for outreach across underserved regions.
 - **Financial Literacy Camps:** Phase 2 will include **4,000+ new camps** targeting rural, semi-urban, and tribal areas.
 - **Focused Curriculum:** Covers savings, **digital banking, safe investment**, and fraud prevention.
 - **Women-Centric Model:** Over **60% beneficiaries in Phase 1** were women from remote areas; the model capitalizes on their role as community influencers.
 - **Digital Inclusion:** Emphasizes the use of IPPB's paperless and cashless banking tools through vernacular mediums in **13 Indian languages**.

4. One State, One RRB Policy

The Ministry of Finance has notified the amalgamation of 26 Regional Rural Banks (RRBs) across 10 states and 1 union territory under the “One State, One RRB” policy, effective from May 1, 2025, reducing the **total number of RRBs to 28**.

About One State, One RRB Policy:

- **What it is:** A reform initiative of the Department of Financial Services aimed at consolidating RRBs within a state into a single entity.
 - The consolidation process thus was initiated in the **year 2005** as an off-shoot of **Dr Vyas Committee Recommendations**.
- **Objective:**
 - Enhance operational efficiency and governance.
 - Rationalize costs and optimize human and technological resources.
 - Eliminate competition among sponsor banks within a state.
- **Benefits of Consolidation under One State, One RRB:**
- **Larger operational areas** allow improved scale and outreach.
- **Technology integration and standardization** of banking services.
- **Enhanced credit exposure and risk management.**
- **Unified governance** under one sponsor bank per state.

About Regional Rural Banks (RRBs):

- **Established:** In **1975** under the **Regional Rural Banks Act, 1976**.
- **Recommendation:** Based on **Narasimham Committee Report (1975)**.
- **Purpose:** To bridge rural credit gaps and strengthen institutional lending in rural India.
- **Regulated by:** Reserve Bank of India (RBI)
- **Supervised by:** National Bank for Agriculture and Rural Development (NABARD)
- **Ownership Structure:**
 - Government of India – **50%**
 - State Government – **15%**
 - Sponsor Bank – **35%**
- **Objectives of Regional Rural Banks (RRBs):**

- **Rural Development:** Promote credit access in rural areas for agriculture, trade, and services.
- **Financial Inclusion:** Provide banking services to small and marginal farmers, artisans, labourers, and small entrepreneurs.
- **Priority Sector Lending:** Focus on priority sectors such as agriculture and MSMEs.
- **Institutional Credit Channel:** Act as a supplement to cooperative credit structure in rural India.

ANSWER WRITING

Q. “Demographic dividend can turn into a demographic disaster without adequate employment opportunities.” Analyze this statement in the context of India’s workforce readiness. (10 Marks, 150 Words)

Demographic dividend refers to the economic growth potential that arises from a shift in a country’s age structure, typically when the working-age population (15–64 years) is larger than the non-working-age. As per **UNFPA 2023**, over **68% of India’s population** falls in this category. Yet, without **adequate employment** and **skill development**, this advantage can devolve into a **demographic disaster**.

Demographic dividend can turn into demographic disaster without adequate employment in the context of India’s workforce readiness

- **Lack of job-ready skills:** A youthful population without the **skills demanded by modern industries** leads to rising unemployment, underemployment, and economic discontent.
- **Rise in social unrest:** Frustrated youth with degrees but **no employment opportunities** can fuel social instability, affecting national progress and cohesion.
For example: In 2023, **large-scale protests** erupted in Bihar and UP against changes in the railway recruitment process, highlighting job-related grievances among educated youth.
- **Underutilisation of potential:** If the majority of the young population remains **unengaged in productive work**, it leads to a **waste of demographic advantage** and slows economic growth.
For example: Only 3.84% of Indian engineers are employable in software-related jobs at start-ups, as per the Aspiring Minds Employability Report.
- **Increased dependency ratio:** A young but unemployed population increases the **economic burden** on the employed, straining public welfare and reducing household savings.
- **Brain drain escalation:** Skilled individuals, facing **limited domestic opportunities**, migrate abroad, causing a **loss of talent** and weakening India’s innovation capacity.

Way Ahead: Measures to transform demographic dividend into opportunity

- **Curriculum-industry sync:** Aligning **academic curriculum with industry needs** ensures students gain market-relevant skills and boosts their employability.
- **Promote experiential learning:** Embedding **problem-solving and real-world projects** into education fosters critical thinking and prepares students for dynamic job roles.
- **Strengthen vocational training:** Expanding **skill development programmes** for non-academic youth can reduce unemployment and ensure inclusive workforce participation.
For example: The **PMKVY (Pradhan Mantri Kaushal Vikas Yojana)** trained over 1.3 crore youth across sectors like construction, retail, and IT till 2023.
- **Enhance digital infrastructure:** Building **online education and job access in rural areas** can bridge the urban-rural employment divide.
For example: Under **BharatNet**, high-speed internet connectivity reached **2.14 lakh Gram Panchayats**, enabling rural students to access digital skill platforms like SWAYAM.
- **Boost R&D investment:** Increasing **funds for research and innovation** will foster high-tech job creation and sustain long-term economic growth.
For example: The National Research Foundation (NRF), with a planned outlay of **₹50,000 crore**, aims to promote research in AI, climate, and advanced tech.

