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Resilient India - Disaster Free India

Training Programme on

Pre-Monsoon Preparedness in Maharashtra

Jointly Organised by

National Institute of Disaster Management (NIDM)

Maharashtra State Disaster Management Authority (MSDMA)

Yashwantrao Chavan Academy of Development Administration (YASHADA)

Date	6 th – 8 th May, 2026
Venue	YASHADA, Pune, Maharashtra



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1. Introduction

Southwest monsoon season arrive every year between June and September, bringing life-sustaining rainfall to Maharashtra, and also unleashes floods, landslides, dam overflows, and urban inundation that claim lives, destroy livelihoods, and overwhelm governance systems. Maharashtra's disaster risk profile is both complex and multidimensional. The state encompasses the Konkan coastal belt, the Western Ghats, the Deccan Plateau, and the semi-arid tracts of Marathwada and Vidarbha; each with distinct hydro-meteorological characteristics, vulnerability profiles, and governance challenges. Rapid urbanisation, unplanned land use, encroachment of floodplains, and intensifying climate variability are compounding existing risks. Every monsoon season tests the resilience of communities, the responsiveness of administration, and the effectiveness of disaster management systems across the state.

While advances in meteorological science, flood forecasting, and early warning technology have significantly improved our capacity to anticipate monsoon-related hazards, the translation of this knowledge into timely, coordinated, and effective preparedness action at the state, district, and local levels remains a formidable challenge. The gap between scientific warning and administrative response, between national policy and field implementation, and between institutional knowledge and community awareness continues to cost lives and resources each year.

It is in this context that the National Institute of Disaster Management (NIDM), Maharashtra State Disaster Management Authority (MH-SDMA), and YASHADA have jointly planned a Training Programme on "Pre-Monsoon Preparedness in Maharashtra". The event is scheduled from **6th to 8th May 2026, at YASHADA, Pune**. The programme will focus on Understanding of Rainfall patterns, flood vulnerabilities, early warning systems, coordination mechanisms and preparedness planning at state, district and urban levels. This programme is designed to build the capacities of key government officials, disaster managers, and emergency response personnel so that they are better equipped to plan, coordinate, and act decisively before, during, and after the monsoon season.

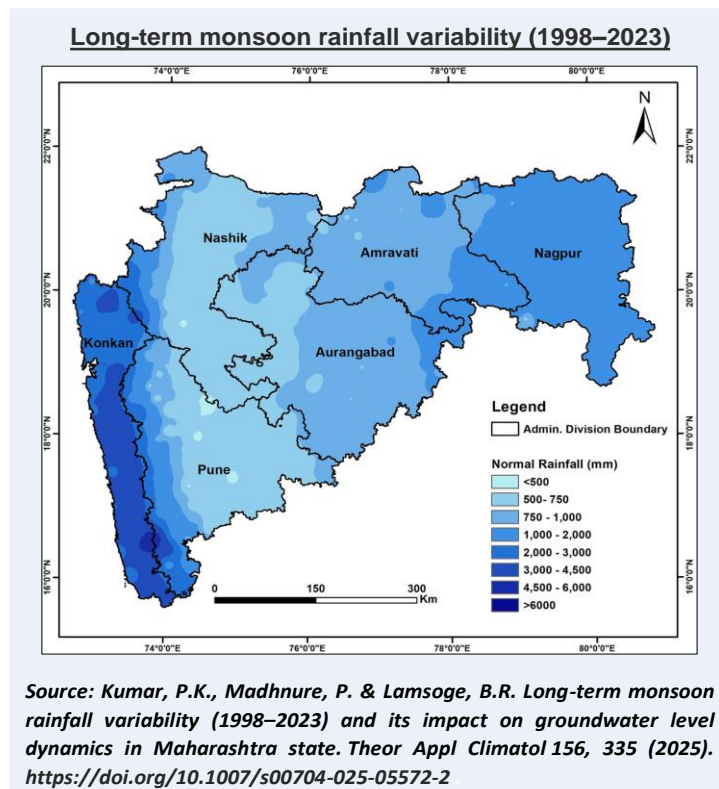
2. Monsoon Season in Maharashtra: Patterns, Impacts and Risk

