

HANDBOOK FOR IAS OFFICERS **DISASTER MANAGEMENT & DISASTER RISK REDUCTION**

ONE-DAY ORIENTATION PROGRAMME FOR IAS PROBATIONERS

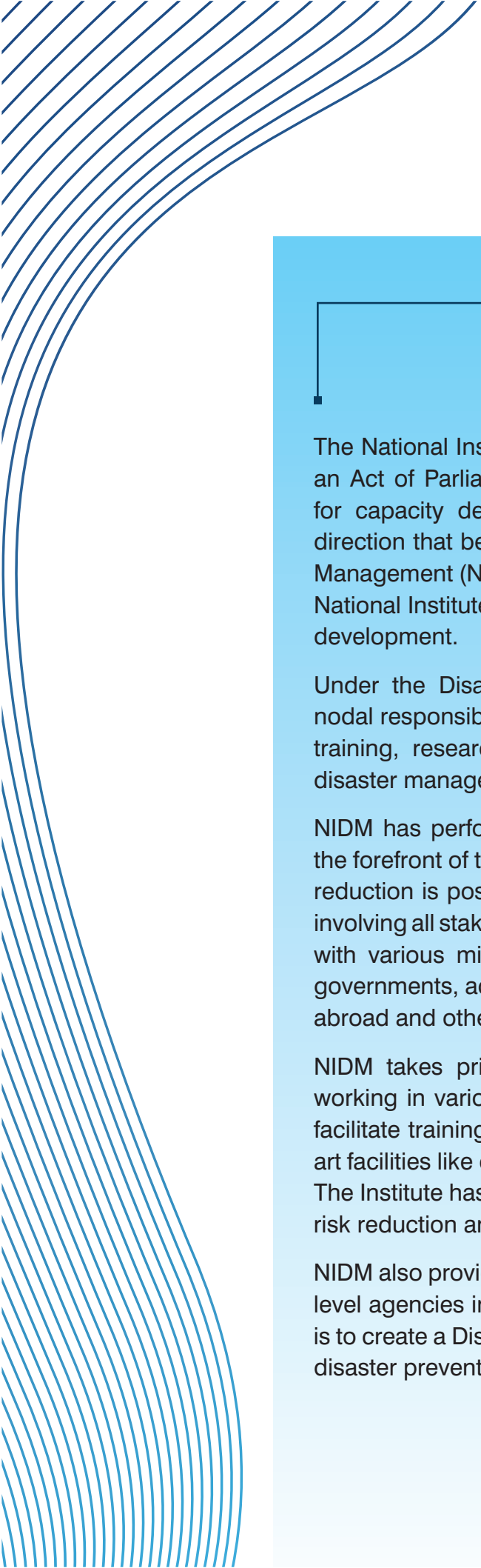


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About NIDM

The National Institute of Disaster Management (NIDM) was constituted by an Act of Parliament with a vision to play the role of a premier institute for capacity development in India and the region. The efforts in this direction that began with the formation of the National Centre for Disaster Management (NCDM) in 1995 gained impetus with its re-designation as the National Institute of Disaster Management (NIDM) for training and capacity development.

Under the Disaster Management Act 2005, NIDM has been assigned nodal responsibilities for human resource development, capacity building, training, research, documentation and policy advocacy in the field of disaster management.

NIDM has performed a crucial role in bringing disaster risk reduction to the forefront of the national agenda. The Institute believes that disaster risk reduction is possible only through promotion of a “Culture of Prevention” involving all stakeholders. The Institute works through strategic partnerships with various ministries and departments of the central, state and local governments, academic, research and technical organizations in India and abroad and other bi-lateral and multi-lateral international agencies.

NIDM takes pride in having a multi-disciplinary team of professionals working in various aspects of disaster risk reduction. In its endeavour to facilitate training and capacity development, the Institute has state-of-the-art facilities like class rooms, seminar hall, video-conferencing facilities etc. The Institute has a well-stocked library exclusively on the theme of disaster risk reduction and management.

NIDM also provides capacity building support to various National and State level agencies in the field of Disaster Risk Reduction. The Institute’s vision is to create a Disaster Resilient India by building the capacity at all levels for disaster prevention and preparedness.

HANDBOOK FOR IAS OFFICERS FOR DISASTER MANAGEMENT & DISASTER RISK REDUCTION



Message From The Executive Director



Dear Colleagues,

This one-day orientation programme for IAS officers of 2024 batch marks the beginning of a significant partnership between National Institute of Disaster Management (NIDM) and LBSNAA, Mussoorie. I am delighted to welcome young IAS officers to NIDM for this Orientation Programme. Under the Disaster Management Act, 2005, NIDM is the apex institution for training, research and capacity building in disaster risk reduction. Since inception, NIDM has been supporting national and state governments in building a culture of prevention and preparedness.

As future District Magistrates, you will be the pivot of India's disaster management system at the grass root level where policy, law and field realities converge. This handbook and the Orientation Programme are designed to assist you in implementing the national policies and various schemes for preparedness, mitigation, response, relief, recovery and reconstruction. This handbook draws upon the lessons learnt from recent events, our commitments at various international forums, and the Hon'ble Prime Minister's ten-point agenda on Disaster Risk Reduction (DRR). I hope you will consider NIDM as your long-term knowledge partner in this journey towards building a more disaster resilient India.

The young officers attending this orientation programme represent not only the future leadership, but also the energy, hope and capability that will shape India's progress in the coming decades. As you prepare for public service, may you carry forward a deep commitment to resilience, inclusion and preparedness in every decision you make. NIDM conveys its warmest best wishes to each one of you, with the hope that you will contribute meaningfully and effectively to national growth, effective governance and the larger collective journey towards building a Viksit Bharat.



Madhup Vyas, IAS

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ORIENTATION NOTE

USING THIS HANDBOOK

This handbook accompanies a one-day orientation programme on disaster management for IAS probationers. The content is structured around eight core chapters that map directly to the instructional sessions of the day.

LEARNING OBJECTIVES

By the end of the programme, participants should be able to:

- Explain the rationale behind India's transition from a relief-centric approach to a disaster risk reduction framework, and analyse the substantive changes introduced through the 2025 Amendment to the Disaster Management framework.
- Describe the specific roles and responsibilities of the District Magistrate in all phases of disaster management .
- Understand the disaster financing architecture recommended by the Sixteenth Finance Commission, including fund structures, cost-sharing arrangements and corresponding administrative obligations.
- Incorporate disaster risk reduction considerations into routine governance and administrative decision-making processes.
- Apply the statutory terminology and concepts in official communications, damage assessments, administrative orders, and correspondence with higher authorities with respect to the subject.
- Examine the key coordination and governance challenges encountered at the district level, along with the statutory mechanisms available to address them effectively

Chapter 1:

Disaster Profile

1.1 Geographical Settings of the Country

India possesses remarkable geographical diversity, which significantly influences its climate, ecology, economy, culture, and disaster vulnerability profile. Stretching from the snow-covered Himalayan mountain ranges in the north to the coastal and forested regions of the south, from the fertile Brahmaputra valley in the east to the arid Thar Desert in the west, India exhibits a wide variety of landforms, climatic conditions, ecosystems, and natural resources. Covering an area of approximately 3.28 million square kilometres, India is the seventh largest country in the world in terms of geographical area¹. The country lies entirely in the Northern Hemisphere between latitudes 8°4' North to 37°6' North and longitudes 68°7' East to 97°25' East. India has a vast land frontier of about 15,200 kilometres and a coastline extending approximately 11098 kilometres, including the mainland coastline as well as the coastlines of the Andaman & Nicobar Islands and Lakshadweep Islands². This extensive geographical spread contributes to diverse climatic conditions and ecological zones across the country.

Physically, India is generally divided into six major physiographic divisions, namely the Himalayan mountain system, the Indo-Gangetic plains, the desert region, the Peninsular Plateau, the coastal plains and islands, each having distinct topographical and geological characteristics. The Himalayan mountain system forms the northern boundary of the country and extends for nearly 2,400 kilometres from Jammu & Kashmir in the west to Arunachal Pradesh in the east³. The Himalayas are among the youngest and highest fold mountains in the world and include several prominent peaks, glaciers, valleys, and mountain passes. This region plays a crucial role in influencing India's climate by acting as a barrier against cold Central Asian winds and by intercepting monsoon winds, leading to rainfall across northern India. The Himalayan region is also the source of many perennial rivers such as the Ganga, Yamuna, and Brahmaputra, which support agriculture, hydropower generation, and livelihoods for

¹Ministry of Environment, Forest and Climate Change, "Union Minister Bhupender Yadav Releases India State of Forest Report 2023," PIB Delhi, December 21, 2024, <https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2086742>.

²Ministry of Earth Sciences, "PARLIAMENT QUESTION: Coastline of the Country," PIB Delhi, December 4, 2025, <https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=2198800>.

³Suresh K. Rana et al., "200 Years of Research on Himalayan Biodiversity: Trends, Gaps, and Policy Implications," *Frontiers in Ecology and Evolution* 8 (January 2021): 603422, <https://doi.org/10.3389/fevo.2020.603422>.

millions of people. However, the region is highly vulnerable to earthquakes, landslides, glacial lake outburst floods (GLOFs), avalanches, and flash floods due to its fragile geology and active tectonic conditions.

South of the Himalayas lie the Indo-Gangetic plains, one of the largest and most fertile alluvial plains in the world. These plains have been formed by the depositional activities of major river systems, including the Indus, Ganga, and Brahmaputra, along with their tributaries. Extending across states such as Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal, and Assam, these plains support dense populations and intensive agricultural activities due to their fertile soils and availability of water resources. The region is considered the agricultural heartland of India and is known for large-scale cultivation of crops such as wheat, rice, sugarcane, and pulses. However, the Indo-Gangetic plains are highly prone to floods, riverbank erosion, waterlogging, and seasonal droughts, especially in the Brahmaputra and Ganga basins.

The western part of India is characterized by the Thar Desert, also known as the Great Indian Desert, located mainly in Rajasthan and extending into parts of Gujarat, Punjab, and Haryana. This region experiences extremely low rainfall, high temperatures, sparse vegetation, and sandy terrain. Water scarcity and desertification are major environmental challenges in this region. Despite harsh climatic conditions, the desert region supports unique ecosystems, pastoral activities, and traditional livelihoods adapted to arid conditions. Periodic droughts and dust storms are common hazards affecting the region.

The Peninsular Plateau occupies a large part of southern India and is considered one of the oldest and most stable landmasses of the Earth's crust. It is triangular in shape and bordered by the Western Ghats on the western side and the Eastern Ghats on the eastern side. The plateau region is rich in mineral resources such as coal, iron ore, manganese, bauxite, and mica, making it important for industrial development and mining activities. Major rivers such as the Godavari, Krishna, Kaveri, and Narmada originate in this region and flow toward the Bay of Bengal or the Arabian Sea. The Western Ghats, recognized as a global biodiversity hotspot, play a crucial role in influencing rainfall patterns and supporting diverse flora and fauna. However, parts of the peninsular region are vulnerable to droughts, cyclones, landslides, and forest fires.

The Coastal plains are narrow low-lying flat landforms between the Eastern Ghat and Bay of Bengal called Eastern Coastal Plains and Western Ghat and Arabian seas called Western Coastal Plains of India. Due to their proximity to the sea, they are highly exposed to hazards like cyclones, storm surges, coastal erosion, flooding, and sea-level rise, specially in view of the recent global anthropogenic climate change.

