



**Building Resilient Cities –
Strategies for Effective Urban Flood Management**

**“Lessons Learnt from Recent Floods -
Improving Preparedness & Response”**

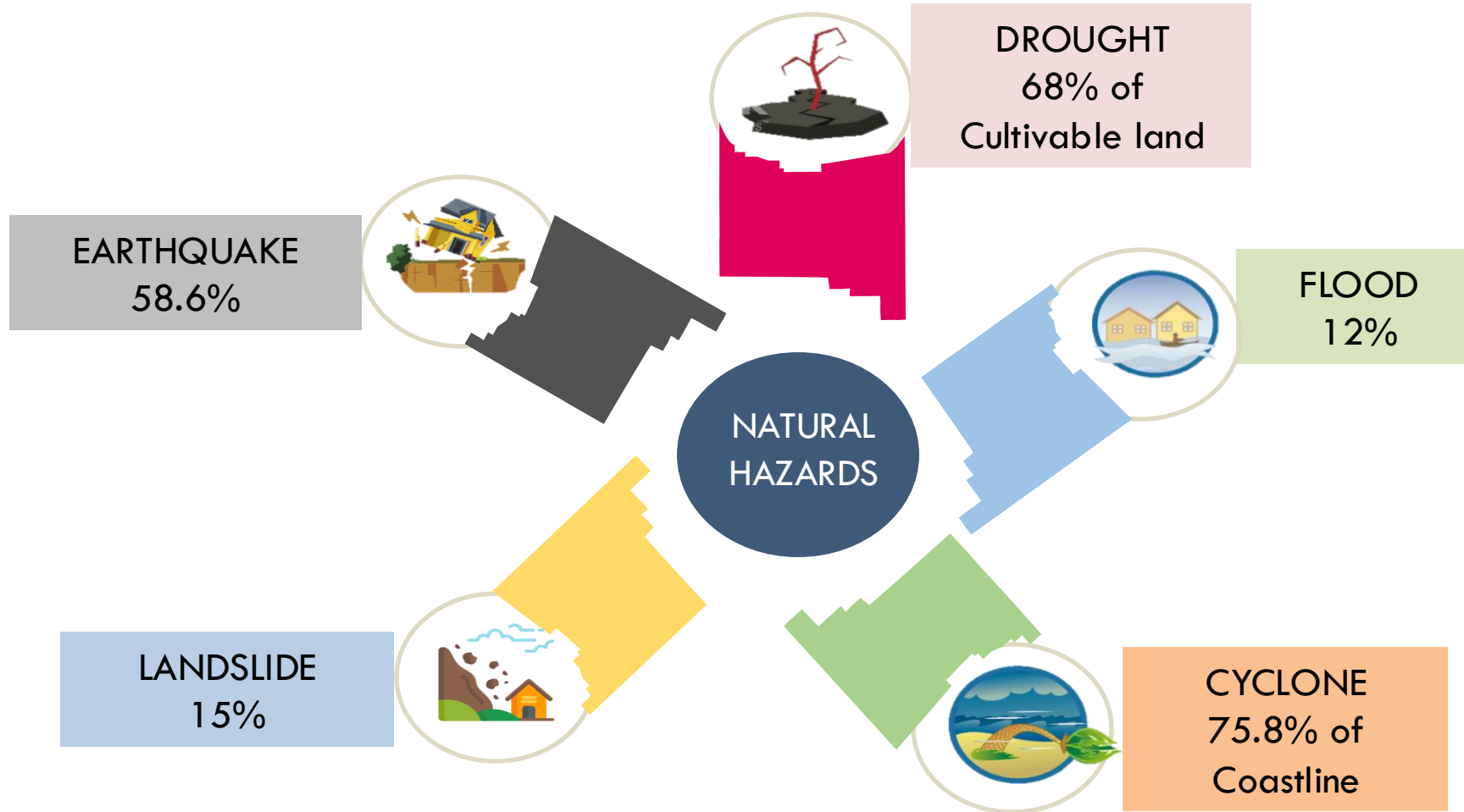


Plan of Presentation

- ✓ **Vulnerability Profile**
- ✓ **Deployment of NDRF**
- ✓ **Core Competency of NDRF**
- ✓ **Recent Flood Overview**
- ✓ **Lessons Learnt**
- ✓ **Improving Response & Preparedness**



Vulnerability Profile of India



Source -https://ndma.gov.in/sites/default/files/PDF/Reports/NDMA_Annual_Report_2021-22.pdf