2.1 Hydro-Meteorological Context

Maharashtra receives the majority of its annual rainfall from the Southwest Monsoon, which typically establishes itself over the Konkan coast in early June and progressively advances inland, withdrawing by late September or early October. The state's average annual rainfall is approximately 1,178 mm, though this figure masks a dramatic spatial gradient: the Konkan

coast and the windward slopes of the Western Ghats receive between 2,000 mm and 6,000 mm of rainfall annually, while the rain-shadow regions of Marathwada and eastern Vidarbha may receive as little as 400–600 mm in a year.

This uneven rainfall distribution is not just a meteorological condition but the fundamental driver of Maharashtra's recurring disaster risk. Extreme rainfall events, cloud bursts, and intense spell concentrations over short durations in geographically vulnerable zones lead to flash floods, riverine flooding, and debris flows in some districts, while other districts simultaneously experience moisture deficits and drought stress. **The state thus faces a paradox of water-related disasters: too much water in some places and too little in others, often within the same season.**



2.2 Spatial Vulnerability Across Maharashtra's Regions

Understanding the geography of monsoon risk is essential to designing effective preparedness strategies:

- **Konkan Region (Mumbai, Thane, Raigad, Ratnagiri, Sindhudurg):** Characterised by extremely heavy rainfall, steep terrain, dense drainage networks, and high landslide susceptibility. The narrow coastal strip has limited capacity to absorb runoff, making flash flooding and landslides especially dangerous.
- **Western Maharashtra (Pune, Nashik, Kolhapur, Sangli, Satara):** Major river basins including the Krishna, Bhima, Godavari, and their tributaries carry monsoon runoff from the Western Ghats through densely populated agricultural heartlands. Dam operations in this region, particularly coordinated releases, are critical determinants of downstream flood risk.
- **Mumbai Metropolitan Region:** The megacity faces a unique combination of coastal flooding, storm surges, tidal influence, and overwhelmed stormwater systems. Impervious surfaces, encroached natural drainage channels, and a population exceeding 20 million concentrated in low-lying areas make urban flooding a recurrent and catastrophic hazard.
- **Marathwada and Vidarbha:** Although generally drier, these regions experience increasingly erratic and intense rainfall events associated with climate variability, leading to localised flooding interspersed with drought episodes. Delayed or failure of monsoon onset also triggers agrarian distress and seasonal migration.

2.3 Significant Monsoon Disaster Events

Maharashtra's recent disaster history underscores the scale of risk and the continuing gaps in preparedness. The following events illustrate the nature and intensity of monsoon-related disasters in the state:

Event / Year	Location	Nature of Impact & Key Lessons
Mumbai Floods (26 July 2005)	Mumbai Metropolitan Region	The Santacruz observatory recorded 944 mm of rainfall in 24 hours, the highest single-day rainfall recorded in Mumbai's modern history. The event caused catastrophic urban flooding, complete collapse of transport and communication networks, loss of over 1,000 lives, and extensive property damage. It exposed critical vulnerabilities in urban drainage infrastructure and emergency response mechanisms.
Konkan Floods (2019 & 2021)	Ratnagiri, Raigad, Sindhudurg (Konkan Belt)	Successive years of extreme monsoon rainfall triggered simultaneous flooding and landslides across the Konkan coastline. Critical infrastructure was damaged, thousands of residents were displaced, and large-scale emergency evacuations were conducted by state agencies and NDRF teams. The events highlighted the cascading risk dynamics in geographically fragile coastal zones.
Western Maharashtra Floods (Recurring)	Kolhapur, Sangli (Krishna & Panchganga Basins)	Recurrent extreme rainfall events and uncoordinated dam release operations have repeatedly led to large-scale inundation of hundreds of villages along the Krishna, Panchganga, and Koyna river basins. These events underscore the critical need for integrated dam management protocols, inter-district coordination, and community-level evacuation preparedness.
Pune Urban Flooding (2019, 2023)	Pune Municipal Area & Peri-urban Zones	Rapid urbanisation in floodplain areas, inadequate stormwater infrastructure, and encroachment on natural drainage channels have made Pune increasingly vulnerable to flash flooding. Heavy rainfall events in recent years have submerged residential areas, disrupted transport networks, and highlighted the urgent need for flood-risk-sensitive urban planning.

