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## INSTITUTIONAL FRAMEWORKS FOR RISK AND DISASTER MANAGEMENT – NDMA AND SDMA

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### Introduction

Disaster management in India has undergone a significant transformation in recent decades. Traditionally, the focus was on post-disaster relief and rehabilitation, with ad-hoc committees providing temporary support after natural calamities. However, the increasing frequency and intensity of disasters—such as cyclones, floods, droughts, landslides, and industrial accidents—made it clear that a reactive model was insufficient.

The turning point came with the Disaster Management Act, 2005, which created a structured and legal framework for disaster governance. This Act institutionalized disaster risk reduction (DRR) across all levels of government and emphasized a proactive, holistic approach encompassing mitigation, preparedness, response, and recovery.

### The institutional setup includes

- National Disaster Management Authority (NDMA) at the national level.
- State Disaster Management Authorities (SDMAs) at the state level.
- District Disaster Management Authorities (DDMAs) at the district level.
- Local authorities such as municipalities and panchayats.

This multi-tier system ensures both top-down policy formulation and bottom-up

implementation, aligning with international frameworks like the Sendai Framework for Disaster Risk Reduction (2015–2030).

### Need for Institutional Frameworks

India is ranked among the most disaster-prone countries globally. The combination of geographical diversity (Himalayan mountains, Indo-Gangetic plains, coastal areas) and climatic variability (monsoons, droughts, cyclones) creates multiple hazards.

The need for institutional frameworks arises from:

1. Clarity of roles – Multiple agencies operate during disasters. Without a clear institutional setup, responsibilities overlap, causing inefficiency.
2. Proactive management – Frameworks shift the focus from reactive relief to risk reduction and preparedness.
3. Community resilience – Institutions empower communities to take part in disaster planning and response.
4. Integration with development – Infrastructure, housing, agriculture, and urban planning must account for disaster resilience.

### The Disaster Management Act, 2005 (legal backbone)

The Act establishes roles and empowers authorities across levels. Commonly referenced provisions include:

- **Section 3 & 6:** Establish and define NDMA (PM as Chairperson); powers to lay down policies, approve national plans, issue guidelines to ministries/states.
- **Section 8:** National Executive Committee (NEC)—implements NDMA policies; prepares the National Plan.
- **Section 14 & 20:** SDMA and State Executive Committee (SEC)—mirror national roles at state level (CM chairs SDMA; Chief Secretary chairs SEC).
- **Section 25:** District Disaster Management Authority (DDMA)—Collector as Chair; prepares DDMP; coordinates district response.
- **Sections 46–48:** NDRF/SDRF/NDMF/SDMF—financial architecture for response and mitigation.
- **Sections 51–60:** Offences & penalties—deterrence for obstruction, false claims, misappropriation, or failure to comply.

#### **Four-Level Architecture (how it actually works)**

1. **National:** NDMA sets policy/guidelines; NEC operationalizes; NIDM trains; NDRF responds.
2. **State:** SDMA contextualizes policy; SEC coordinates departments; state plans (SDMP) drive budgets.
3. **District:** DDMA prepares DDMP (hazard, vulnerability, capacity analysis; resource inventory; EOC procedures); runs mock drills.
4. **Local:** ULBs/Panchayats implement building by-laws, maintain shelters, manage drainage, run ward committees, mobilize volunteers (e.g., Aapda Mitra).

#### **Vision and Objectives of NDMA**

- To mainstream Disaster Risk Reduction (DRR) into development planning so that all development activities, policies, and projects are designed with risk awareness and resilience in mind.
- To create a culture of preparedness at every level by promoting awareness, conducting training and mock drills, and ensuring communities and institutions are ready to respond effectively during emergencies.
- To facilitate capacity building through continuous training, education, and knowledge sharing among officials, volunteers, and local communities for better disaster management practices.
- To promote the use of technology, including GIS-based risk mapping, remote sensing, and real-time monitoring, to enhance forecasting, planning, and decision-making during disasters.
- To empower communities for local-level resilience by strengthening their participation, self-reliance, and ability to respond and recover from disasters effectively.

#### **NDMA in Practice**

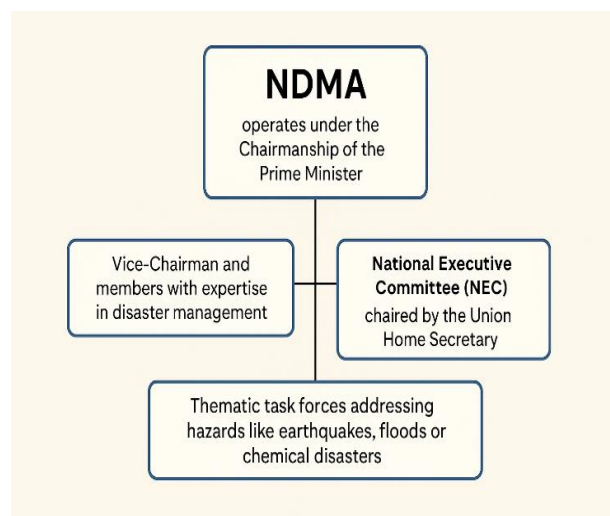
**Vision:** “Safer, disaster-resilient India.”