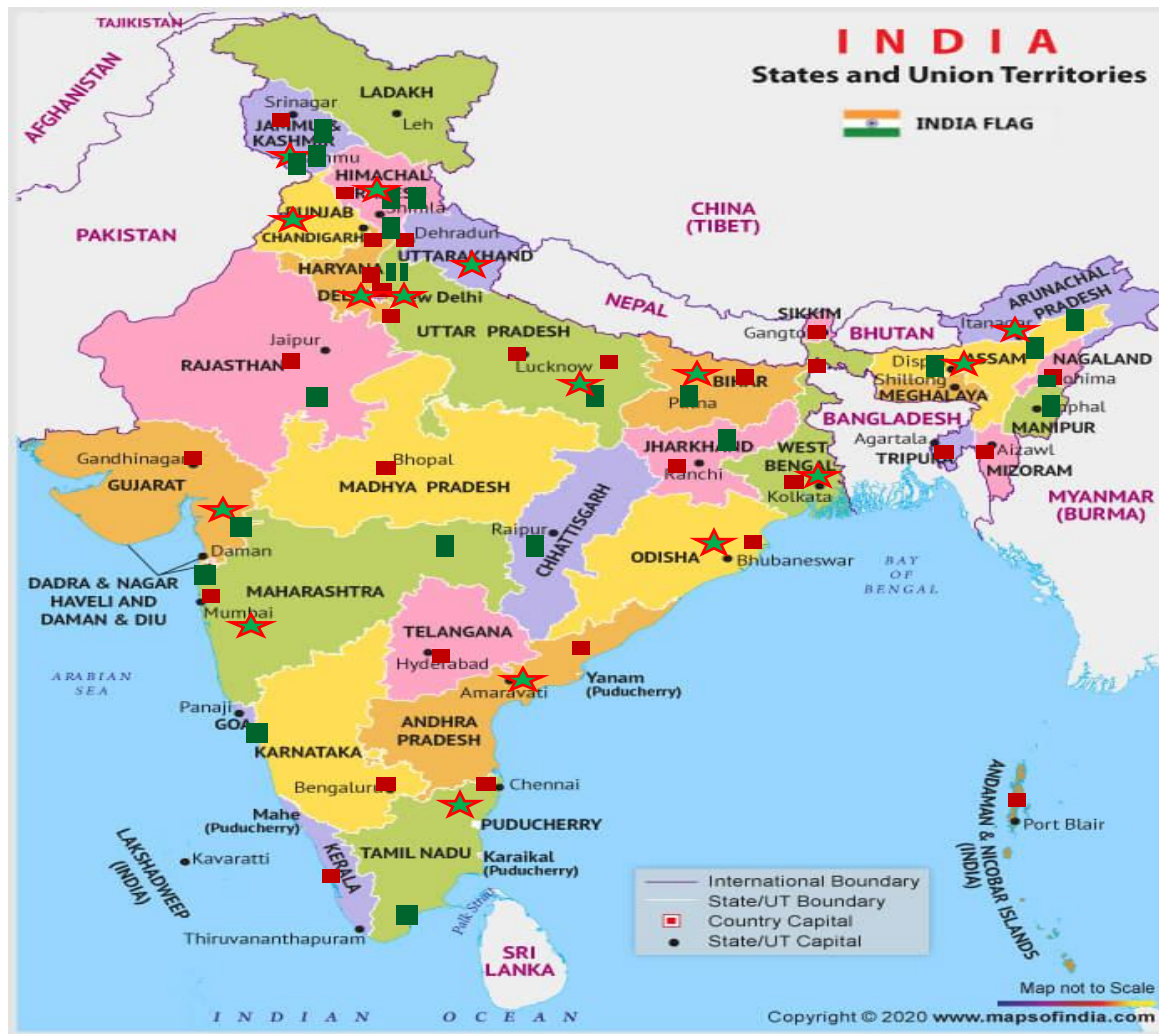


Resources - Location of NDRF BNs, RRCs & TPLs



EXISTING RRCs

1. Aizwal- 1 BN
2. Agartala- 1 BN
3. Kolkata- 2 BN
4. Siliguri- 2 BN
5. Pakyong- 2 BN
6. Balasore- 3 BN
7. Chennai- 4 BN
8. Thrissur/ Ernakulum – 4BN
9. Port Blair- 4 BN
10. Mumbai- 5 BN
11. Gandhinagar- 6 BN
12. Nareli- 6 BN
13. Panchkula- 7 BN
14. Noida- 8 BN
15. Supaul- 9 BN
16. Ranchi- 9 BN
17. Vishakhapatnam- 10 BN
18. Bangalore- 10 BN
19. Hyderabad- 10 BN
20. Lucknow- 11 BN
21. Gorakhpur-11 BN
22. Bhopal- 11 BN
23. Dimapur/kohima- 12 BN
24. Srinagar-13 BN
25. Nurgpur- 14 BN
26. Jhajra- 15 BN
27. Dwarka- 16 BN
28. R K Puram- 16 BN