These events share a common thread: while hazard occurrence was not always predictable in its exact timing, the underlying vulnerabilities, inadequate infrastructure, insufficient inter-agency coordination, weak last-mile communication, and the absence of pre-validated preparedness plans were well-known beforehand. Pre-monsoon preparedness training directly addresses these institutional and operational gaps.

3. Basic Response Mechanism & Institutional Framework

India's disaster management governance is structured under the Disaster Management Act, 2005, which establishes a tiered institutional framework from National Disaster Management Authority (NDMA) at the apex, through State Disaster Management Authorities (SDMAs), to District Disaster Management Authorities (DDMAs) at the local level. In Maharashtra, the Maharashtra State Disaster Management Authority (MH-SDMA) is the nodal agency for

overseeing disaster risk reduction, preparedness planning, and response coordination across the state.

In the context of monsoon preparedness, response mechanism involves a coordinated functioning of multiple agencies operating at different scales:

Agency / Role	Key Responsibilities in Monsoon Response
India Meteorological Department (IMD)	Issuance of colour-coded weather warnings (Green, Yellow, Orange, Red); extended range and seasonal forecasts; district-level rainfall alerts; support to SDMA and DDMA for early action planning.
Central Water Commission (CWC)	Flood forecasting for major river basins; inflow and discharge monitoring; issuance of flood warnings for gauging stations; coordination with state irrigation departments.
Maharashtra Irrigation & Flood Control (I&FC) Dept.	State-level flood monitoring; dam and reservoir management; coordination of spillway operations; generation and dissemination of downstream flood warnings.
MH-SDMA / DDMA	Activation of State / District Emergency Operations Centres (EOCs); coordination of search and rescue; pre-positioning of response teams and resources; evacuation planning and shelter management.
NDRF / SDRF	Specialised search-and-rescue operations; deployment to high-risk zones in advance of peak monsoon events; training support to state and district responders.
Urban Local Bodies (ULBs)	Stormwater drain management; urban flood early warning; coordination of municipal emergency services; last-mile response in urban areas.
Revenue Department	Overall district-level coordination; relief and rehabilitation operations; damage assessment; inter-departmental coordination under the District Collector.

The effectiveness of this response ecosystem depends critically on the quality of inter-agency coordination, the ability of district officials to interpret and act on technical warnings, and the robustness of pre-established Standard Operating Procedures (SOPs). In practice, however, these conditions are rarely fully met — and it is precisely these institutional gaps that the pre-monsoon training seeks to address.

4. Gaps and Challenges in Monsoon Preparedness

Despite the existence of a comprehensive legislative framework, multiple early warning systems, and dedicated response forces, significant operational and institutional gaps continue to limit the effectiveness of monsoon preparedness and response in Maharashtra. These gaps are not attributable to any single failure but reflect systemic challenges at the interface of science, governance, and community action.

4.1 Warning Interpretation and Action Gaps

- Colour-coded weather warnings (Yellow, Orange, Red) issued by IMD need a transition from 'awareness of warning' to 'activation of response' remains weak.
- Flood inundation maps, dam safety protocols, and vulnerability atlases exist in several agencies but are rarely integrated into district preparedness plans in accessible, actionable formats.



