



## Making India Disaster Resilient

This editorial is based on “[Cyclone Remal aftermath shows why it’s necessary to build disaster-resilient infrastructure](#)” which was published in The Indian Express on 30/05/2024. The article brings into picture the rise of India’s gaming sector and challenges associated with it.

**For Prelims:** [Natural disasters](#), [Cyclones](#), 2004 Indian Ocean Tsunami, [Cyclone Remal](#), [National Disaster Management Authority](#), [Extreme weather events](#), [Heat waves](#), Disaster Management Act of 2005, [Sendai Framework for Disaster Risk Reduction](#), Hyogo Framework for Action, [Cyclone Biparjoy](#), [2022 Joshimath land subsidence crisis](#).

**For Mains:** Framework Related to Disaster Management in India, Factors are Exacerbating India’s Disaster Risk.

India is a vast country prone to a multitude of [natural disasters](#). From the wrath of [cyclones](#) like [Odisha in 1999](#) to [2004 Indian Ocean Tsunami](#) to the recent landslides triggered by [Cyclone Remal](#) in the Northeast, the country has witnessed the destructive force of nature.

While the establishment of the [National Disaster Management Authority \(NDMA\)](#) marked a positive step. The very nature of disasters has undergone a drastic shift. [Extreme weather events](#), often intensified by climate change, are becoming more frequent and severe. New threats like [heat waves](#) are emerging, and even more concerning is the rise of **multi-hazard disasters**, leading to cascading effects and far greater destruction.

In this critical scenario, reactive measures are no longer enough. India needs a **proactive approach** that prioritizes disaster preparedness.

### What is the Framework Related to Disaster Management in India?

- **Disaster Management Act of 2005:** The [Disaster Management Act of 2005](#) has provided the legal and institutional framework for disaster management in India at national, state and district levels.
  - While the **primary responsibility of disaster management rests with the States**, the Central Government supports the efforts of State Governments by providing logistical and financial support.
- **Institutional Framework under Disaster Management Act of 2005 :**
  - **National Disaster Management Authority (NDMA):** Apex body headed by the **Prime Minister**, responsible for policy, plan, and guideline formulation for disaster management (DM).
    - NDMA addresses both **natural and man-made disasters** and coordinates enforcement and implementation.
  - **National Executive Committee (NEC):** Assists NDMA, chaired by the Union **Home**

**Secretary**, comprising various secretaries and officials.

- Prepares and monitors the National Plan for DM and coordinates responses to disaster situations.
- **State Disaster Management Authority (SDMA)**: Headed by the **Chief Minister**, responsible for state-level DM policies and plans, coordinating implementation, and integrating mitigation measures in state development plans.
- **District Disaster Management Authority (DDMA)**: Led by the **District Collector** with an elected representative as Co-Chairperson.
  - Prepares and implements district-level DM plans and ensures compliance with national and state policies.
- **Local Authorities**: Includes [Panchayati Raj Institutions](#), [Municipalities](#), **District and Cantonment Boards**, and Town Planning Authorities. Responsible for capacity building, relief, rehabilitation, and preparing DM plans.
- **Key Institutions:**
  - **National Institute of Disaster Management (NIDM)**: Focuses on capacity development, training, research, and documentation.
    - Functions under NDMA's guidelines and aims to become a '**Centre of Excellence**' in DM.
  - **National Disaster Response Force (NDRF)**: Specialized response force for natural and man-made disasters, including Chemical, Biological, Radiological, and Nuclear emergencies.
    - Operates under NDMA's direction, with eight battalions positioned across different locations.
- **Committees:**
  - **Cabinet Committee on Management of Natural Calamities (CCMNC)**: Oversees management of natural calamities, suggests preventive measures, and promotes public awareness.
- **International Commitments:**
  - **Sendai Framework for Disaster Risk Reduction (SFDRR)**: India is a signatory to the SFDRR which was adopted during the **Third UN World Conference on Disaster Risk Reduction** in March 2015.
    - India is dedicated to achieving the seven goals set under the framework through systematic and sustainable efforts.
  - **Hyogo Framework for Action (HFA)**: India is a signatory to the HFA, adopted globally to reduce disaster losses in lives and economic and environmental assets.
    - The HFA set three strategic goals and five priority action areas focused on integrating disaster risk reduction into **sustainable development policies**, capacity building, preparedness, and vulnerability reduction.