The islands of India include the Andaman and Nicobar Islands in the Bay of Bengal and the Lakshadweep Islands in the Arabian Sea. These islands are ecologically sensitive and highly vulnerable to hazards such as tsunamis, cyclones, coastal erosion, and rising sea levels.

1.2 Hazard and Vulnerability Profile

India is recognized as one of the most disaster-prone countries in the world due to its diverse geo-climatic conditions, environmental challenges, and socio-economic vulnerabilities. The country is exposed to a wide range of natural hazards such as earthquakes, floods, cyclones, droughts, landslides, avalanches, heatwaves, cold waves, lightning, thunderstorms, and coastal hazards. Frequent disasters result in significant loss of lives, livelihoods, infrastructure, agricultural productivity, and economic resources, thereby affecting sustainable development and national growth. India's vast geographical diversity, large population, rapid urbanization, environmental degradation, and climate variability collectively contribute to its increasing disaster risk profile.

1.2.1 Geo-Climatic and Hazard Vulnerability

India's geographical and climatic characteristics make it highly susceptible to multiple hazards. Approximately 59 percent of the country's landmass falls under moderate to severe seismic zones (Zones III, IV, and V), making large parts of the Himalayan region, North-Eastern states, Gujarat, Bihar, Uttarakhand, Himachal Pradesh, and the Andaman & Nicobar Islands vulnerable to earthquakes⁴. The Himalayan mountain range, being geologically young and tectonically active, experiences frequent seismic activity. Rapid urbanization, unsafe construction practices, and non-compliance with seismic-resistant building standards further increase earthquake risks in urban centres. Major events such as the Gujarat Earthquake (2001) and the Kashmir Earthquake (2005) demonstrated the devastating impacts of seismic disasters in India.

Floods are among the most recurrent and widespread disasters affecting the country. Nearly 40 million hectares of land are flood-prone, especially in the Ganga-Brahmaputra basin covering states such as Assam, Bihar, Uttar Pradesh, and West Bengal⁵. Floods are caused by heavy monsoon rainfall, overflowing rivers, embankment breaches, poor drainage systems, cloudbursts, and glacial lake outburst floods (GLOFs). Urban flooding has also emerged as a major concern in cities like Mumbai, Chennai, Bengaluru, Hyderabad, and Delhi due to unplanned urbanization, concretization of land surfaces, encroachment of wetlands, and inadequate drainage infrastructure.

India's coastline of about 11098 kilometres exposes coastal regions to cyclones, storm surges, coastal flooding, and tsunamis. The eastern coast bordering the Bay of Bengal is particularly vulnerable because it generates a large number of severe cyclonic storms. States such as Odisha, Andhra Pradesh, Tamil Nadu, and West Bengal are frequently affected by cyclones accompanied by heavy rainfall and high-speed winds. Events such as the Odisha Super Cyclone (1999), Cyclone Fani (2019), Cyclone Amphan (2020), and Cyclone Tauktae (2021) caused widespread destruction to housing, infrastructure, agriculture, and coastal livelihoods.

⁴Ministry of Earth Sciences, "Seismic Mapping", <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1740656®=3&lang=2>

⁵Ministry of Jal Shakti, "Flood Prevention in the Country," PIB Delhi, December 20, 2021, <https://www.pib.gov.in/www.pib.gov.in/Pressreleaseshare.aspx?PRID=1783531>.

Drought is another major hazard affecting India, particularly because a large proportion of the population depends on agriculture and monsoon rainfall. Approximately 68 percent of cultivable land is vulnerable to drought conditions⁶. States such as Rajasthan, Gujarat, Maharashtra, Karnataka, Telangana, and parts of central India frequently experience water scarcity, crop failures, and agricultural distress due to erratic rainfall and prolonged dry spells. Similarly, landslides are common in the Himalayan region and the Western Ghats due to fragile geology, heavy rainfall, deforestation, slope instability, and infrastructure development activities. In recent years, climate-induced hazards such as heatwaves, cold waves, lightning, and extreme rainfall events have increased significantly. Rising global temperatures and changing climatic patterns have intensified the frequency and severity of extreme weather conditions, making climate change a major threat multiplier for disaster risks in India.

1.2.2 Environmental and Developmental Challenges

Environmental degradation and unsustainable developmental practices have significantly aggravated disaster vulnerabilities across the country. Deforestation, destruction of wetlands, mining activities, encroachment of river floodplains, and unplanned urban expansion have weakened natural ecosystems that traditionally acted as buffers against disasters. Wetlands and mangroves that help absorb floodwaters and reduce cyclone impacts are increasingly being degraded due to developmental pressures and land-use changes.

Rapid and unplanned urbanization has created new forms of disaster risks. Many cities face severe infrastructure stress due to population growth, traffic congestion, poor waste management, inadequate drainage systems, and unauthorized constructions. Encroachment of natural drainage channels and concretization of urban spaces increase the risk of urban flooding during heavy rainfall events. Informal settlements located in hazard-prone areas often lack resilient housing, sanitation, healthcare facilities, and emergency infrastructure, making urban poor populations highly vulnerable during disasters.

Infrastructure development in ecologically fragile regions, particularly in the Himalayan states, has also increased environmental risks. Road construction, hydropower projects, quarrying, and tourism-related activities have destabilized hill slopes and increased the frequency of landslides and flash floods. Climate change further compounds these challenges by causing glacier retreat, sea-level rise, changing rainfall patterns, and more frequent extreme weather events.

1.2.3 Socio-Economic Vulnerabilities and Disaster Risks

Socio-economic conditions significantly influence disaster vulnerability. High population density, poverty, unemployment, lack of awareness, weak enforcement of regulations, and inadequate preparedness capacities increase the exposure and susceptibility of communities

⁶CS Murthy and MVR Sessa Sai, "Agricultural Drought Monitoring and Assessment," in Remote Sensing Applications (National Remote Sensing Centre, n.d.), https://www.nrsc.gov.in/nrscnew/assets/pdf/ebooks/Chap_13_AgricultureDroughtMonitoring.pdf.

to disasters. A large segment of the population depends on climate-sensitive sectors such as agriculture, fisheries, forestry, and livestock for livelihoods, making them highly vulnerable to climate variability and natural hazards.

Marginalized groups, including women, children, elderly persons, persons with disabilities, migrants, and economically weaker sections, are disproportionately affected during disasters. Limited access to healthcare, education, communication systems, financial resources, and social protection mechanisms further reduces their coping capacities. Rural and remote areas often face shortages of critical infrastructure such as roads, hospitals, communication networks, and emergency response services, which hamper effective disaster response and recovery.

The COVID-19 pandemic also highlighted the growing importance of biological and public health emergencies within the disaster management framework. The pandemic exposed gaps in healthcare infrastructure, supply chain management, migrant welfare systems, and emergency preparedness mechanisms.

Therefore, India's disaster vulnerability is shaped by the combined influence of natural hazards, environmental degradation, climate change, rapid urbanization, and socio-economic inequalities. Addressing these challenges requires a comprehensive and integrated disaster risk reduction approach focusing on prevention, mitigation, preparedness, climate resilience, sustainable development, environmental conservation, resilient infrastructure, community participation, and effective governance. Strengthening institutional capacities, improving early warning systems, promoting risk-informed development planning, and enhancing local preparedness are essential for building a safer and disaster-resilient India.



Chapter 2:

Paradigm Shift in Disaster Management

Disaster management in India has undergone a major transformation over the last two decades. Traditionally, the country followed a relief-centric and reactive approach toward disasters, where government interventions largely focused on post-disaster rescue operations, relief distribution, compensation, and rehabilitation measures. Disaster management was viewed mainly as an emergency response activity rather than a long-term developmental and governance issue. Institutional mechanisms for preparedness, mitigation, and risk reduction were limited, and disaster response systems were often activated only after the occurrence of disasters. As a result, disasters repeatedly caused extensive human suffering, infrastructure damage, economic losses, and developmental setbacks across the country.

However, increasing disaster occurrences, rapid urbanization, environmental degradation, climate change impacts, and rising economic losses highlighted the inadequacy of this traditional approach. Major disasters such as the Odisha Super Cyclone (1999), Gujarat Earthquake (2001), and Indian Ocean Tsunami (2004), recurring floods, droughts, cyclones, and heatwaves demonstrated the urgent need for a more systematic and proactive disaster management framework. Consequently, India adopted a comprehensive and integrated approach toward disaster management that emphasizes prevention, mitigation, preparedness, capacity building, resilience, and risk reduction. This transformation is widely referred to as the “Paradigm Shift in Disaster Management”.

2.1 Disaster Management Act

The Disaster Management Act, 2005, provided the first comprehensive legal framework for disaster management in the country. Before the enactment of the Act, disaster management was primarily handled through relief administration mechanisms under different government departments without a dedicated institutional structure or integrated planning process. The Act recognized disaster management as a continuous and multi-dimensional process involving prevention, mitigation, preparedness, response, recovery, and rehabilitation.

One of the most important contributions of the Act was the institutionalization of disaster management structures at the national, state, and district levels. It established the National

Disaster Management Authority (NDMA) under the chairmanship of the Prime Minister to formulate policies, guidelines, and plans for disaster management. Similarly, State Disaster Management Authorities (SDMAs), chaired by Chief Ministers and District Disaster Management Authorities (DDMAs), chaired by District Collectors, were established to strengthen decentralized planning and implementation mechanisms.

The Act also led to the creation of the National Disaster Response Force (NDRF), a specialized force trained specifically for disaster response and search-and-rescue operations. The establishment of the National Institute of Disaster Management (NIDM) strengthened capacity-building, research, policy support, and training activities related to disaster risk reduction and management.

Importantly, the DM Act, 2005, emphasized that disaster management should not be limited to post-disaster relief activities alone. Instead, it highlighted the importance of risk assessment, prevention, preparedness, mitigation, and community participation as central elements of disaster governance. This marked a major shift from emergency response administration to a comprehensive disaster risk reduction framework.

The Disaster Management (Amendment) Act, 2025, introduces significant changes to the Disaster Management Act, 2005, intending to strengthen India's disaster governance framework and proactive disaster risk reduction and resilience-based approach. The 2025 amendment expands the scope by formally incorporating concepts such as disaster risk reduction (DRR), resilience, vulnerability, exposure, hazard, recovery, and evacuation. The amendment also recognizes emerging challenges arising from climate change, rapid urbanization, and the increasing frequency of extreme events. A major addition is the provision for Urban Disaster Management Authorities and urban disaster management plans to specifically address risks such as urban flooding, heatwaves, industrial accidents, and building collapses. The amendment further strengthens institutional coordination by providing for mechanisms such as the National Crisis Management Committee (NCMC) and High-Level Committee (HLC). It also promotes technology-driven governance through the establishment of a national disaster database containing information related to hazards, risk assessment, preparedness, mitigation plans, and disaster-related fund utilization. Another important change is the enhancement of preventive and responsive powers of the Central and State Governments for disaster preparedness and mitigation. Additionally, the amendment clarifies that ordinary law-and-order situations are not to be treated as disasters under the Act. Overall, the 2025 amendment modernizes the legal framework of disaster management in the country and aligns it more closely with international frameworks such as the Sendai Framework for Disaster Risk Reduction (SFDRR) and Conference of the Parties (COP).