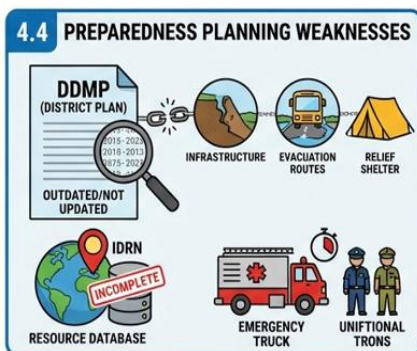
4.2 Inter-Agency Coordination Deficits



- Coordination between meteorological agencies (IMD, CWC), state flood control authorities (I&FC), and district administrations is frequently reactive rather than proactive, with information sharing occurring after an event rather than in advance.
- Delayed notifications from upstream dam authorities to downstream district administrations continue to result in avoidable flooding and loss of life.
- The roles and responsibilities of different agencies during multi-district, multi-hazard events are not always clearly defined in operational plans

4.3 Last-Mile Warning Dissemination

- Despite availability of multiple communication technologies (CAP-based alerts, SACHET, SMS, community radio, sirens), effective dissemination of timely, localised and actionable warnings to the most vulnerable communities particularly in remote, tribal, or coastal settlements remains severely constrained.
- Language barriers, literacy gaps and the absence of trained community-level volunteers mean that warnings frequently do not reach those who need them most.

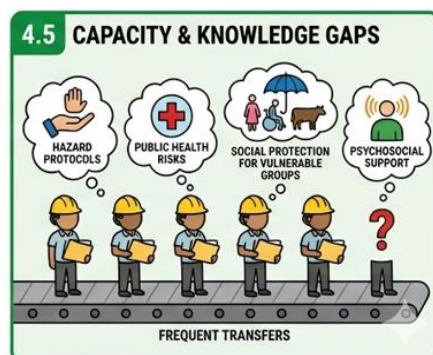


4.4 Preparedness Planning Weaknesses

- District Disaster Management Plans (DDMPs) in many districts are not regularly updated to reflect current hazard data, demographic changes or lessons from recent events.
- Pre-monsoon inspection and maintenance of critical infrastructure embankments, bridges, drainage systems, hospitals, evacuation routes, and relief shelters is irregular and not systematically linked to preparedness planning cycles. Resource mapping through platforms such as IDRN is incomplete.

4.5 Capacity and Knowledge Gaps

- Frequent transfers of district officials mean that institutional knowledge built through experience is regularly lost.
- Cross-cutting issues including public health risks during flooding, social protection for marginalised and vulnerable groups (women, elderly, persons



with disabilities, livestock-dependent communities), and psychosocial support are inadequately addressed in current preparedness frameworks.

Taken together, these gaps represent a significant and preventable burden of disaster risk. Addressing them requires not only better systems and technology but above all a well-trained, well-coordinated and proactive human institutions.

5. Rationale for the Pre-Monsoon Preparedness Training

Disaster preparedness is not an event; it is a continuous process that must be completed before the hazard arrives. Every year, there is a known, predictable window between the end of winter and the onset of the monsoon - roughly March to May, that offers the most critical opportunity to review, reinforce, and rehearse disaster preparedness systems. This window, if used well, can be the difference between a disaster that is managed and one that overwhelms. If lost, it cannot be recovered once the monsoon sets in.

The Pre-Monsoon Preparedness Training, scheduled from 6th to 8th May 2026, is specifically timed to maximise operational impact. Participants will return to their respective posts equipped with refreshed knowledge, updated skills, and concrete preparedness actions to implement, with just three to four weeks remaining before the expected monsoon onset.

6. Aim and Objectives of the Training Programme

To strengthen the capacities of government officials, disaster management practitioners, and emergency response personnel in Maharashtra to effectively plan, coordinate, and implement pre-monsoon preparedness and response measures.

By the end of this training programme, participants will be able to:

- i. Understand the monsoon-related hazard and risk landscape in Maharashtra, with particular attention to regional vulnerability patterns.
- ii. Interpret weather forecasts, impact-based warnings and flood advisories issued by meteorological and hydrological agencies.
- iii. Coordinate and apply inter-agency mechanisms, including the Incident Response System (IRS) for effective monsoon response.
- iv. Strengthen last-mile warning dissemination strategies and community-level preparedness activities.
- v. Address cross-cutting issues including social inclusion, public health risk reduction, and community resilience in monsoon preparedness planning.