## What are the Current Major Disaster Threats that India Faces?

- **Floods**: India experiences frequent **floods**, particularly during the monsoon season. Over **40 million hectares (12% of land)** are prone to floods and river erosion. It is getting exacerbated by **Glacial Lake Outburst Floods**.
  - **Examples**: Floods in **Bihar (2023)**, **Assam (2022)**
- **Cyclones and Storms**: India's coastline is susceptible to cyclones originating in the Bay of Bengal and the Arabian Sea. Of the **7,516 km long coastline**, approximately **5,700 km** is vulnerable to cyclones and tsunamis.
  - **Examples**: **Cyclone Biparjoy (2023)** and **Cyclone Fani (2019)**.
- **Earthquakes**: India is located in a seismically active region, with several fault lines running across the country. 58.6% of the landmass is prone to moderate to very high intensity earthquakes.
  - **Examples**: Earthquake in **Mizoram (2022)**, Earthquake in **Sikkim (2011)**
- **Droughts**: Prolonged dry spells and erratic rainfall patterns can lead to severe **droughts**, affecting agriculture and water resources. **68%** of the cultivable area is susceptible to drought.
  - **Examples**: Drought in 66% of **Maharashtra (2024)**.
- **Landslides**: Hilly and mountainous regions in India are prone to **landslides**, especially during heavy rainfall or earthquakes. India is considered among the top five landslide-prone countries globally.
  - **Examples**: Landslides in **Himachal Pradesh (2023)**, Landslides in **Manipur (2022)**.

- **Heat Waves:** Rising temperatures and prolonged periods of high heat can lead to life-threatening heat waves.
  - **Examples:** Heat waves across India (2022, 2023, 2024).
    - The country reported **280 heat wave days** from 11th March- 18th May, 2022.
- **Forest Fires:** Dry conditions and human activities can contribute to [forest fires](#), causing environmental damage and air pollution. Based on the forest inventory records, **54.40% of forests in India** are exposed to occasional fires
  - **Examples:** Forest fires in **Himachal Pradesh (2024)** and Forest fires in **Goa (2023)**.
- **Industrial and Chemical Accidents:** India's growing industrial sector and improper handling of hazardous materials can lead to industrial and chemical accidents.
  - **Examples:** Chemical spill in **Surat (2023)**, Industrial fire in **Mumbai (2024)**.

## What Factors are Exacerbating India's Disaster Risk?

- **Urbanization and Unplanned Development:** Rapid urbanization and unplanned development in cities have increased the vulnerability to disasters like floods and earthquakes.
  - **Example:** The **2023 Chennai floods** were attributed to unchecked development and encroachment on water bodies and wetlands.
- **Rising Climate Change Impact:** Climate change is amplifying the frequency and intensity of extreme weather events like cyclones, floods, and droughts.
  - **Example:** The devastating [Cyclone Amphan in 2020](#) was fueled by warmer ocean temperatures due to climate change.
- **Aging Infrastructure and Lack of Maintenance:** India's aging infrastructure, such as **dams, bridges, and buildings, coupled** with inadequate maintenance, increases the risk of disasters.
  - The **Parliamentary Standing Committee on Water** in 2023 raised concerns over the safety of aging dams that are **more than 100 years old**.
- **Environmental Degradation:** Activities like **deforestation, mining, and unsustainable land-use practices** have increased the risk of landslides and soil erosion.
  - **Example:** The [2022 Joshimath land subsidence crisis](#) in Uttarakhand was attributed to unregulated construction and mining activities.
- **Industrial and Technological Hazards:** India's growing industrialization and reliance on hazardous materials increase the risk of industrial accidents and chemical disasters.
  - **Example:** The gas leak at a chemical plant in **Visakhapatnam (2020)** exposed thousands to toxic fumes.