India stands at a demographic crossroads, a young population brimming with potential, yet hindered by skilling gaps, jobless growth, and a shrinking formal sector. To avert a demographic disaster, India must invest in industry-aligned education, upskilling, and entrepreneurship ecosystems that convert its vast human capital into productive economic assets.

MCQ

1. Consider the following statements about IUCN extinction categories:
 1. "Extinct" species may still persist in extremely low numbers in inaccessible wild habitats.
 2. "Least Concern" species have shown signs of population stress but are protected by law.
 3. "Not Evaluated" refers to species that have not yet been formally assessed under IUCN criteria.
 How many of the above statements is/are correct?
 - (a) Only one**
 - (b) Only two
 - (c) All three
 - (d) None

2. Consider the following statements regarding Ottawa Convention.

Statement-I: India is not a party to the Ottawa Convention.

Statement-II: India supports the treaty's humanitarian goals but maintains the right to use landmines for defensive purposes.

 Which one of the following is correct in respect of the above statements?
 - a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I**
 - b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
 - c) Statement-I is correct but Statement-II is incorrect
 - d) Statement-I is incorrect but Statement-II is correct

3. Consider the following statements regarding the Indian Tiger and its conservation:
 1. It is the National Animal of India.
 2. It is listed in Appendix I of CITES.
 3. Maximum tiger population in India is currently found in Madhya Pradesh.
 4. The Global Tiger Initiative is a UNDP-led effort for transboundary tiger conservation.
 Which of the above statements are correct?
 - a) 1, 3, and 4 only
 - b) 2, 3, and 4 only
 - c) 1, 2, and 4 only
 - d) 1, 2, and 3 only**

4. Consider the following statements regarding tariffs and their implications:
 1. Tariffs are imposed only at the consumer level and never affect businesses directly.
 2. Anti-dumping tariffs are used to protect domestic industries from unfair pricing practices.
 3. Specific tariffs are charged per unit of a good, regardless of its price.
 Which of the above statements are correct?
 - a) 2 only
 - b) 2 and 3 only**
 - c) 1 and 2 only
 - d) 1, 2, and 3

5. The recent discovery of Rare Earth Elements (REEs) in the Karaganda Region is strategically significant primarily because:
 - a) The region borders the Caspian Sea, facilitating REE exports via sea routes
 - b) It enhances Kazakhstan's role in supplying critical minerals for green technologies**
 - c) It lies along the ancient Silk Road, enabling cultural exchanges of technology
 - d) It hosts the Baikonur Cosmodrome, integrating REE use in aerospace industries

6. Which of the following best reflects the key innovation introduced under the Bustard Recovery Program for the Great Indian Bustard?
 - a) Introduction of microchip tracking for urban-nesting bustards
 - b) Establishment of exclusive marine protected areas for transboundary migration

- c) Translocation of breeding adults into dense forest corridors to protect from predators
- d) Pilot implementation of “surgical habitat management” to modify grassland ecosystems**
7. Consider the following statements regarding India Skills Accelerator Initiative
1. The Ministry of Skill Development and Entrepreneurship (MSDE) has partnered with the World Economic Forum (WEF) to launch the India Skills Accelerator.
 2. A national-level public-private platform focused on future-ready skilling and inclusive workforce development.
- Which of the above statements is/are correct?
- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2
8. Consider the following statements regarding 3D Printing
1. 3D Printing or Additive Manufacturing is a technique of creating two-dimensional objects by layering materials based on a digital model.
 2. Unlike traditional manufacturing (subtractive), it adds material layer by layer, reducing waste and allowing intricate designs.
- Which of the above statements is/are correct?
- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2
9. Consider the following statements regarding Niveshak Didi initiative:
1. Niveshak Didi is a women-led financial literacy initiative focused on empowering rural populations through community-based financial education.
 2. It was initially launched in 2022, currently entering Phase 2 in April 2025.
- Which of the above statements is/are correct?
- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2
10. Consider the following statements regarding One State, One RRB Policy:
1. A reform initiative of the Department of Financial Services aimed at consolidating RRBs within a state into a single entity.
 2. The consolidation process thus was initiated in the year 2003 as an off-shoot of Dr Vyas Committee Recommendations
- Which of the above statements is/are correct?
- (a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2