2.2 National Policy on Disaster Management

The National Policy on Disaster Management (NPDM), 2009, further strengthened the paradigm shift by clearly articulating India's vision of building a "Safe and Disaster Resilient India". The policy recognized that disasters are developmental challenges that

require integrated planning, institutional coordination, scientific risk assessment, and long-term resilience-building measures. The NPDM emphasized moving away from the “erstwhile relief-centric approach” toward a prevention, preparedness, and mitigation-driven framework. It promoted the integration of Disaster Risk Reduction (DRR) into developmental planning across sectors such as housing, infrastructure, agriculture, health, education, water resources, and urban planning.

The policy highlighted the importance of:

- Community participation in disaster management
- Inclusive and gender-sensitive approaches
- Capacity building at all administrative levels
- Technology integration and scientific forecasting
- Environmental sustainability and climate adaptation
- Strengthening early warning systems and communication networks.

The NPDM also recognized the importance of involving civil society organizations, academic institutions, private sector agencies, media, and local communities in disaster risk reduction initiatives.

2.3 National Disaster Management Plan

The NDMA prepared India’s first comprehensive National Disaster Management Plan (NDMP) 2016 under the provisions of the Disaster Management Act, 2005. The plan aimed to make India disaster-resilient by reducing risks to life, livelihoods, infrastructure, and the environment through a holistic and integrated approach to disaster management. It marked a significant shift from a relief-centric approach to a proactive strategy focused on prevention, mitigation, preparedness, response, recovery, and reconstruction. The plan was aligned with the SFDRR (2015–2030) and emphasized understanding disaster risks, strengthening disaster governance, investing in disaster risk reduction, and enhancing preparedness for effective response and recovery with the principle of “Build Back Better”. NDMP 2016 clearly defined the roles and responsibilities of the central government, state governments, district authorities, local bodies, communities, and other stakeholders. It stressed the importance of early warning systems, capacity building, community participation, use of technology, training, awareness generation, and institutional coordination in managing disasters effectively.

The revised National Disaster Management Plan (NDMP) 2019 was released to incorporate emerging challenges, lessons from recent disasters, and evolving global commitments related to sustainable development and climate change. The revision integrated the principles of the Sustainable Development Goals (SDGs), the Paris Climate Agreement, and the Sendai Framework into disaster management planning. It expanded the scope of hazards covered under the plan by including heat waves, biological and public health emergencies, forest fires, cloudbursts, glacial lake outburst floods, lightning, thunderstorms, dust storms, and other

climate-induced disasters. The revised plan also emphasized social inclusion by focusing on women, children, elderly persons, differently abled individuals, and vulnerable communities. It promoted mainstreaming disaster risk reduction into development planning and highlighted the need for climate-resilient infrastructure, the use of social media and digital technology, improved early warning systems, and community-based disaster preparedness. Overall, NDMP 2019 strengthened country's disaster management framework by making it more inclusive, technology-driven, multi-hazard oriented, and aligned with global best practices.

2.4 Shift from Relief-Centric to Prevention and Mitigation-Oriented Approach

Earlier, Government agencies were largely engaged in emergency response activities rather than long-term risk reduction and preparedness planning. However, repeated disaster events demonstrated that post-disaster response alone could not effectively minimize losses or reduce vulnerabilities. Therefore, country adopted a comprehensive disaster risk reduction approach emphasizing prevention, mitigation, preparedness, and resilience-building.

2.4.1 Prevention and Risk Assessment

The contemporary disaster management framework emphasizes understanding and assessing disaster risks before disasters occur. Scientific risk assessment has become an important component of planning and decision-making processes.

Hazard mapping, vulnerability analysis, and risk zonation studies are increasingly conducted using technologies such as:

- Geographic Information Systems (GIS)
- Remote sensing
- Satellite imagery
- Digital databases
- Climate modelling tools.

These technologies help identify vulnerable regions, exposed populations, critical infrastructure, and environmental risks. Risk-sensitive land-use planning and environmental regulations are now promoted to minimize disaster vulnerabilities.

Preparedness measures such as mock drills, evacuation planning, emergency communication systems, stockpiling of relief materials, and community awareness programmes have also become integral components of disaster management.

2.4.2 Structural and Non-Structural Mitigation Measures

Mitigation measures aim to reduce disaster impacts by minimizing vulnerabilities and strengthening resilience.

Structural mitigation includes physical and engineering interventions such as:

- Earthquake-resistant buildings
- Cyclone shelters
- Flood embankments
- Retaining walls
- Drainage systems
- Resilient roads, bridges, and public infrastructure.

Infrastructure projects are increasingly designed using hazard-resistant standards and disaster-resilient engineering principles.

Non-Structural Mitigation Measures include:

- Building regulations and land-use planning
- Enforcement of safety codes
- Environmental conservation
- Public awareness campaigns
- Disaster insurance mechanisms
- Community-based preparedness programmes.

These measures focus on improving governance, planning, awareness, and institutional capacities.

2.5 Capacity Building and Preparedness

Capacity building has become a cornerstone of country's disaster management strategy. Institutions such as the NIDM conduct training programmes, workshops, simulations, and research activities for government officials, disaster managers, emergency responders, and local communities.

Specialized response forces such as the NDRF have significantly improved India's disaster response capabilities. Mock drills, awareness campaigns, school safety programmes, and community-based disaster management initiatives are increasingly conducted to strengthen local preparedness and resilience.



Chapter 3:

Institutional Framework

The institutional framework for Disaster Management (DM) in the country is a comprehensive, multi-tier, and decentralized governance system established to ensure coordinated planning, preparedness, mitigation, response, recovery, rehabilitation, and resilience-building across the country. The framework represents a major transformation in India's approach to disaster governance, shifting from the earlier reactive and relief-centric model toward a proactive, integrated, and risk reduction-oriented system. This transition was institutionalized through the Disaster Management Act, 2005 and its amendment in 2025, which provides the legal, administrative, and institutional basis for disaster management at national, state, district, and local levels.

The enactment of the Disaster Management Act, 2005, was influenced by the increasing frequency and intensity of disasters in India and the realization that traditional relief-based approaches were inadequate for managing complex disaster risks. Major disasters such as the Odisha Super Cyclone (1999), Gujarat Earthquake (2001), and the 2004 Indian Ocean earthquake and tsunami exposed critical gaps in preparedness, coordination, response systems, and institutional capacities. These disasters highlighted the need for a robust institutional mechanism capable of ensuring integrated disaster management, scientific risk assessment, coordinated emergency response, and long-term resilience-building measures. Consequently, India adopted a structured disaster governance framework emphasizing prevention, mitigation, preparedness, and mainstreaming Disaster Risk Reduction (DRR) into developmental planning.

The institutional framework operates through coordinated mechanisms at national, state, district, and local levels and involves government agencies, scientific institutions, local bodies, community organizations, civil society groups, and specialized response forces. The framework is designed to ensure vertical and horizontal coordination among institutions and to promote a participatory and decentralized approach toward disaster risk reduction and management.

3.1 Institutional Framework at the National Level

At the national level, the Government of India provides overall policy direction, coordination, technical support, financial assistance, and specialized response capabilities through several

institutions established under the Disaster Management Act, 2005. These institutions play a central role in policy formulation, planning, capacity building, coordination, early warning dissemination, and emergency response management.

3.1.1 National Disaster Management Authority

The apex body responsible for disaster management in India is the National Disaster Management Authority (NDMA), chaired by the Prime Minister of India. The NDMA was established under the Disaster Management Act, 2005, to formulate policies, plans, and guidelines for disaster management and to ensure a coordinated and effective national response to disasters. The NDMA plays a strategic role in promoting a holistic and integrated approach toward disaster risk reduction by emphasizing:

- Prevention and mitigation
- Preparedness planning
- Capacity building
- Mainstreaming DRR into development
- Strengthening institutional resilience
- Community participation and awareness.

The NDMA issues hazard-specific guidelines covering earthquakes, floods, cyclones, landslides, urban flooding, heatwaves, biological disasters, chemical hazards, school safety, hospital safety, crowd management and many more. These guidelines assist ministries, departments, state governments, and local authorities in strengthening preparedness and mitigation measures. The authority also promotes risk-sensitive development planning and encourages integration of disaster resilience measures into infrastructure development, urban planning, housing, environmental management, and climate adaptation initiatives. In recent years, the NDMA has increasingly focused on climate resilience, urban disaster risks, technological innovation, and strengthening early warning systems.

3.1.2 National Executive Committee

The National Executive Committee (NEC) functions as the executive and coordinating body assisting the NDMA in implementing disaster management policies and plans. The NEC is chaired by the Union Home Secretary and comprises secretaries of key ministries and departments of the Government of India.

The NEC is responsible for:

- Coordinating implementation of NDMA guidelines
- Preparing the National Disaster Management Plan
- Monitoring disaster preparedness measures
- Ensuring inter-ministerial coordination

- Mobilizing resources during emergencies
- Reviewing mitigation and preparedness activities.

The NEC plays a critical role in ensuring coordination among ministries such as home affairs, health, agriculture, water resources, environment, urban development, transport, defence, and communication during disaster situations. It also facilitates the integration of disaster risk reduction measures into sectoral development programmes and policies.

3.1.3 National Institute of Disaster Management

The National Institute of Disaster Management (NIDM) serves as the premier national institute for training, research, capacity building, policy advocacy, and documentation in the field of disaster management. NIDM undertakes a wide range of activities, including:

- Conducting training programmes for government officials, disaster managers, and responders
- Developing training modules and educational materials
- Undertaking research and policy studies
- Supporting institutional strengthening initiatives
- Promoting awareness and community preparedness
- Facilitating knowledge sharing and best practices.

The institute collaborates with universities, research organizations, international agencies, state governments, and training institutions for promoting disaster education, capacity development, and research-based policy support. NIDM also plays an important role in strengthening human resource development and promoting the professionalization of disaster management in India.

3.1.4 National Disaster Response Force

The National Disaster Response Force (NDRF) is a specialized multi-disciplinary response force constituted under the Disaster Management Act, 2005, for prompt and professional response to threatening disaster situations and emergencies.

The NDRF consists of battalions drawn from various Central Armed Police Forces and is trained in:

- Search and rescue operations
- Collapsed structure rescue
- Flood rescue and boat operations
- Medical first response
- Chemical, Biological, Radiological, and Nuclear (CBRN) emergencies
- Evacuation and relief support.

The NDRF has significantly improved India's disaster response capabilities through specialized training, advanced equipment, mock exercises, and rapid deployment mechanisms. The force has played an important role in responding to major disasters such as floods, cyclones, earthquakes, landslides, industrial accidents, and the COVID-19 pandemic. The establishment of the NDRF reflects the Government of India's emphasis on professionalization, modernization, and institutional specialization in disaster response management.

3.1.5 Ten Point Agenda

India's disaster management framework is increasingly aligned with international disaster risk reduction priorities and global frameworks. The Sendai Framework for Disaster Risk Reduction significantly influenced India's disaster governance system. The framework emphasizes understanding disaster risk, strengthening disaster risk governance, investing in resilience, and enhancing preparedness and recovery. India integrated these priorities into national planning, policy frameworks, and disaster preparedness systems.