#### **Policy instruments NDMA uses:**

- National Guidelines (e.g., heatwaves, cyclones, floods, earthquakes, chemical/industrial safety, hospital safety, school safety, urban flood management).
- National Plan & review mechanisms for ministries/states.

- Funding leverage: Aligns central schemes and compels DRR mainstreaming in sectoral programs.
- Technology adoption: Common Alerting Protocol (CAP) expansion, GIS risk atlases, decision-support dashboards with IMD/INCOIS/ISRO.
- Public-private-civil partnerships: Telecom for cell broadcast alerts; industry for onsite/offsite safety; NGOs for community preparedness.

**Organizational Structure of NDMA**



**Fig.1.Organizational structure of NDMA**

**Source: Authors Work**

**Functions of the National Disaster Management Authority (NDMA)**

The National Disaster Management Authority (NDMA) formulates policies and guidelines that serve as a framework for disaster preparedness, mitigation, and response across the nation. These guidelines help ensure a coordinated and effective approach among different levels of government and agencies. It approves national and state disaster management plans, ensuring that both central and state authorities work in alignment with national goals while addressing local and regional vulnerabilities effectively.

The NDMA ensures the implementation of mitigation strategies aimed at reducing disaster risks through structural safety measures, capacity enhancement, and the integration of disaster resilience into developmental activities. It coordinates capacity-building programs by organizing training sessions, awareness campaigns, and workshops for officials, institutions, and communities to strengthen their disaster management capabilities.

The authority promotes research and innovation by supporting studies and technological advancements that improve disaster forecasting, early warning systems, and risk assessment. It also allocates and monitors funds for various disaster management projects, ensuring that resources are efficiently utilized for preparedness, mitigation, and recovery activities.

**National Executive Committee (NEC)**

The NEC plays a critical role in India's disaster management framework, acting as the operational arm of the National Disaster Management Authority (NDMA). Its functions include preparing the National Disaster Management Plan (NDMP), which serves as a guideline for disaster preparedness and response across the country. The NEC coordinates activities between central and state-level agencies to ensure a unified and effective approach during emergencies. It also advises the NDMA on technical and operational issues, providing expert guidance for decision-making. During disasters, the NEC manages crisis communication, ensuring timely information flow to authorities and the public. Additionally, the NEC ensures that disaster management strategies are integrated across key ministries, including agriculture, health, and infrastructure, making DRR a cross-sectoral priority. This coordination strengthens both preparedness and resilience at the national level.

**National Institute of Disaster Management (NIDM)**

The National Institute of Disaster Management (NIDM) serves as the apex training and research institution in the field of disaster management in India. It plays a vital role in strengthening the country's capacity to handle disasters through education, research, and skill development initiatives. NIDM conducts research and policy analysis to provide evidence-based recommendations for improving disaster risk reduction and management strategies. Its studies help in formulating effective policies that address emerging challenges in disaster governance.

It develops curricula and training modules tailored for government officials, disaster professionals, and community volunteers. These programs enhance understanding of disaster preparedness, response mechanisms, and mitigation strategies. The institute organizes simulation exercises and workshops to provide practical experience in managing disaster scenarios. Such exercises help participants build confidence and improve coordination during real-life emergencies. NIDM also collaborates with universities, international organizations, and UN agencies to promote global knowledge exchange and best practices in disaster management. These partnerships strengthen academic and professional capacities across institutions.

**National Disaster Response Force (NDRF)**

The National Disaster Response Force (NDRF) is a specialized unit established for effective disaster response and relief operations across India. It functions under the National Disaster Management Authority (NDMA) and plays a frontline role in handling both natural and man-made disasters. The NDRF is drawn from various paramilitary forces, ensuring discipline, efficiency, and quick mobilization during

emergencies. Its personnel are selected and trained to perform specialized tasks in disaster situations.

It is trained in search, rescue, and relief operations, enabling the force to save lives and provide immediate assistance to affected communities during floods, earthquakes, cyclones, and other disasters. The NDRF is equipped to handle CBRN (Chemical, Biological, Radiological, and Nuclear) emergencies, making it capable of responding to hazardous incidents that require specialized knowledge and safety measures.

**State Disaster Management Authorities (SDMAs)**

The State Disaster Management Authorities (SDMAs) play a crucial role in decentralizing disaster management and ensuring that preparedness and response efforts are effectively implemented at the state and district levels. They serve as the nodal agencies for planning, coordination, and execution of disaster management activities within each state. Each SDMA is headed by the Chief Minister, which ensures strong leadership and political commitment in implementing disaster management policies and programs. This leadership structure helps integrate disaster management with state development priorities.

