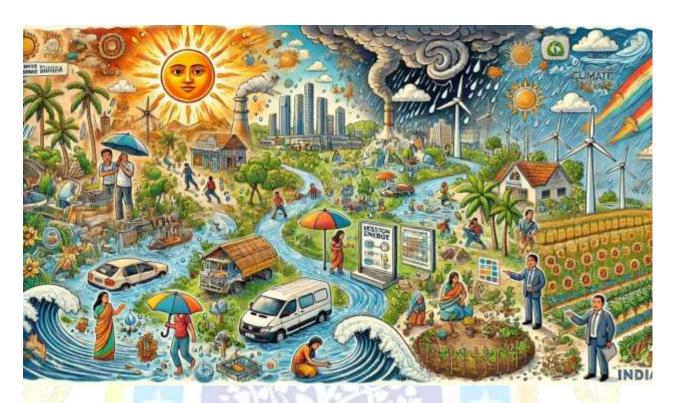# CLIMATE CHANGE DISASTER IN INDIA: STATUS, MEASURES, AND THE WAY FORWARD: ENVIRONMENT: GS - III

India, a nation with a rich tapestry of climatic zones and ecosystems, is increasingly grappling with the devastating effects of climate change. The year 2024 stands as a stark reminder, with record-breaking heat waves, erratic monsoons, severe flooding, and a surge in tropical cyclones underscoring the urgency for action.

Status of Climate Change Disasters in India

Rising Temperatures and Heatwaves

The India Meteorological Department (IMD) declared 2024 as the hottest year on record since 1901. Heatwaves swept across the nation, affecting 23 states and causing over 44,000 heatstroke cases and 300 heat-related deaths. The Indian capital experienced temperatures nearing 50°C, leading to a 16% increase in peak power demand compared to the previous year.

Erratic Monsoons and Declining Rainfall

Monsoon patterns, a lifeline for Indian agriculture, are becoming increasingly erratic. Between 2012 and 2022, southwest monsoon rainfall declined by up to 20% in key agricultural regions like the Indo-Gangetic plains. Such inconsistencies exacerbate crop losses, which currently account for 0.25% of India's GDP annually.

Cyclones and Flooding

India has witnessed a 52% increase in tropical cyclones in the Arabian Sea over the last two decades due to rising sea surface temperatures. Cyclones and subsequent flooding in 2024 affected states like Telangana, Andhra Pradesh, Tamil Nadu, and Himachal Pradesh. Unfortunately, while India's cyclone early warning system covers 100% of the cyclone-prone population, only one-third of flood-prone regions benefit from similar preparedness.

Impact on Agriculture and Livelihoods

Nearly half of India's agriculture is rainfed, making it highly susceptible to changing rainfall patterns. Heat stress has also reduced milk productivity in the dairy sector by up to 20%, posing a significant challenge for an industry that contributes 5% to India's GDP.

Government Measures to Address Climate Change Disasters

India is actively developing strategies to address climate risks, focusing on both adaptation and mitigation. Here are some notable efforts:

1. **Mission Mausam** This initiative aims to improve urban flood preparedness by collecting granular climate data across cities. The mission will help develop city-level strategies to manage flooding and heavy rainfall events more effectively.
2. **Development of Resilient Crops** The Indian Council on Agricultural Research (ICAR) has developed over 2,500 varieties of flood- and drought-resistant crops to mitigate climate- induced agricultural losses. This is part of an ongoing effort to revamp cropping practices and adapt to changing monsoon patterns.
3. **Strengthening Disaster Management Frameworks** The Disaster Management (Amendment) Bill 2024 empowers states to form Urban Disaster Management Authorities. These bodies will focus on enhancing city-level resilience by ensuring infrastructure and financial support for disaster preparedness.
4. **Early Warning Systems** India's cyclone early warning system provides complete coverage to cyclone-prone populations. However, efforts are needed to extend similar systems to cover flood-prone regions comprehensively.
5. **Emission Mitigation** India is committed to reducing its carbon emissions as part of its obligations under the Paris Agreement. The focus on renewable energy expansion, especially solar and wind, complements adaptation strategies aimed at addressing immediate climate risks.

Disaster Action Plan and Strategy

To tackle the multifaceted challenges of climate change, India must adopt a holistic approach that integrates risk assessment, adaptation measures, and financial planning. Below are key strategies:

1. Comprehensive Risk Assessment

Understanding the diverse impacts of climate change across regions and sectors is crucial. For example:

- Heat stress disproportionately affects vulnerable populations, such as senior citizens, children, and those with chronic health conditions.
- Detailed risk mapping can help prioritize targeted actions in high-risk areas like Odisha and Telangana, which face overlapping risks of floods, droughts, and cyclones.

2. Revamping Agriculture

Agriculture is at the frontline of India's climate crisis. Key steps include:

- Revising crop weather calendars to align with new rainfall patterns.
- Promoting resilient crop varieties and localized farming practices to reduce climate-induced losses.
- Introducing low-cost, decentralized renewable energy solutions, such as solar-powered chillers, to combat heat stress in the dairy and livestock sectors.