India has also demonstrated global leadership in disaster risk reduction through the Prime Minister's Ten-Point Agenda announced during the Asian Ministerial Conference on Disaster Risk Reduction (AMCDRR) 2016, held in Delhi. The 10-point agenda includes the following priorities:

- I. **All development sectors must imbibe the principles of disaster risk management** - Development and Disasters are two sides of a coin. While a planned development can reduce the risks of disasters, the absence of proper planning can aggravate them. It is, therefore, essential to imbibe a disaster risk reduction approach in all development schemes. Development should focus on reducing disaster risks and not creating them.
- II. **Risk coverage must include all, starting from poor households to SMEs to multi-national corporations to nation states** - Disasters result in loss of lives and damage to properties and assets. Those who survive face the challenges of their rehabilitation. This applies to all, from poor households to SMEs to multi-nationals. It is necessary to think big and innovatively to widen the risk insurance cover. Some bold steps have been taken to ensure financial inclusion and risk insurance for the poorest. The government has some schemes with risk coverage in consideration, which include Jan Dhan Yojana, Suraksha Bima Yojana, Fasal Bima Yojana (crop insurance), etc. There is a need for:
 - Development of disaster insurance mechanisms for home-owners in disaster-prone areas
 - Development of parametric insurance for weather and climate-related disasters
 - Develop insurance products to cover major infrastructure projects.
- III. **Women's leadership and greater involvement should be central to disaster risk management** - It is necessary to encourage greater involvement and leadership

of women in disaster risk management to support the special needs of women affected by disasters. Women are generally seen as vulnerable to disasters. But women can play an important role in disaster risk reduction at the household, society, community, and beyond. We need a large number of women volunteers, engineers, masons, and building artisans to participate in post-disaster reconstruction and promote women's self-help groups, which can assist in livelihood recovery. There is a need to include women in NDRF and SDRF, and to train elected women representatives at the local level for development.

- IV. **Invest in risk mapping globally to improve global understanding of nature and disaster risks** - Disasters know no boundary. Many natural hazards cross countries, so there is a need for a better understanding of such risks at the global level. With a shared understanding of the nature and severity of disaster risks globally, their impacts can be mitigated with better planning and preparedness. This requires undertaking multi-hazard risk assessments and developing maps for all major hazards in a standardized format to facilitate disaster risk reduction.
- V. **Leverage technology to enhance the efficiency of disaster risk management efforts** - Efforts must be made to leverage technology to enhance the efficiency of our disaster risk management efforts. This requires the use of technology in resource planning, e.g., India Disaster Resources Network (IDRN), creation of an e-platform to map expertise and resources on highly specialized aspects of disaster response, and to increase the efficacy of early warning systems for all major hazards through the application of technology.
- VI. **Develop a network of universities to work on disaster-related issues** - It will be helpful to develop a network of universities and academic institutions to work on disaster-related issues. As part of this network, different universities could specialize in multi-disciplinary research on disaster issues most relevant to them. NIDM has developed the Indian Universities and Institutes Network for Disaster Risk Reduction (IUINDRR).
- VII. **Utilise the opportunities provided by social media and mobile technologies for disaster risk reduction** - Utilise the opportunities provided by social media and mobile technologies to develop a social media strategy for Disaster Risk Management in the country. Social media is transforming disaster response. It is helping response agencies in quickly organizing themselves and enabling citizens to connect more easily with authorities.
- VIII. **Build on local capacity and initiative to enhance disaster risk reduction** - Disaster management must build on local capabilities and initiatives. The task of disaster risk management, particularly in rapidly growing economies, is so huge that formal institutions of the state can at best be instrumental in creating the enabling conditions. Specific actions have to be designed and implemented locally. Such efforts

reduce risk and create opportunities for local development and sustainable livelihoods. Localization of disaster risk reduction will also ensure that good use is made of the traditional best practices and indigenous knowledge.

- IX. **Make use of every opportunity to learn from disasters and, to achieve that, there must be studies on the lessons after every disaster** - Insure that the opportunity to learn from a disaster is not wasted. After every disaster, there is a need to undertake research studies to understand the best practices and learn lessons to improve the policy and disaster governance.
- X. **Bring about greater cohesion in international response to disasters** - Disasters' impacts are huge, and so are the needs to be prepared for and respond strategically. Across the globe, countries face disasters similar in nature and sometimes across countries. It requires a coordinated and unified response by affected countries. Pre-disaster planning and preparedness can result in effective and timely response, hence it is important to bring about greater cohesion in international response to disasters. International forums and protocols should be used in addressing disaster risks for an effective and coordinated response.

The 10-Point Agenda has significantly influenced India's contemporary disaster management approach by emphasizing resilience-building, technology integration, community participation, climate-sensitive planning, and international cooperation in disaster risk reduction. This strengthened India's role in promoting global disaster resilience initiatives.

3.2 State-Level Institutional Framework

The disaster management framework in the country follows a decentralized model that empowers states to undertake context-specific planning and implementation measures according to local hazard profiles and vulnerabilities.

3.2.1 State Disaster Management Authority

Each state has a State Disaster Management Authority (SDMA) chaired by the respective Chief Minister. The SDMA is responsible for:

- Formulating state disaster management policies
- Approving State Disaster Management Plans
- Coordinating the implementation of disaster management programmes
- Mainstreaming DRR into state development planning
- Monitoring preparedness and mitigation activities.

The SDMAs ensure that national guidelines issued by the NDMA are adapted according to state-specific needs and vulnerabilities. States vulnerable to cyclones, floods, earthquakes, droughts, and landslides develop hazard-specific preparedness and mitigation plans. The SDMAs also coordinate with line departments, scientific agencies, district administrations, and local bodies to strengthen early warning systems, emergency response capacities, and resilience-building initiatives.

3.2.2 State Executive Committee

Each SDMA is assisted by a State Executive Committee (SEC), generally chaired by the Chief Secretary of the state. The SEC coordinates and monitors the implementation of disaster management activities within the state and ensures inter-departmental coordination among various state agencies.

The SEC plays an important role in:

- Monitoring preparedness measures
- Coordinating relief and response operations
- Reviewing the implementation of state disaster management plans
- Facilitating resource mobilization during emergencies.

3.2.3 Urban Disaster Management Authority

The Disaster Management (Amendment) Act, 2025 empowers State governments to establish an Urban Disaster Management Authority (UDMA) for State capitals and cities with municipal corporations (excluding NCT of Delhi and Chandigarh) for dealing with city specific disasters more effectively.

3.3 District-Level Institutional Framework

The district administration plays a crucial role in disaster management because disasters directly affect local communities and infrastructure.

3.3.1 District Disaster Management Authority

The District Disaster Management Authority (DDMA) functions as the primary planning, coordinating, and implementing authority for disaster management at the district level. It is chaired by the District Collector, District Magistrate, or Deputy Commissioner.

The DDMA is responsible for:

- Preparing District Disaster Management Plans
- Coordinating disaster preparedness activities
- Conducting awareness and capacity-building programmes
- Implementing NDMA and SDMA guidelines
- Coordinating relief, rescue, and rehabilitation measures
- Ensuring community preparedness and local participation.

District administrations are central to emergency response operations because they coordinate police, health departments, fire services, public works departments, local bodies, and volunteers during disasters.

The DDMA also plays a key role in:

- Evacuation planning
- Relief distribution
- Damage assessment
- Recovery and reconstruction activities
- Conducting mock drills and simulations

3.4 Local-Level Institutions and Community Participation

The disaster management framework extends to the grassroots level through local governance institutions such as Panchayati Raj Institutions (PRIs), Urban Local Bodies (ULBs), village committees, and community-based organizations.

PRIs and ULBs are increasingly recognized as the “first line of defense” during disasters because local communities are the first responders during emergencies.

Local institutions are involved in:

- Community awareness programmes
- Local preparedness planning
- Identification of the vulnerable population
- Management of shelters and evacuation centres
- Relief coordination
- Local-level risk reduction initiatives.

The NDMP also promotes the preparation of Village Disaster Management Plans (VDMPs) and local-level preparedness mechanisms to strengthen community resilience and decentralized disaster governance.

3.5 Scientific and Technical Institutions

Scientific and technical institutions play an increasingly important role in strengthening disaster preparedness, forecasting, and risk assessment systems in India.

Key institutions include:

- India Meteorological Department (IMD)
- Central Water Commission (CWC)
- Indian Space Research Organisation (ISRO)/ National Remote Sensing Centre (NRSC)
- Geological Survey of India (GSI)
- Forest Survey of India (FSI)
- Defence Geoinformatics Research Establishment (DGRE)

- National Centre for Seismology (NCS)

These institutions support disaster management authorities through:

- Weather forecasting
- Flood forecasting
- Cyclone tracking
- Avalanche monitoring and warning
- Seismic monitoring
- Landslide assessment
- Tsunami warning
- Hazard mapping and satellite-based monitoring.

3.6 Technology Integration and Digital Governance

India's institutional framework for disaster management has evolved significantly through the integration of technology and digital governance mechanisms.

Modern disaster management increasingly utilizes:

- GIS-based hazard mapping
- Real-time monitoring systems
- Satellite-based communication
- Mobile warning applications
- Integrated emergency communication systems
- Disaster databases and digital dashboards.

Digital technologies have improved:

- Early warning dissemination
- Last-mile connectivity
- Inter-agency coordination
- Relief distribution monitoring
- Transparency and accountability.

Advanced technologies such as Geographic Information Systems (GIS), remote sensing, satellite communication, drones, digital mapping, artificial intelligence, and mobile-based warning systems are increasingly being integrated into disaster governance systems.



Chapter 4:

Recommendations of the 16th Finance Commission

The Sixteenth Finance Commission (FC-XVI) has presented a comprehensive framework for financing disaster management in India, emphasizing a transition from a relief-centric approach to a proactive and resilience-oriented disaster management system. The recommendations focus on strengthening institutional financing mechanisms, enhancing preparedness and mitigation, integrating technology, improving accountability, and expanding the scope of disaster risk financing .

The Commission recommended a total allocation of ₹2,04,401 crore for the State Disaster Response Fund (SDRF) and State Disaster Mitigation Fund (SDMF) combined for the award period 2026–27 to 2030–31. The allocation formula is based on 30% weightage to the Disaster Risk Index (DRI) and 70% weightage to the average disaster-related expenditure incurred by states during 2011–12 to 2023–24, excluding COVID-19 years. The Commission further recommended that these funds continue to be divided in the ratio of 80:20 between SDRF and SDMF, respectively. Accordingly, ₹1,63,521 crore has been allocated for SDRF and ₹40,880 crore for SDMF.

A significant recommendation of the Commission is the emphasis on preparedness and mitigation as pre-disaster activities. The Commission clarified that preparedness and capacity building should fall under SDMF and National Disaster Mitigation Fund (NDMF), as these are preventive measures aimed at reducing disaster risks before disasters occur. This reflects the evolving paradigm shift in disaster management financing from response and relief toward risk reduction and resilience-building. The enhanced focus on mitigation ensures that long-term investments such as early warning systems, resilient infrastructure, hazard-resistant public assets, training, and community preparedness receive dedicated financial support rather than being overshadowed by immediate relief and response expenditures.

The Commission also addressed the issue of the accumulation of unspent balances in SDRF accounts of states. It is recommended that if the unspent balance exceeds the total allocation of the previous three years, further releases may be temporarily withheld until the balance falls below the prescribed threshold. This recommendation aims to improve fund

utilization efficiency, prevent unnecessary parking of funds, and ensure need-based financial management and timely utilization of disaster management resources.