7. Target Participants

The programme is designed for senior and mid-level officials who carry direct operational responsibility for monsoon preparedness and disaster response. The target group includes:

- i. Officials of Maharashtra State Disaster Management Authority (MH-SDMA) and YASHADA
- ii. District Disaster Management Authorities (DDMAs): District Collectors, Additional Collectors, and District Emergency Officers
- iii. Officials from Revenue, Irrigation & Flood Control, Urban Development, Public Works, and Health Departments
- iv. Representatives from Police, Fire Services, and State Disaster Response Force (SDRF)

- v. Officers from Urban Local Bodies (ULBs) and Municipal Corporations responsible for stormwater and emergency management

8. Training Methodology

- Technical sessions by experts from IMD, CWC, NDRF, NIDM, and MH-SDMA
- Interactive discussions and knowledge-sharing sessions among participants
- Group exercises and scenario-based preparedness planning
- **Tabletop Exercise (TTX):** A simulated multi-agency response to a realistic extreme rainfall scenario, testing coordination mechanisms, reporting protocols and decision-making under uncertainty

9. Registration and Venue

- **In-person registration at the venue will be done on Day 1 (6th May, 2026) from 0930 hrs at YASHADA, Pune.**
- Participants are advised to carry relevant identification and institutional nomination letters.

10. Organising Team

	NIDM	MH-SDMA	YASHADA
Patrons	Shri Madhup Vyas, IAS Executive Director	Smt. Vinita Vaid Singal (IAS) Principal Secretary, Disaster Management, Relief & Rehabilitation	Shri. Suhas Diwase (IAS), Director General
Course Coordinators & Team	Dr. Garima Aggarwal, Senior Consultant & Course Coordinator Mr. Shreyash Dwivedi Consultant	Dr. Bhalchandra P. Chavan (IAS), Director, DM Unit, MH-SDMA Mr. Shreedutt Kamat, Consultant Ms. Vaishali Mhaskey, Consultant	Shri Yogesh Lonkar Project Specialist

Programme Agenda

(Tentative)

Dates: 06th – 8th May, 2026

Day 1: 06.05.2026 (Wednesday)			
0930 – 1000	Registration		
1000 – 10.40	Inauguration	MH-SDMA/YASHADA/ NIDM	
1040 – 1100	Group Photo and Tea		
Time	Sessions	Pedagogy	Faculty
1100 – 1200 (60 minutes)	Session 1: Overview of Disaster Response - Multiagency and administrative coordination		Shri. Suhas Diwas, DG, YASHADA
1200 - 1300 (60 minutes)	Session 2: Introduction to Pre-monsoon Preparedness	Pre-test Ice-Breaking Exercise	Dr. Garima Aggarwal
1300 - 1400	Lunch Break		
Module I- Understanding Rainfall Patterns, Vulnerability Analysis and Early Warning Systems in Maharashtra			
1400- 1500 (60 minutes)	Session 3: Understanding of Rainfall Patterns and Flood Vulnerability in Maharashtra during Monsoon Season <i>Presentation may cover:</i> <ul style="list-style-type: none"> • Regional variations (High rainfall regions) and Projections for extreme rainfall events in districts/cities – e.g. Mumbai, Pune, Aurangabad and Nashik. • Highly exposed districts/ regions of Maharashtra • Cascading impacts of rainfall – flood, cloud burst and landslides 	PPT & Group Discussion	Mr. Sanap, IMD and Mr. Shreedutt Kamat
1500 - 1515	Tea Break		
1515 -1615 (60 minutes)	Session 4: Early Warning Systems framework of the State and Flood/ Water Management: Process of Observations, Flood analysis and warning Forecasting and Dissemination <i>Presentation may cover:</i> <ul style="list-style-type: none"> • Role of competent agencies such as IMD, CWC and I&FC in issuing multi-level alerts, gauging & surveillance (Flood control cell), flood forecasting, Reservoir/Dam Management and Releases, protocols for advance notifications for release, • Upstream and downstream coordination, demarcation of flood-prone area maps 	PPT & open Discussion	Mr. Ankit Dudeja , National Water Academy and Ms. Pallavi Gavali , Scientist CDAC, Pune