3. Urban Climate Resilience

Cities must prepare for the increasing frequency of extreme weather events. Steps include:

- Implementing robust flood warning systems to cover all flood-prone populations.
- Encouraging the use of green municipal bonds and city resilience bonds to finance urban adaptation projects.
- Strengthening waste and water management systems to reduce vulnerability to floods.

4. Disaster Risk Financing

- Financial resilience is vital for effective disaster management. India must:

- Expand insurance coverage for vulnerable communities and sectors.

Develop public-private partnerships to mobilize funding for climate adaptation projects.

- Prioritize investments in resilient infrastructure, particularly in urban areas prone to flooding and heat stress.

5. Leveraging Technology and Data

Advanced technologies, such as satellite monitoring and artificial intelligence, can improve early warning systems and disaster response. Mission Mausam's granular-scale data collection is a step in the right direction, but it must be scaled nationwide.

Way Forward

The urgency of climate action cannot be overstated. As India prepares its national adaptation plan, the following priorities should guide the way forward:

1. **Integrate Climate Resilience into Financial Planning** Climate resilience must move from the margins to the mainstream of India's financial and policy frameworks. The upcoming 2025 Budget presents an opportunity to allocate resources for climate adaptation across sectors.
2. **Promote Collaborative Governance** Climate adaptation requires collaboration across government agencies, industries, and civil society. India should establish platforms for stakeholders to co-create solutions tailored to local needs.
3. **Scale Up Public Awareness** Public engagement is critical to building a culture of climate resilience. Education campaigns can empower communities to adopt sustainable practices and participate in disaster preparedness efforts.
4. **Enhance Global Partnerships** India can benefit from international expertise and funding by participating in global climate initiatives. Collaborative efforts can accelerate the development of advanced technologies and infrastructure.

Conclusion

India stands at a critical juncture in its fight against climate change. The challenges are immense, but so are the opportunities to innovate and lead by example. By prioritizing adaptation alongside mitigation, revamping agricultural practices, strengthening disaster management frameworks, and leveraging financial and technological resources, India can build a climate-resilient future.

The road ahead is complex, but with determination and collaboration, India can turn the tide against climate change and safeguard its people, economy, and environment for generations to come.

Main Practice Question

The Supreme Court of India has emphasized transparency and inclusivity in appointments to public offices. Discuss how these principles can be applied to the selection of Vice-Chancellors in Indian universities. (250 words

Answer Guidelines

1. **Introduction (30-40 words):**
   - ➤ Briefly mention the Supreme Court's emphasis on transparency and inclusivity in appointments, referencing key judgments or principles.

➢ State the relevance of these principles in the context of university leadership.

2. **Body (160-180 words):**
   ➢ **Current Issues:**
     ▪ Highlight ambiguities in the existing selection process for Vice-Chancellors.
     ▪ Discuss challenges like political influence, lack of representation, and non-inclusive mechanisms.

   ➢ **Application of Transparency:**
     ▪ Stress the need for clear criteria for selection, such as merit, academic excellence, and leadership qualities.
     ▪ Propose mechanisms like publicized selection criteria, third-party audits, and accountability measures.

   ➢ **Application of Inclusivity:**
     ▪ Suggest involving stakeholders such as faculty, students, and independent experts in the selection process.
     ▪ Highlight global best practices, such as the inclusion of diverse committees in the US and UK.

   ➢ **Benefits:**
     ▪ Improved trust in institutions, better leadership, and enhanced academic and administrative efficiency.

3. **Conclusion (30-40 words):**
   ➢ Reiterate the importance of adopting transparent and inclusive practices in selecting Vice-Chancellors to strengthen India's higher education system in alignment with constitutional and global standards.

MIND MAP:

Climate Change in India

Status of Disasters
- Rising Temperatures
  - Record-breaking heatwaves in 2024
  - Over 44,000 heatstroke cases
  - 300 deaths due to heat
- Erratic Monsoons
  - Declining rainfall (20% reduction in key areas)
  - Impact on agriculture
- Cyclones and Flooding
  - 52% increase in Arabian Sea cyclones
  - Floods affecting multiple states
- Impact on Agriculture
  - Rainfed agriculture highly vulnerable
  - Milk productivity down by 20%

Government Measures
- Mission Mausam (urban flood preparedness)
- Resilient Crops (2,500+ drought-resistant varieties)
- Strengthened Disaster Management
- Cyclone Early Warning Systems (100% coverage)
- Emission Mitigation (renewable energy expansion)

Action Plan
- Comprehensive Risk Assessment — Focus on high-risk areas
- Revamping Agriculture — Resilient crops and revised farming practices
- Urban Resilience — Flood warning systems, resilient bonds
- Disaster Risk Financing — Insurance, public-private partnerships
- Leveraging Technology — AI, satellite monitoring

Way Forward
- Integrate climate resilience into budgets
- Collaborative governance and global partnerships
- Public awareness campaigns