At the national level, the Commission recommended a total allocation of ₹79,406 crore for the National Disaster Response Fund (NDRF) and National Disaster Mitigation Fund (NDMF) during the award period. These funds are intended to support relief and rescue, mitigation, recovery and reconstruction, and capacity-building activities. Flexibility has been recommended in sub-allocation among these components to ensure better resource utilization.

The Commission reiterated that disaster management is a shared fiscal responsibility between the Union and State Governments. Accordingly, the existing cost-sharing arrangement of 75:25 for non-North Eastern and Himalayan (non-NEH) States and 90:10 for North Eastern and Himalayan (NEH) States has been retained for SDRF and SDMF. For assistance provided through NDRF and NDMF (excluding relief and response), graded cost-sharing has been recommended for non-NEH states, while NEH states are required to contribute only 10% irrespective of project size.

A major strategic policy shift recommended by the Commission is the expansion of the national list of notified disasters. The Commission observed that the frequency and severity of Heatwaves and Lightning incidents have increased significantly in recent years, resulting in substantial loss of lives, livelihoods, and economic assets. Recognizing the growing climate-related risks and vulnerability of populations, particularly in climate-sensitive regions, the Commission recommended inclusion of heatwaves and Lightning in the national list of notified disasters under the SDRF framework. This recommendation is significant because it enables states to access central assistance and disaster funds for relief, compensation, preparedness, mitigation projects, and awareness programmes specifically related to these emerging climate-induced hazards. At the same time, the Commission recommended continuation of the provision allowing states to utilize up to 10% of SDRF funds for locally notified disasters.

The report strongly emphasizes strengthening institutional capacities for disaster management. It noted that despite increased financial allocations, utilization of funds remains weak due to inadequate institutional and technical capacities at both national and state levels. The Commission observed that while some states have developed integrated digital systems for relief distribution and disaster management, others still rely on extensive manual procedures, causing delays in the disbursement of relief assistance. Consequently, the Commission recommended rapid capacity building in areas such as preparedness, planning, mitigation, recovery, and reconstruction, and advised the NDMA to undertake a comprehensive assessment of institutional capacity gaps and strengthen SDMA.

Technology integration has been identified as a critical component of modern disaster management financing and governance. The report recognizes that technological advancements can facilitate a shift from reactive disaster management to predictive and preventive approaches. The Commission highlighted the importance of technologies such

as artificial intelligence, machine learning, geospatial technologies, remote sensing, satellite imagery, and real-time hazard monitoring systems for forecasting disasters and planning mitigation measures. The report also referred to Mission Mausam, implemented by the Ministry of Earth Sciences, which aims to strengthen forecasting capabilities, real-time data dissemination, and responses to climate-sensitive hazards such as urban flooding, cyclones, and heatwaves. The integration of Mission Mausam reflects the Government of India's emphasis on predictive disaster management using advanced scientific and technological tools.

Another important recommendation pertains to the National Disaster Management Information System (NDMIS). The Commission described NDMIS as a significant initiative for monitoring disaster fund disbursement and recommended transforming it into a comprehensive national disaster management information system capable of capturing real-time transaction-level disaster data. The report recommended mandatory integration of states with the NDMIS portal and proposed that complete data feeding and validation for a financial year by 31 May of the succeeding year should become a necessary condition for states to receive disaster management grants from 2027–28 onward. This recommendation aims to improve transparency, accountability, standardization of disaster reporting, and efficient fund management under the broader Digital India framework.

The report also highlighted concerns regarding accounting and financial management practices in states. It noted deviations from Ministry of Home Affairs norms for booking disaster expenditure, which complicate the assessment and monitoring of disaster-related expenditures. Therefore, the Commission recommended strict adherence to accounting norms and periodic audits by the Comptroller and Auditor General (CAG) of India.

In the area of innovative disaster risk financing mechanisms, the Commission emphasized that government funds alone may not be sufficient to address catastrophic disaster losses. Therefore, it is recommended to explore alternative financing instruments such as insurance-based mechanisms and catastrophe risk transfer systems. The report highlighted the success of the Pradhan Mantri Fasal Bima Yojana (PMFBY) and discussed the Nagaland Disaster Risk Transfer Parametric Insurance Solution as an innovative example of disaster insurance financing in India. Under the parametric insurance model, payouts are triggered automatically based on predefined weather parameters such as rainfall intensity rather than manual damage assessments, thereby ensuring faster and more transparent claim settlement processes.

The Commission also recommended exploring catastrophe bonds and other capital market instruments to transfer high-intensity disaster risks to global investors. Such innovative financing mechanisms can strengthen financial resilience, reduce fiscal stress on governments, and support quicker recovery following major disasters. The Commission further noted that the Department of Financial Services and NDMA are working on the development of single-peril parametric insurance products in line with global best practices.

Overall, the recommendations of the Sixteenth Finance Commission reflect a comprehensive, technology-driven, and forward-looking approach to disaster management financing in India. The report places strong emphasis on preparedness, mitigation, climate resilience, institutional strengthening, accountability, technology integration, and innovative financing mechanisms to create a more sustainable, efficient, and resilient disaster management ecosystem in the country.

4.1 Fund Allocation Summary (2026–2031)

Fund Type	Level	Total Allocation (₹ Crore)	Division Ratio (Response: Mitigation)
SDRMF	State	2,04,401	80% (SDRF): 20% (SDMF)
NDRMF	National	79,406	Flexible sub-allocations

4.2 Allocation Formula

To ensure fairness, the Commission moved beyond population-based metrics, adopting a formula with:

- 30% Weightage: Disaster Risk Index (DRI), which measures actual hazard vulnerability.
- 70% Weightage: Historical average disaster expenditure (2011–2024), ensuring states with chronic disaster issues are not underfunded.



Chapter 5:

Flagship Projects and Initiatives

The NDMA, established under the Disaster Management Act, 2005, is the apex body responsible for formulating policies, plans, and guidelines for disaster management in India. Since its establishment, NDMA has played a crucial role in transforming India's disaster management system from a reactive and relief-centric model to a proactive, technology-driven, and resilience-oriented framework. The authority focuses on prevention, mitigation, preparedness, response, recovery, capacity building, and mainstreaming Disaster Risk Reduction (DRR) into developmental planning processes.

Over the years, NDMA has implemented numerous national-level projects and initiatives aimed at reducing vulnerabilities, strengthening institutional capacities, improving emergency response mechanisms, and enhancing community resilience against both natural and human-induced disasters. These initiatives cover a wide spectrum of hazards, including cyclones, earthquakes, floods, landslides, Glacial Lake Outburst Flood (GLOF), heatwaves, urban disasters, chemical emergencies, biological hazards, and climate-induced risks. Many of these programmes have been developed in collaboration with international organizations, scientific agencies, state governments, academic institutions, and local communities.

The projects and initiatives undertaken by NDMA reflect India's commitment toward building a disaster-resilient nation through infrastructure strengthening, technological innovation, scientific forecasting, community-based disaster preparedness, institutional coordination, and climate adaptation strategies. These initiatives have significantly improved India's preparedness and response capacities and have contributed toward minimizing disaster-related losses and enhancing resilience across vulnerable regions.

5.1 National Cyclone Risk Mitigation Project

The National Cyclone Risk Mitigation Project (NCRMP) is one of the flagship initiatives implemented by the NDMA with financial and technical support from the World Bank. The project was launched to reduce the vulnerability of coastal communities to cyclones and associated hazards such as storm surges, coastal flooding, heavy rainfall, and high-velocity winds.

India's eastern coastline, particularly the Bay of Bengal region, is highly vulnerable to severe cyclonic storms. States such as Odisha, Andhra Pradesh, West Bengal, Tamil Nadu, and Gujarat have historically experienced devastating cyclones causing large-scale human casualties, destruction of infrastructure, agricultural losses, and displacement of populations. Disasters such as the Odisha Super Cyclone (1999), Cyclone Phailin (2013), Cyclone Fani (2019), and Cyclone Amphan (2020) highlighted the need for long-term cyclone risk reduction strategies and resilient coastal infrastructure.

The NCRMP focuses on strengthening structural and non-structural mitigation measures in cyclone-prone states. The project has significantly improved evacuation systems, emergency preparedness, communication infrastructure, and community resilience in vulnerable coastal areas.

The major objectives of the NCRMP project include:

- Construction of multi-purpose cyclone shelters
- Development and strengthening of evacuation routes and roads
- Installation of early warning dissemination systems
- Strengthening of coastal embankments and flood protection infrastructure
- Capacity building and community preparedness
- Creation of cyclone-resilient infrastructure and emergency facilities.

Key Components of NCRMP

- **Cyclone Shelters and Evacuation Infrastructure** - Under NCRMP, numerous multi-purpose cyclone shelters have been constructed in vulnerable coastal districts. These shelters serve as safe evacuation centres during cyclones and also function as community centres during normal periods. Evacuation roads connecting villages to shelters have also been developed to ensure safe and timely movement of populations during emergencies.
- **Early Warning Systems** - The project has strengthened early warning dissemination systems through satellite-based communication technologies, siren systems, digital communication platforms, and village-level warning dissemination mechanisms. These systems ensure timely alerts and improve last-mile connectivity.
- **Community Preparedness and Capacity Building** - NCRMP places strong emphasis on community participation and awareness generation. Training programmes, mock drills, village-level preparedness committees, and awareness campaigns are regularly conducted to improve local preparedness and evacuation capacities.
- **Emergency Operation Centres** - The project also supports the establishment and strengthening of Emergency Operation Centres (EOCs) at state and district levels for improving coordination, communication, and emergency response management.

The NCRMP has significantly reduced cyclone-related casualties in India and is considered one of the most successful disaster risk reduction initiatives in the country.

5.2 School Safety Programme

The School Safety Programme is an important initiative undertaken by the NDMA to strengthen disaster preparedness and resilience in educational institutions across the country. The programme recognizes schools as critical community assets and emphasizes ensuring the safety and protection of children, teachers, and educational infrastructure during disasters.

India's schools are vulnerable to multiple hazards such as earthquakes, floods, cyclones, fires, landslides, lightning, and heatwaves. Past disasters have demonstrated that educational institutions often suffer severe damage during disasters, resulting in casualties, disruption of education, and psychological trauma among children.

The School Safety Programme aims to create a culture of safety and preparedness in educational institutions through infrastructure safety measures, preparedness planning, awareness generation, and capacity development.

Major Components of the Programme include:

- Preparation of School Disaster Management Plans
- Conducting mock drills and evacuation exercises
- Retrofitting vulnerable school buildings
- Teacher and student training programmes
- Awareness campaigns on disaster preparedness and safety measures
- Development of emergency response mechanisms within schools.

The initiative promotes integration of disaster safety education into school activities and encourages active participation of students, teachers, parents, and local authorities in preparedness activities. Children are among the most vulnerable groups during disasters. Therefore, school safety initiatives not only protect educational infrastructure but also help create awareness and preparedness within communities. Trained students often act as important agents of awareness and resilience-building at the household and community levels.

5.3 National Earthquake Risk Mitigation Project

The National Earthquake Risk Mitigation Project focuses on reducing risks associated with earthquakes in vulnerable seismic zones of India. India is highly vulnerable to seismic hazards because approximately 59 percent of the country's landmass falls under Seismic Zones III, IV, and V. The project aims to strengthen institutional capacities, improve compliance with seismic safety standards, and promote earthquake-resistant construction practices across urban and rural areas.