	identifying 25-50-100-year return period and warning formulation and dissemination – timings and trigger levels		
1615 - 1700 (45 minutes)	Session 5: Reporting, Communication Methods and Last Mile Connectivity Presentation may cover: <ul style="list-style-type: none"> Incidence Reporting, Formats, Information Flow, Standard protocols, role of EOCs etc Use of CAP/SACHET, SMS, Apps and social media Use of Mass Media and local alarm systems 	PPT and Open Discussion	SEOC- MH (Mr. Visheshkar Suryawanshi and team SDMA, Mr. Shreedutt Kamat and NIDM
1700 – 1800 (60 minutes)	Session 6: Flood Mapping and Vulnerability Analysis of Maharashtra <ul style="list-style-type: none"> Hazard assessment and Identification of hotspots Analysis of Physical and socio-economic vulnerabilities across districts/ coastal region/ Krishna river basins to highlight vulnerable settlements 	Group Discussion & Field Visit	Dr. Garima Aggarwal Mr. Shreyash Dwivedi Mr. Sreedutt
Day 2: 07.05.2026 (Thursday)			
Module II- Coordination, Resource Prioritisation and Infrastructure Safeguarding			
1000- 1015	Recapitulation of Day 1	By Participants	YASHADA/NIDM
1015 - 1130 (75 minutes)	Session 7: Issues and Challenges faced during Flood Response	PPT & Group Discussion	NDRF
1130 – 1145	Tea Break		
1145- 1300 (75 minutes)	Session 8: Creating and Action Plan for Flood Management and Safeguarding Critical Infrastructure Presentation may address: <ul style="list-style-type: none"> Prioritise Critical Infrastructures Identification and prioritization Interconnectivity Steps for Safeguarding them Formulation of SoP; Backup Plan Use of IDRN for resource mapping 	PPT & Group activity	Dr. Garima Aggarwal Mr. Shreyash Dwivedi
1300- 1400	Lunch Break		
1400- 1500 (60 minutes)	Session 9: Resource Prioritisation, Evacuation Planning and Management of Relief Centres/Shelters: Presentation may address:	PPT & Group Activity	Mr. Mahesh Lala Narvekar Director, Disaster Management

	<ul style="list-style-type: none"> Mobilisation of NDRF, SDRF and Armed forces during extreme events Site identification for interim shelters, standard amenities such as drinking water, sanitation facilities, medical aid, waste management and cattle management 		Department, BMC
1500- 1515	Tea Break		
1515- 1700 (105 minutes)	Observing IITM Forecasting System	Field Visit	Moderated by Dr. Garima Aggarwal/ Mr. Shreedutt Kamat
Day 3: 08.05.2026 (Friday)			
Module III- Response Mechanism and Table Top Exercise			
1000- 1015	Recapitulation of Day 2		NIDM/MH-SDMA
1015- 1115 (60 minutes)	Session 10: Incident Response System and Coordination with Emergency Response Systems <ul style="list-style-type: none"> IRS functioning in Maharashtra Inter-agency coordination Practical aspects of flood response 	PPT & Group Discussion	Dr. Balaji Chauhan, DRM Expert
1115 – 1130	Tea Break		
1130- 1230 (60 minutes)	Session 11: Tabletop exercise -1 Scenario: A recurring extreme rainfall event (e.g. 2005 Mumbai Floods or Konkan Floods (2021)) Testing Standard Reporting Protocols- Every 3 hours for L4 disaster level event, SITREPs to the CS/NERC	Table – Top Exercise	Dr. Garima Aggarwal, and Col. V. Supnekar, Retd. Faculty, YASHADA
1230- 1330 (60 minutes)	Session 12: Tabletop exercise -2 Scenario: A recurring extreme rainfall event (e.g. 2005 Mumbai Floods or Konkan Floods (2021)) Testing Standard Reporting Protocols- Every 3 hours for L4 disaster level event, SITREPs to the CS/NERC	Table – Top Exercise	Dr. Garima Aggarwal, / Col. V. Supnekar, Retd. Faculty, YASHADA
1330- 1430	Lunch Break		
1430 - 1530	Valedictory Session and Post-Training Assessment		
1520- 1530	Tea		