## What Measures Should India Adopt to Reduce Disaster Risk and Enhance Disaster Preparedness?

- **Establish Dedicated Disaster Response Corridors:** Designate and develop dedicated disaster response corridors, including **road networks, rail links, and air routes**, to ensure uninterrupted access for emergency services and aid during disasters.
  - These corridors could be designed to be resilient to hazards and equipped with necessary infrastructure and resources for efficient disaster response.
- **Promote Disaster-Resilient Infrastructure:** Mandate the adoption of disaster-resilient design and construction principles for all critical infrastructure projects, such as bridges, dams, power plants, and communication networks.
  - Implementing **stricter building codes** that mandate disaster-resistant construction using **earthquake-proof materials, fire-proof materials and wind-resistant designs**.
    - Additionally, offering tax breaks and financial assistance for retrofitting existing structures to improve their resilience.
- **Develop Disaster-Resilient Agricultural Practices:** Promote the adoption of disaster-resilient agricultural practices, such as drought-resistant crops, precision farming, and soil conservation techniques.
  - Learning from successful examples like **Burkina Faso's Zai pit farming technique**, which enhances soil moisture retention and crop yields during droughts.
- **Promote Ecosystem-based Disaster Risk Reduction (Eco-DRR):** Integrate ecosystem-based approaches into disaster risk reduction strategies by conserving, restoring, and sustainably

managing natural ecosystems like **forests, wetlands, and coastal habitats**.

- These ecosystems can act as **natural barriers against hazards like floods, storms, and landslides**, while also providing co-benefits like carbon sequestration and biodiversity conservation.
- **Strengthen Multi-Hazard Early Warning Systems:** Develop robust, integrated early warning systems that can detect and provide timely alerts for multiple hazards, such as cyclones, floods, heatwaves, and landslides.
  - Leveraging advanced technologies like **remote sensing, AI, and big data analytics** to improve hazard monitoring, forecasting, and risk communication.
- **Micronet Grids for Critical Infrastructure:** Establish localized, self-sufficient power grids powered by renewable sources like solar and micro-hydro for critical infrastructure like hospitals and communication systems.
  - This ensures continued functionality even during widespread power outages caused by disasters.
- **Mental Health Response Teams:** Integrating mental health professionals into disaster response efforts to provide **psychological support** to survivors dealing with trauma, anxiety, and displacement. This can significantly improve long-term recovery outcomes.
- **Enhanced Institutional Capacity:** The institutions must hire permanent workforce rather than contractual.
  - A permanent workforce allows for continuous **skill development, knowledge transfer, and institutional memory**.
    - This fosters a more capable disaster management system compared to relying on temporary staff who may lack experience.
  - Moreover, the Local bodies should be allocated a substantial **Disaster Readiness Reserve to complement disaster reactivity to proactive measures**.

#### **Drishti Mains Question:**

Examine the factors contributing to India's increasing vulnerability to disasters. What measures should India adopt to enhance its disaster preparedness??

### **UPSC Civil Services Examination Previous Year Question (PYQ)**

#### **Mains:**

**Q.** Discuss the recent measures initiated in disaster management by the Government of India departing from the earlier reactive approach. **(2020)**

**Q.** Vulnerability is an essential element for defining disaster impacts and its threat to people. How and in what ways can vulnerability to disasters be characterized? Discuss different types of vulnerability with reference to disasters. **(2019)**

**Q.** Describe various measures taken in India for Disaster Risk Reduction (DRR) before and after signing 'Sendai Framework for DRR (2015-30)'. How is this framework different from 'Hyogo Framework for Action, 2005'? **(2018)**