Major Components of the NERMP project include:

- Retrofitting lifeline buildings and critical infrastructure
- Capacity building of engineers, architects, and masons
- Public awareness and community preparedness campaigns
- Development of seismic hazard maps and risk assessments
- Training of Urban Local Bodies and government officials
- Promotion of earthquake-resistant building technologies.

The initiative focuses on minimizing structural vulnerabilities and improving preparedness capacities in earthquake-prone regions such as the Himalayan belt, Northeast India, Gujarat, and parts of northern India.

5.4 National Landslide Risk Mitigation Programme (NLRMP)

The National Landslide Risk Mitigation Programme (NLRMP) is a comprehensive initiative launched by the National Disaster Management Authority (NDMA) to address the increasing threat of landslides in India's mountainous and hilly regions, particularly the Himalayas, North-Eastern states, and the Western Ghats. The programme adopts a holistic and science-driven approach for mainstreaming landslide risk reduction and mitigation through coordinated action among central agencies, state governments, technical institutions, and local communities. Community participation is considered essential for successful implementation and long-term resilience building.

The major objectives of the NLRMP include:

- Prevent loss of life due to landslide events
- Reduce economic losses caused by landslides
- Strengthen last-mile early warning systems
- Enhance scientific and technical capabilities in landslide risk reduction and mitigation
- Empower local communities as partners in mitigation and preparedness

Key Components of NLRMP:

- Landslide Risk and Vulnerability Assessment
- Landslide Monitoring and Early Warning System
- Slope Stabilization
- Awareness generation and capacity building

5.5 National Glacial Lake Outburst Flood Risk Mitigation Programme (NGRMP)

The National Glacial Lake Outburst Flood Risk Mitigation Programme (NGRMP) is a

national-level programme formulated by NDMA to reduce risks associated with Glacial Lake Outburst Floods (GLOFs) in the Indian Himalayan Region. Climate change, glacier retreat, and the rapid expansion of glacial lakes have significantly increased the vulnerability of Himalayan states such as Uttarakhand, Himachal Pradesh, Sikkim, Arunachal Pradesh, Ladakh, and Jammu & Kashmir to catastrophic GLOF events. The programme also promotes site-specific mitigation interventions such as controlled drainage, outlet regulation, slope stabilization, and reinforcement of unstable moraine dams. In addition, it emphasizes community awareness, contingency planning, research, and integration of indigenous knowledge with modern scientific approaches.

The major objectives of the NGRMP include:

- Prevent loss of life and reduce economic losses and damage to critical infrastructure due to GLOF and similar events
- Strengthen the early warning systems and monitoring capacities based on last-mile connectivity
- Strengthen scientific and technical capacities in GLOF risk reduction and mitigation at local levels through strengthening local level institutions and communities
- Use of indigenous knowledge and scientific cutting edge mitigation measures to reduce and mitigate GLOF risk

Key Components of NLRMP:

- GLOF Hazard and Risk Assessment
- Glacial Lake Monitoring and Early Warning Systems
- GLOF Mitigation Measures (Site-specific interventions combining technical expertise and community involvement)
- Awareness generation and capacity building

5.6 National Disaster Communication Network

The National Disaster Communication Network (NDCN) is an important initiative aimed at strengthening communication systems during disasters and emergencies.

Communication systems often fail during major disasters because of infrastructure damage, power failures, and network disruptions. The NDCN ensures uninterrupted communication among disaster management authorities, emergency responders, and government agencies during emergencies.

NDCN network supports:

- Satellite-based communication systems
- Emergency communication infrastructure
- Connectivity for Emergency Operation Centres

- Inter-agency communication and coordination
- Real-time information sharing mechanisms.

The project is especially important in remote, mountainous, and coastal regions where conventional communication systems may fail during disasters.

5.7 Aapda Mitra Scheme

The Aapda Mitra Scheme is a community volunteer programme launched by the NDMA to train local volunteers in disaster preparedness and emergency response. The scheme recognizes that local communities are the first responders during disasters and aims to create a cadre of trained volunteers capable of supporting local authorities during emergencies.

The programme focuses on:

- Search and rescue operations
- First aid and emergency medical support
- Evacuation procedures
- Relief coordination
- Community awareness generation
- Basic disaster response skills.

The scheme promotes community ownership and localized preparedness mechanisms, particularly in disaster-prone districts vulnerable to floods, cyclones, earthquakes, and landslides.

Trained volunteers assist in:

- Early warning dissemination
- Evacuation support
- Rescue assistance
- Relief distribution
- Community awareness activities.

5.8 Heatwave Action and Mitigation Initiatives

With increasing impacts of climate change, heatwaves have emerged as a major hazard in India. The NDMA has developed comprehensive Heatwave Management Guidelines and promoted Heat Action Plans across states and cities.

The initiatives focus on:

- Early warning dissemination
- Public awareness campaigns

- Protection of vulnerable populations
- Health preparedness measures
- Inter-departmental coordination
- Heat-resilient urban planning.

NDMA collaborates closely with the India Meteorological Department and state governments to strengthen forecasting systems and preparedness capacities.

5.9 Flood Risk Mitigation and Urban Flooding Initiatives

NDMA has undertaken several initiatives related to flood management and urban flood mitigation. These initiatives emphasize integrated flood management, improved drainage systems, flood forecasting, floodplain zoning, and urban resilience planning.

The initiatives focus on:

- Flood forecasting and warning systems
- Urban flood management plans
- Drainage improvement measures
- Floodplain zoning regulations
- Community preparedness and awareness
- Climate-resilient urban planning.

Rapid urbanization and encroachment of natural drainage systems have increased urban flooding risks in cities such as Mumbai, Chennai, Bengaluru, Hyderabad, and Delhi.

5.10 National Disaster Management Information System

The National Disaster Management Information System (NDMIS) is a digital governance platform developed to strengthen disaster-related data management, reporting, monitoring, and coordination mechanisms.

The system supports:

- Real-time disaster data management
- Monitoring of fund utilization
- Disaster reporting and analysis
- Inter-state coordination
- Monitoring SDRF and NDRF allocations

The NDMIS reflects India's increasing focus on technology-enabled disaster governance and data-driven decision-making processes.

5.11 Mock Exercises

The NDMA regularly conducts mock exercises, simulation exercises, and capacity-building programmes across states and sectors to strengthen preparedness and improve inter-agency coordination.

These exercises include:

- Earthquake preparedness
- Chemical and industrial disasters
- Flood and cyclone response
- Nuclear and radiological emergencies
- Urban search and rescue operations
- Hospital and school safety preparedness.

The programmes involve coordination among ministries, armed forces, NDRF, SDRF, police, fire services, health departments, local authorities, and community volunteers.

Capacity-building programmes improve:

- Institutional preparedness
- Emergency response coordination
- Decision-making efficiency
- Community resilience
- Technical and operational skills.

These exercises also help identify operational gaps and improve emergency response planning.



Chapter 6:

Disaster Governance in India: Administrative Role of IAS Officers

Disaster Management (DM) in India has evolved significantly over the last two decades from a reactive and relief-oriented administrative function to a proactive, integrated, and resilience-based governance framework emphasizing prevention, mitigation, preparedness, response, recovery, rehabilitation, and sustainable development. Within this evolving framework, officers of the Indian Administrative Service (IAS) occupy a central and strategic position in disaster governance at national, state, district, and local levels. IAS officers function as policy implementers, coordinators, crisis managers, planners, and leaders responsible for ensuring effective disaster preparedness, response coordination, rehabilitation, and long-term resilience-building across sectors and administrative systems.

The responsibilities of IAS officers in disaster management derive from multiple legal, policy, and institutional frameworks, including the Disaster Management Act, 2005 and its amendment in 2025,, the National Policy on Disaster Management, the National Disaster Management Plan (NDMP) (2019), and international frameworks such as the Sendai Framework for Disaster Risk Reduction (2015-2030). These frameworks collectively emphasize decentralized governance, risk-informed planning, inter-sectoral coordination, community participation, climate resilience, and technology-enabled disaster management systems.

Traditionally, administrators were primarily engaged in post-disaster relief distribution and law-and-order management during emergencies. However, the contemporary disaster management framework has transformed the role of IAS officers from “crisis managers” to “risk managers,” requiring them to focus on long-term disaster risk reduction, climate adaptation, resilient development, institutional strengthening, and sustainable governance. Today, IAS officers are expected not only to manage emergencies effectively but also to anticipate risks, reduce vulnerabilities, strengthen preparedness systems, promote resilient infrastructure, and integrate disaster risk reduction into developmental planning.

6.1 Policy Coordination and Disaster Governance

At the national level, senior IAS officers serve in institutions such as the Ministry of Home Affairs, NDMA, the National Executive Committee (NEC), and various ministries

responsible for disaster governance and emergency coordination.

They are responsible for:

- Implementation of disaster management policies and plans
- Coordination among ministries and departments
- Monitoring preparedness and mitigation activities
- Ensuring compliance with NDMA guidelines
- Mobilization and allocation of resources during disasters
- Coordination with scientific and technical agencies
- Monitoring implementation of national and state disaster management plans.

IAS officers ensure inter-ministerial coordination among departments such as health, agriculture, transport, urban development, rural development, environment, water resources, telecommunications, defence, and energy during disaster situations. At the state level, IAS officers support the functioning of SDMA, State Executive Committees, and state-level emergency response systems. They facilitate policy implementation, coordination, and integration of disaster risk reduction measures into state development programmes and sectoral policies.

6.2 Role of District Magistrate / District Collector / Deputy Commissioner

The most important and operationally significant role of IAS officers in disaster management is performed at the district level through the office of the District Magistrate, District Collector, or Deputy Commissioner. Under the Disaster Management Act, the District Collector functions as the Chairperson of the District Disaster Management Authority (DDMA) and serves as the focal point for disaster governance at the district level. The District Collector is responsible for planning, coordination, implementation, supervision, and emergency response management within the district. Since disasters directly impact local communities, the district administration plays the most crucial role in disaster preparedness and emergency management.

Major Responsibilities of the District Collector include:

- Preparation and implementation of District Disaster Management Plans (DDMPs)
- Conducting hazard, vulnerability, and risk assessments
- Coordination among line departments and local authorities
- Organizing mock drills, simulations, and preparedness exercises
- Ensuring evacuation planning and emergency shelter management
- Distribution of relief, compensation, and humanitarian assistance
- Coordination with SDRF, NDRF, police, fire services, health departments, and armed forces

- Monitoring rehabilitation and reconstruction activities
- Ensuring restoration of essential services and infrastructure.

The District Collector possesses extensive administrative powers during emergencies and is empowered to issue directions, requisition resources, regulate movement, and undertake emergency measures for the protection of life and property.

6.3 Statutory Powers under the DM Act

The Disaster Management Act grants significant authority to District Magistrates under various provisions:

- Section 30 mandates the preparation of District Disaster Management Plans and the coordination of disaster management activities within the district.
- Section 34 empowers the District Magistrate to undertake extraordinary emergency measures, including:
 - o Controlling traffic and movement
 - o Evacuation of populations
 - o Removal of debris
 - o Requisitioning resources and services
 - o Establishment of emergency shelters
 - o Coordination of rescue operations.