BHQ

- 1 Bn Patgaon Assam
- 2 Bn Haringhata (WB)
- 3 Bn Mundali Odisha
- 4 Bn Arakkonam (TN)
- 5 Bn Pune (MH)
- 6 Bn Vadodara (Guj)
- 7 Bn Bhatinda (Punjab)
- 8 Bn Ghaziabad (UP)
- 9 Bn Bihta (Bihar)
- 10 Bn Vijayawada (A.P)
- 11 Bn Varanasi(U.P)
- 12 Bn Doimukh (AP)
- 13 Bn Ladhawal (Pun)
- 14 Bn Nurgpur (HP)
- 15 Bn Gadarpur (UKD)
- 16 Bn Dwarka (N/Delhi)

TPL

1. Guwahati (Assam)
2. Durg (Chhatisgarh)
3. Tirunelveli (TN) (NPP)
4. Nagpur (MH)
5. Palghar (MH) (NPP)
6. Surat (GJ) (NPP)
7. Kota (RJ) (NPP)
8. Rohtak (Haryana)
9. Jodhpur O. Hostel(Delhi)
10. Bulandshahr (UP) (NPP)
11. Didarganj, Patna (Bihar)
12. Deoghar (Jharkhand)
13. Uttar Kannada (KA) (NPP)
14. Varanasi Ghat (UP)
15. Dibrugarh (Assam)
16. Imphal West (Manipur)
17. Thizama, Kohima (Nagaland)
18. Udhampur (J & K)
19. Jammu (J & K)
20. Samba (J & K)
21. Rampur, Shimla (HP)
22. Nalagarh, Solan (HP)
23. Slapper, Mandi (HP)
24. IGI Airport (Delhi)

NDRF footprint at 68 locations (★ 16 BN HQ + ■ 28 RRCs + ■ 24 TPLs)



Core Competency of NDRF

Flood Disasters

Collapsed Structure Search & Rescue (CSSR)

CBRN Emergencies

High Rise/ Mountain Rescue

Forest Fires

Medical First Response (MFR)

Animal Disaster Response



Urban Floods



- Urban Floods a global phenomenon
- Increasing trend of urban floods in India.
- Since 1900 Delhi has experienced 9 major floods
- Recent Major Urban Floods in India – Srinagar (2014), Chennai (2015), Silchar (2022), Bengaluru (2022) Delhi (2023), Chennai (2023), Vadodara (2024), Vijaywada (2024)



Urban Floods








➤ **Common features in Urban Floods –**

- Excessive rains & sudden downpour
- Slow water out flow in drains due to improper desilting
- Garbage and construction materials in storm drains
- Barrage -jam/choked
- Large population impacted
- Damage to vital infrastructure
- Adverse effect on civic amenities
- Risk of epidemic



Some Recent Urban Floods



- Srinagar Flood (2014) 
- Chennai Flood (2015) 
- Silchar Flood (2022) 
- Delhi Flood (2023) 
- Vadodara Flood (2024) 
- Vijaywada Flood (2024) 



Challenges



- ✓ Limitations of Rain Forecasting
- ✓ Absence of infrastructure (storm drains) to cope up such heavy downpour
- ✓ Simultaneous release of water from reservoirs/dams - Dilemma
- ✓ Large settlements in flood plains - high density of population
- ✓ Deficiency of resources, manpower and equipment
- ✓ Power outage
- ✓ Communication issues



Challenges



- ✓ Health Care - hygiene and sanitation issues, drinking water scarcity, threat of epidemics
- ✓ Animal care & evacuation
- ✓ Panic & Rumour mongering
- ✓ Timely restoration of normalcy a challenge – in some areas inundation persists for long duration
- ✓ Media pressure



Challenges



Response Issues

- ✓ Setting priorities in rescue & relief a challenge
- ✓ Enhanced calls from affected persons & relatives
- ✓ Reluctance to leave homes
- ✓ Law and order issues
- ✓ Timely relief distribution is important
- ✓ Navigation problems due to narrow lanes & by-lanes,
- ✓ Risk to Rescuers – overhead electrical wires, open drains, manholes, outraged public
- ✓ Coordination issues – many times response officials among those affected, local reps not available



Preparedness & Response



1. Preparation for Worst-Case Scenario - based on past problems faced
2. Upgradation of DM Plan
3. Rain Status and Forecast – More focussed and actionable alerts
4. Issue of Advisories during monsoon – Common Alert Protocol (Sachet) & Cell broadcast
5. Identification of vulnerable/flood prone low-lying areas
6. Identification of evacuation centres & their benchmarking



Preparedness & Response



7. Establishment of logistics base in identified hot spot cities & towns with essential provisions
8. Database of locally available resources & manpower – boats, boatmen, swimmers
9. Communication Redundancy
10. Preparing the First Responders – CAP & SSP
11. Preparation of Aapda Mitras, NYKS and Volunteers – upgradation for effective response



Preparedness & Response



12. Capacity building of Response agencies
13. Conduct of Mock Exercises
14. Tactical Pre-positioning of NDRF/SDRF
15. Inter-Agency Coordination
16. Availability of local guides for outside agencies
17. Enforcement of Incident Response System (IRS) –
Clear Chain of Command



Thank You