SDMAs are responsible for preparing and approving state and district disaster management plans, which outline strategies for mitigation, preparedness, response, and recovery. These plans are tailored to address the specific hazards and vulnerabilities of each region. They coordinate the activities of various state departments to ensure that disaster management efforts are cohesive and efficiently executed. Inter-departmental coordination helps in effective resource utilization and timely decision-making during emergencies.

SDMAs also promote public-private partnerships by engaging industries, NGOs, and community-based organizations in disaster preparedness and risk reduction initiatives. Such collaborations enhance innovation, funding, and local participation in disaster resilience programs. In addition, they organize state-level drills, training sessions, and awareness campaigns to educate citizens, strengthen institutional capacity, and improve readiness at all administrative levels.

### **State Disaster Management Authority (SDMA)**

The SDMA is chaired by the Chief Minister and serves as the apex policy-making body for disaster management in the state. It is responsible for laying down the state disaster management policy, which guides all disaster preparedness and mitigation activities. The authority approves both the State Disaster Management Plan (SDMP) and the District Disaster Management Plans (DDMPs), ensuring that these plans are comprehensive and effective. SDMA also emphasizes the integration of disaster risk reduction (DRR) measures into the schemes of all state departments. By doing so, it ensures that development projects consider potential disaster impacts from the planning stage. Furthermore, the SDMA promotes public-private partnerships (PPP) to strengthen disaster resilience across communities. It also orders and monitors mock drills to test and improve the response capacity of government agencies and local communities.

### **State Executive Committee (SEC)**

The SEC, chaired by the Chief Secretary, handles the day-to-day operational coordination of disaster management activities across all state departments. It provides guidance and issues directions to departments to ensure timely preparedness and effective response during disasters. The SEC also offers technical support to District Disaster Management Authorities

(DDMAs), helping them develop and implement localized disaster management strategies. Additionally, it evaluates the overall state preparedness for various hazards and identifies gaps or areas for improvement. The SEC plays a key role in recommending financial releases for disaster mitigation, ensuring that necessary resources reach the implementing agencies on time. By monitoring preparedness and coordinating inter-departmental efforts, the SEC ensures a cohesive and proactive disaster management system in the state.

### **Preparedness and Early Warning Mechanisms**

The state prepares annual hazard-specific calendars for heatwaves, cyclones, and monsoon floods to ensure systematic readiness. These calendars outline the activities and responsibilities of various departments for each hazard season. The State Emergency Operations Centre (EOC) functions round-the-clock, monitoring situations, issuing Common Alerting Protocol (CAP) alerts, and activating siren grids during emergencies. Standard Operating Procedures (SoPs) at the EOC guide rapid and coordinated responses. Disaster risk reduction measures are integrated into Detailed Project Reports (DPRs) of state development projects, ensuring that infrastructure and services are designed to withstand hazards. The state also partners with scientific institutions such as IMD, ISRO, and IITs for advanced nowcasting, flood modeling, and landslide early warning systems. These collaborations improve accuracy in forecasts and enable timely preventive actions.

### **Tamil Nadu SDMA (TNSDMA) – institutional innovations**

- SEOC (24×7) with GIS dashboards (river gauges, reservoirs, tidal forecasts, rainfall nowcast); multilingual warnings.
- Departmental convergence: Revenue & DM (nodal), Police, Fire & Rescue, Health, PWD

(drainage/embankments), Fisheries (coastal warnings), School Edn. (school safety), Animal Husbandry (relief for livestock).

- University links: IIT-Madras (urban flood modeling), collaboration with IMD/ISRO for meteorology and earth observation.
- Community-based preparedness: Coastal evacuation routes, signage, shelters, mock drills pre-Northeast Monsoon.
- After 2015 floods: Investments in storm-water drainage, lake interconnections, pumped discharge, and ward-level flood hotlines; city EOC procedures refined.

#### National & State Schemes

- **NCRMP:** Cyclone shelters, early warning, embankments, evacuation roads—saves lives and protects livelihoods (fishing, salt pans).
- **Urban Flood Management:** Mapping of floodplains, detention basins, storm-water upgrades, lake interlinks; city EOCs & pump grids.
- **NERMP / Hospital & School Safety:** Retrofitting public buildings; drills; safe-evacuation routes; non-structural safety (fixing shelves, securing cylinders).
- **Community-Based DRR / Aapda Mitra:** Trained volunteers as the “first three hours” responders; improves last-mile effectiveness.
- **District Disaster Management Plans:** 38 districts in TN (example) with hazard-specific annexes; annual updates and drills.

#### Conclusion

A decade of institution-building has laid credible foundations. Strength now lies in last-mile capability, urban resilience, and data-driven operations. Make mitigation a budget line item, lock preparedness into annual calendars, and

keep communities at the center. With NDMA’s policy spine, SDMA/DDMA’s contextual muscle, local bodies’ ground truth, and science-tech partnerships, India can move from managing disasters to managing risk—the essence of resilience

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