These provisions make the District Collector the central authority for emergency management at the local level.

6.4 Incident Response and Emergency Coordination

During disasters, IAS officers function as crisis managers and emergency coordinators responsible for ensuring rapid, organized, and effective response operations.

Their responsibilities during emergencies include:

- Coordinating search and rescue operations
- Establishing relief camps and emergency shelters
- Arranging food, drinking water, sanitation, and medical assistance
- Restoring transportation, communication, and electricity services
- Maintaining law and order
- Managing public communication and media coordination
- Monitoring relief distribution and humanitarian assistance.

IAS officers also ensure coordination between:

- Government departments
- Armed forces
- NDRF and SDRF units
- Police and fire services
- NGOs and civil society organizations
- Community institutions and volunteers.

The ability of IAS officers to coordinate multiple agencies under stressful conditions is critical for minimizing casualties and ensuring efficient disaster response.

6.5 Role under the National Policy on Disaster Management

The National Policy on Disaster Management (NPDM) marked a major shift in India's disaster governance system by emphasizing prevention, mitigation, preparedness, and resilience-building rather than merely post-disaster relief administration. Under the NPDM framework, IAS officers are expected to mainstream DRR into governance and developmental planning processes.

- **Mainstreaming Disaster Risk Reduction into Development** - IAS officers are responsible for ensuring that development projects incorporate disaster resilience and risk-sensitive planning measures. They supervise the integration of DRR principles into:
 - o Infrastructure projects
 - o Urban planning
 - o Housing schemes
 - o Rural development programmes
 - o Smart city initiatives
 - o Environmental management plans.

This approach ensures that developmental activities do not create new vulnerabilities and that infrastructure remains resilient against disasters.

- **Community Participation and Inclusive Governance** - The NPDM emphasizes participatory and inclusive disaster governance. IAS officers are expected to:
 - o Promote community participation
 - o Strengthen local preparedness mechanisms
 - o Conduct awareness and training programmes
 - o Ensure inclusion of vulnerable populations. Special attention is given to:

- Women
- Children
- Elderly persons
- Persons with disabilities
- Marginalized and economically weaker groups.

Administrators are responsible for ensuring equitable access to relief, rehabilitation, and recovery support during disasters.

6.6 Role under the National Disaster Management Plan

The National Disaster Management Plan (NDMP) aligns India's disaster management priorities with the Sendai Framework for Disaster Risk Reduction and emphasizes preparedness, resilience, climate adaptation, and decentralized governance.

IAS officers play a central role in implementing NDMP priorities through:

- Multi-sectoral coordination
- Risk-informed development planning
- Capacity development and training
- Strengthening early warning systems
- Community-based disaster risk reduction.

Incident Response System (IRS) - Under the NDMP, IAS officers function within the Incident Response System (IRS), which establishes a unified command structure for emergency response. The District Magistrate acts as the Responsible Officer for:

- Designating Incident Commanders
- Mobilizing resources
- Coordinating emergency operations
- Supervising response activities

IAS officers are expected to integrate climate resilience and sustainability principles into local planning and governance mechanisms. The National Disaster Management Plan emphasizes emerging challenges such as:

- Climate change adaptation
- Urban flood management
- Heatwave preparedness
- Coastal resilience
- Technological hazards.

6.7 Role under the Sendai Framework for Disaster Risk Reduction

The Sendai Framework for Disaster Risk Reduction outlines four major priorities for reducing disaster risks globally. IAS officers play a key role in operationalizing these priorities in India.

(A) Understanding Disaster Risk:- Administrators are responsible for:

- Hazard mapping and vulnerability assessments
- Data collection and disaster databases
- GIS-based risk analysis
- Evidence-based planning and decision-making.

(B) Strengthening Disaster Risk Governance:- IAS officers strengthen governance mechanisms by:

- Ensuring institutional coordination
- Enforcing safety regulations and building codes
- Supervising the implementation of policies and plans
- Facilitating stakeholder participation.

(C) Investing in Disaster Resilience:- Administrators supervise:

- Disaster-resilient infrastructure projects
- Climate adaptation measures
- Flood control and mitigation projects
- Integration of DRR into development schemes.

(D) Enhancing Preparedness and “Build Back Better”:- The Sendai Framework emphasizes the “Build Back Better” approach during recovery and reconstruction. IAS officers are responsible for:

- Damage and loss assessments
- Rehabilitation planning
- Reconstruction of infrastructure
- Livelihood restoration
- Ensuring resilient reconstruction practices.

The objective is not merely to restore pre-disaster conditions but to reduce future vulnerabilities and improve resilience.



Chapter 7:

Functions and Responsibilities of DM/DC in Disaster Management

The Deputy Collector/Deputy Commissioner/District Magistrate is the central authority for disaster management at the district level. Their responsibilities are defined mainly under the Disaster Management Act, 2005, and guided by the NDMA and SDMAs. Their role spans from preparedness and mitigation before disaster, emergency response during disaster, and recovery and rehabilitation after disaster. They ensure coordination among government agencies, effective use of resources, protection of lives and property, and restoration of normalcy in affected districts.

The DM/DC acts as the Chairperson or key executive authority of the DDMA and is responsible for disaster management in all three phases:

7.1 Pre-Disaster Phase (Preparedness, Prevention, and Mitigation)

This phase focuses on reducing disaster risks and preparing the district before a disaster occurs.

7.1.1 Planning and Policy Implementation

- ✓ Prepare and regularly update the District Disaster Management Plan (DDMP).
- ✓ Identify hazard-prone and vulnerable areas in the district. Some of the common hazards are listed below:
 - o floods
 - o earthquakes
 - o droughts
 - o cyclones
 - o landslides
 - o industrial accidents

- o heat waves
- o epidemics
- ✓ Develop departmental contingency plans.
- ✓ Ensure implementation of state and national disaster management policies.
- ✓ Integrate disaster risk reduction into district development plans.

What the DM/DC should pay attention to

- Plans should not remain only on paper; they must be practical and tested.
- Ensure every department clearly knows its responsibilities.
- Pay attention to high-risk villages, urban slums, riverbanks, coastal areas, forests, and industrial zones.
- Maintain updated contact lists and communication systems.
- Check whether emergency stocks and rescue equipment actually exist and function.

7.1.2 Risk Assessment and Mitigation

- ✓ Conduct vulnerability and risk mapping for the different hazards exists in the district.
- ✓ Promote the construction of disaster-resistant infrastructure.
- ✓ Ensure enforcement of building codes and safety regulations.
- ✓ Identify shelters, evacuation routes, and safe zones.
- ✓ Remove encroachments from vulnerable areas.

7.1.3 Preparedness Measures

- ✓ Organize mock drills and simulation exercises.
- ✓ Maintain emergency operation centres and communication systems.
- ✓ Strengthen embankments, drainage systems, shelters, and public infrastructure.
- ✓ Ensure availability of emergency resources and stockpiling of essential supplies:
 - o food grains
 - o medicines
 - o drinking water
 - o rescue equipment
 - o fuel
- ✓ Facilitate training of district officials, police, fire services, health workers, and volunteers.

What the DM/DC should pay attention to

- Weak infrastructure often causes secondary disasters.

- Illegal construction in flood plains or unstable hillsides must be monitored.
- Hospitals, schools, bridges, and control rooms must remain functional during disasters.
- Critical infrastructure should have backup power and communication systems.

7.1.4 Public Awareness and Capacity Building

- ✓ Conduct awareness campaigns in schools, villages, and urban areas.
- ✓ Educate people regarding evacuation, first aid, and emergency response.
- ✓ Coordinate with NGOs, community groups, and local bodies.

What the DM/DC should pay attention to

- Coordination failures are common during disasters.
- Clearly define the chain of command.
- Build trust with local communities before disasters occur.
- Maintain updated databases of volunteers and resources.

7.1.5 Early Warning and Coordination

- ✓ Establish coordination with:
 - o India Meteorological Department
 - o Central Water Commission
 - o National Disaster Response Force
 - o State Disaster Response Force
 - o Irrigation departments
 - o Health departments
 - o Police and armed forces
 - o Technical departments
- ✓ Facilitate the dissemination of early warning information quickly to the public.

What the DM/DC should pay attention to

- Warnings must reach the “last mile” population.
- Avoid delay in evacuation decisions.
- Rumours and misinformation can create panic.
- Communication should be multilingual and simple.
- Ensure warnings reach:
 - o remote villages

- o persons with disabilities
- o migrant workers
- o elderly persons

7.2 During Disaster Phase (Response and Emergency Management)

This phase includes immediate actions taken during and immediately after the disaster.

7.2.1 Command and Coordination

- ✓ Act as the overall incident commander at the district level.
- ✓ Activate the District Emergency Operation Centre.
- ✓ Coordinate all departments and response agencies.
- ✓ Maintain law and order.

What the DM/DC should pay attention to

- Decision-making must be fast and evidence-based.
- Avoid confusion between departments.
- Ensure continuous communication with state authorities.
- Monitor ground realities personally whenever possible.

7.2.2 Rescue and Evacuation

- ✓ Organize the evacuation of affected populations.
- ✓ Deploy rescue teams, police, fire services, and medical teams.
- ✓ Request assistance from state or national agencies if required.

What the DM/DC should pay attention to

- Evacuation delays can increase casualties.
- Relief camps should ensure:
 - o clean water
 - o sanitation
 - o food quality
 - o women's safety
 - o child protection
- Avoid overcrowding in camps.
- Give priority to vulnerable groups.

7.2.3 Relief Operations

- ✓ Arrange:
 - o temporary shelters
 - o food
 - o safe drinking water
 - o sanitation
 - o clothing
 - o medicines
- ✓ Ensure special care for:
 - o children
 - o women
 - o elderly persons
 - o persons with disabilities

7.2.4 Medical and Public Health Measures

- ✓ Prevent disease outbreaks and epidemics.
- ✓ Arrange emergency medical care and ambulances.
- ✓ Ensure proper disposal of dead bodies and animal carcasses safely.

What the DM/DC should pay attention to

- Disease outbreaks often follow floods and cyclones.
- Monitor drinking water quality continuously.
- Mental health support may be needed for survivors.
- Ensure adequate medicines, ambulances, and blood supply.

7.2.5 Information Management

- ✓ Disseminate accurate information to the public and media.
- ✓ Monitor the disaster situation continuously.
- ✓ Submit reports to the state government and disaster authorities.
- ✓ Counter rumours and misinformation.
- ✓ Maintain transparency.

What the DM/DC should pay attention to

- False information can create panic and violence.
- Regular press briefings build public trust.
- Social media monitoring is essential.
- Avoid hiding information from the public.

7.2.6 Resource Mobilization

- ✓ Utilize district disaster response funds.
- ✓ Requisition for vehicles, equipment, buildings, or manpower when necessary under legal provisions.
- ✓ Coordinate external assistance.
- ✓ Mobilize district resources.

What the DM/DC should pay attention to

- Prevent misuse or diversion of relief materials.
- Maintain proper records and accountability.
- Ensure equitable distribution of aid.
- Corruption during disasters severely damages public trust.

7.3 Post-Disaster Phase (Recovery, Rehabilitation, and Reconstruction)

This phase focuses on restoring normal life and reducing future vulnerabilities.

7.3.1 Damage and Needs Assessment

- ✓ Conduct surveys of:
 - o loss of life
 - o property damage
 - o crop losses
 - o infrastructure damage
 - o economic losses
- ✓ Prepare detailed assessment reports.

What the DM/DC should pay attention to

- Assessments must be quick but accurate.
- Avoid political influence or manipulation.
- Ensure inclusion of marginalized communities.
- Use technology such as GIS, drones, and mobile surveys where possible.

7.3.2 Relief Distribution and Compensation

- ✓ Distribute compensation and financial assistance to victims as per guidelines.
- ✓ Ensure transparent and fair distribution of relief materials.
- ✓ Implement and monitor rehabilitation schemes.

What the DM/DC should pay attention to

- Delayed compensation increases public distress.
- Ensure transparency and grievance redressal.
- Prevent duplication and fake claims.
- Monitor whether aid actually reaches beneficiaries.

7.3.3 Restoration of Essential Services

- ✓ Restore:
 - o electricity
 - o roads
 - o telecommunications
 - o water supply
 - o schools
 - o hospitals

7.3.4 Rehabilitation and Reconstruction

- ✓ Rehabilitate displaced persons.
- ✓ Support farmers, labourers, and small businesses.
- ✓ Reconstruct damaged houses and public infrastructure.
- ✓ Promote “Build Back Better” principles for resilience.

What the DM/DC should pay attention to

- Do not rebuild unsafe structures in hazard-prone areas.
- Implement employment and livelihood support programmes. Livelihood restoration is as important as infrastructure repair.
- Community participation improves recovery success.

7.3.5 Psychological and Social Recovery

- ✓ Support the rehabilitation of affected families and communities.
- ✓ Coordinate social welfare measures.

What the DM/DC should pay attention to

- Trauma, displacement, and social conflict may continue long after a disaster.
- Pay special attention to:
 - o orphaned children
 - o widows
 - o elderly persons
 - o disabled persons
 - o migrant labourers

7.3.6 Review and Future Preparedness

- ✓ Analyse lessons learned from the disaster.
- ✓ Update disaster management plans accordingly.
- ✓ Improve district preparedness systems.

7.4 Additional Powers and Functions of DM/DC in Disaster Management

Under the Disaster Management Act, 2005, the District Magistrate may:

- ✓ Issue emergency orders.
- ✓ Control movement in affected areas.
- ✓ Coordinate with the armed forces.
- ✓ Requisition resources and premises.
- ✓ Direct local authorities and departments.
- ✓ Enforce evacuation and safety measures.

7.5 Institutional Role of the District Magistrate

The DM/DC coordinates with:

- ✓ District Disaster Management Authority (DDMA)
- ✓ Police Department
- ✓ Health Department
- ✓ Municipal bodies and Panchayats
- ✓ State Disaster Management Authority (SDMA)
- ✓ National Disaster Management Authority
- ✓ National Disaster Response Force
- ✓ NGOs and community organizations

Success in disaster management depends not only on formal authority but also on:

- preparedness,
- coordination,
- rapid decision-making,
- transparency,
- empathy,
- protection of vulnerable populations, and long-term recovery planning.

A proactive DM/DC can significantly reduce loss of life, suffering, and economic damage during disasters.



Chapter 8:

Case Vignettes

Decision-Analysis Modules

The three vignettes presented in this chapter are drawn from documented Indian disasters. They are structured as decision-analysis modules-presenting the operational context, the administrative decisions executed or the systemic bottlenecks encountered, and the key lesson for District Magistrates. Participants are encouraged to identify analogous situations in their training districts.

MODULE 1: CYCLONE FANI - ODISHA, MAY 2019

Parameter	Detail
Event Classification	Extremely Severe Cyclonic Storm (ESCS), Category: ESCS
Landfall	Near Puri, Odisha, 3 May 2019, ~0800 hrs
Wind Speed at Landfall	Sustained ~175 km/h; gusts up to 240 km/h
IMD Lead Time	First track forecast issued seven days before landfall; narrowing track predictions with 24-hour specificity
Population Exposed	Over 10 million in the cyclone's direct path across four districts

Administrative Decisions Executed

- District Collectors treated the 24-hour-out meteorological forecast as actionable rather than waiting for late-stage confirmation, issuing evacuation orders immediately.
- A massive pre-emptive evacuation was authorised and executed: 1.2 million people moved into 4,000 secure shelters within a 24-hour window.
- 45,000 village-level volunteers and Aapda Mitra members were mobilised under direct Panchayat coordination to manage shelter logistics.
- Multi-purpose cyclone shelters built under the National Cyclone Risk Mitigation Project (NCRMP) were activated using pre-existing operating protocols.

Operational Outcome

Total direct casualties were limited to approximately 64 individuals out of an exposed population of over 10 million, a ratio widely cited as a landmark achievement in mass evacuation management in the developing world.

Key Lesson for District Magistrates

MODULE 1 LESSON

Preparedness is built years before a disaster hits. The Fani outcome was determined by the existence of NCRMP shelters constructed in preceding years, trained volunteer networks, and pre-season evacuation rehearsals—not by individual, last-minute decisions. A severe incoming storm with 24 hours' notice is a reason to execute evacuations, not a reason to delay pending final confirmation. Perfect evacuation decisions are inherently forward-leaning; conservative decisions under uncertainty cost lives.

MODULE 2: CHENNAI FLOODS - TAMIL NADU, DECEMBER 2015

Parameter	Detail
Trigger Event	Northeast Monsoon extreme rainfall: ~1,200 mm in November, 494 mm on 1 December 2015
Fatalities	Approximately 280 direct fatalities
Economic Loss	Estimated Rs. 20,000–22,000 crore; major infrastructure disruption across city
Infrastructure Disrupted	Chennai International Airport (shut 13 days), major road network, IT sector

Systemic Bottlenecks Encountered

- Multiple overlapping entities-the Municipal Corporation, Public Works Department, SDMA, and three adjacent district administrations-operated without pre-established coordination protocols at the field level.
- Decades of unplanned urban expansion had encroached directly upon the natural floodplain of the Adyar River and transformed the Pallikaranai marshland, which historically absorbed monsoon overflow, into residential and IT zones.
- The emergency release of water from the upstream Chembarambakkam reservoir was executed with insufficient coordination with downstream evacuation teams, causing sudden inundation of residential areas.
- The absence of a pre-agreed reservoir release and downstream evacuation protocol is now a standard negative lesson in urban flood management across India.

Key Lesson for District Magistrates

MODULE 2 LESSON

Urban flooding is usually the consequence of long-term development decisions-drainage capacity, wetland protection, floodplain zoning-and cannot be fixed during the disaster itself. The District Magistrate's primary contribution to urban flood resilience occurs upstream, through strict enforcement of land-use zoning laws during routine posting. Reservoir release protocols must be formalised person-to-person with irrigation engineers well before the storm season, not during the emergency.

MODULE 3: SIKKIM GLACIAL LAKE OUTBURST FLOOD - OCTOBER 2023

Parameter	Detail
Event	South Lhonak Lake glacial lake outburst flood (GLOF)
Date and Time	Night of 3–4 October 2023, approximately 0100 hrs
Volume Released	Estimated 50 million cubic metres
Downstream Impact	200 km; Chungthang dam (1,200 MW Teesta-III project) destroyed; NH-10 severed
Fatalities	Over 100, including military personnel stationed downstream

Systemic Bottlenecks Encountered

- The hazard moved exceptionally fast, compressing the warning-to-impact interval to minutes to a few hours depending on location downstream. High-altitude mountain geography made large-scale manual evacuation logistically impossible.
- A major critical infrastructure project (the 1,200 MW Teesta-III dam) sat directly in the path of a known glacial hazard without sufficient resilience considerations having been incorporated during its initial sanction phase.
- Physical connectivity destruction in rugged terrain immediately isolated large populations, creating an acute post-disaster logistics challenge with no road-based access to many affected areas for several days.
- The GLOF occurred at a known high-risk lake; automated sensor-triggered warning systems had been discussed but not yet installed at the time of the breach.

Key Lesson for District Magistrates

MODULE 3 LESSON

Slow-onset and fast-onset hazards require completely different preparedness postures. Fast-onset GLOF events compress the decision window to near-zero; the focus must be on early warning automation-sensor-triggered automated cell broadcasts and siren networks-rather than human-mediated evacuation orders. For hill districts: pre-position heavy road equipment along alternate routes and formalise helicopter coordination protocols with the Air Force before the monsoon season begins. GLOFs and cloudbursts require near-zero latency in the warning-to-action chain.

MODULE 4

UTTARAKHAND CLOUDBURST EVENTS (2024–25)

Repeated cloudburst events across Chamoli, Rudraprayag, Uttarkashi, and Pithoragarh districts in 2024–25 demonstrated the compounding effect of multiple simultaneous small-to-medium events overwhelming district-level response capacity. Key lessons include the critical importance of pre-monsoon road condition mapping, pre-positioned Bailey bridges, and mutual aid agreements with adjacent districts for resource sharing when multiple blocks are simultaneously cut off.

Parameter	Detail
Event Classification	Repeated Cloudburst and Localised Flash Flood Events
Affected Districts	Chamoli, Rudraprayag, Uttarkashi, and Pithoragarh, Uttarakhand
Time Period	Monsoon Seasons, 2024–25
Nature of Impact	Multiple simultaneous small-to-medium intensity cloudburst incidents triggering flash floods, landslides, road washouts, and bridge collapses
Operational Challenge	Several blocks and remote habitations became inaccessible simultaneously, stretching district response capacity beyond planned thresholds
Infrastructure Disruptions	Repeated road closures on hill routes, disruption of communication systems, isolation of villages, and delays in relief supply movement
Key Vulnerabilities Exposed	Dependence on single-road connectivity, inadequate pre-positioning of restoration assets, and limited surge resource capacity at district level

Systemic Bottlenecks Encountered

- Simultaneous cloudburst incidents overwhelmed district response capacity.
- Single-road connectivity failures led to isolation of multiple blocks and villages.
- Delays in road restoration due to limited pre-positioned machinery and Bailey bridges.
- Communication disruptions affected coordination and situational awareness.
- Relief supply movement was hindered by recurring landslides and blocked routes.
- Limited decentralised stockpiling increased dependence on district headquarters.
- Weak mutual aid arrangements delayed inter-district resource sharing.
- Coordination challenges emerged among SDRF, BRO, PWD, police, and district administration.
- Rapid damage assessment was difficult in inaccessible mountainous terrain.
- Inadequate integration of risk reduction measures in hill infrastructure and land-use planning.

Key Lesson for District Magistrates

MODULE 4 LESSON

In mountainous districts, disaster response capacity is often determined by connectivity rather than the magnitude of rainfall alone. Multiple moderate incidents occurring simultaneously can overwhelm district administration faster than a single large disaster. Preparedness therefore requires advance mapping of vulnerable road networks, pre-positioning of restoration assets such as Bailey bridges and heavy machinery, and formal mutual aid agreements with neighbouring districts. District Magistrates must plan for scenarios where several blocks become inaccessible at the same time and where external assistance may itself face movement constraints. In hill disasters, logistical preparedness before the monsoon is often the decisive factor between temporary disruption and prolonged isolation.

These events also demonstrated the value of community-based early warning through trained Aapda Mitra volunteers with handheld VHF sets who can relay ground observations to the EOC when formal sensor networks are unavailable.





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