Keywords and key phrases

General DM Concepts

1. Disaster risk reduction (DRR)
2. Disaster resilience
3. Build Back Better (BBB)
4. Vulnerability assessment
5. Hazard mapping
6. Preparedness vs Response
7. Disaster cycle (mitigation, preparedness, response, recovery)
8. Risk governance
9. Community-based disaster management (CBDM)
10. Sendai Framework for DRR (2015–2030)

Indian Institutional Framework

11. Disaster Management Act 2005
12. National Disaster Management Authority (NDMA)
13. National Disaster Response Force (NDRF)
14. State Disaster Management Authorities (SDMAs)
15. District Disaster Management Authority (DDMA)
16. State Disaster Response Fund (SDRF)
17. Incident Response System (IRS)
18. National Disaster Mitigation Fund
19. Disaster Resilient Infrastructure (CDRI – Coalition)
20. India Disaster Resource Network (IDRN)

Types of Disasters

21. Hydro-meteorological disasters (floods, cyclones, droughts)
22. Geological disasters (earthquakes, landslides, tsunamis)
23. Biological disasters (pandemics, epidemics)
24. Industrial disasters (Bhopal Gas Tragedy)
25. CBRN hazards (Chemical, Biological, Radiological, Nuclear)
26. Glacial Lake Outburst Floods (GLOF)
27. Urban flooding
28. Heatwaves & cold waves
29. Coastal erosion
30. Desertification and droughts

Technology & DM

31. Early warning systems (EWS)
32. Doppler weather radar network
33. Space-based disaster monitoring (ISRO satellites)
34. GIS mapping
35. Remote sensing in DM
36. Mobile-based alerts (e.g., Cyclone early warnings)
37. Artificial intelligence for hazard prediction
38. Crowd-sourced disaster reporting
39. Drones in disaster relief
40. Disaster communication networks

Global Frameworks & Principles

41. Hyogo Framework for Action (2005–2015)
42. UNDRR (United Nations Office for Disaster Risk Reduction)
43. International Charter "Space and Major Disasters"

44. Paris Agreement link with climate-induced disasters
45. Sphere Standards in humanitarian relief
46. Sustainable Development Goals (SDG 13: Climate Action)
47. Climate adaptation & disaster risk integration
48. Global Assessment Report (GAR) on Disaster Risk Reduction
49. Humanitarian assistance & disaster relief (HADR)
50. Multi-hazard approach

Details of each subtopic (1pager)

1. Institutional Framework for Disaster Management

Keywords: DM Act 2005, NDMA, NDRF, SDRF, Incident Response System (IRS).

Facts/Data

1. India among the top 5 disaster-prone countries globally (UNDRR).
2. ~58% of landmass prone to earthquakes; 12% land to floods; 5700 km coastline vulnerable to cyclones.
3. NDRF has 16 battalions (~12,000 personnel) vs FEMA in US (20,000+ staff + $28B budget).
4. Japan spends ~0.8% of GDP on disaster resilience, India <0.1%.
5. India ranks 7th on Global Climate Risk Index 2021 (Germanwatch).

Analysis: Framework is strong legally but gaps remain in capacity, funding, early warning dissemination, and state-level preparedness. Coordination issues persist.

Examples: Kerala floods (2018), Odisha's cyclone preparedness (Praised globally by UN).

Conclusion: DM in India has evolved but needs decentralisation, technology infusion, and sustained funding.

2. Urban Floods

Keywords: Encroachment, drainage, sponge city, carrying capacity.

Facts/Data

1. 74% of Indian cities vulnerable to floods NIUA).
2. Bengaluru floods (2022) caused ₹225 crore/day losses.
3. Mumbai rainfall (2021): 200mm+ in 12 hrs; drainage capacity outdated.
4. China's "Sponge City" project aims at 80% rainwater absorption by 2030.
5. Netherlands "Room for the River" project = global benchmark.

Analysis: Poor urban planning, blocked drains, loss of wetlands. Climate change makes rainfall erratic, overwhelming weak infrastructure.

Examples: Kochi sponge city pilot; Yamuna floodplain restoration in Delhi.
Conclusion: Urban floods reflect governance failure, not natural inevitability—green infrastructure and strict planning are the cure.

3. Earthquakes in India

Keywords: Himalayan convergence, plate tectonics, liquefaction, seismic zoning.

Facts/Data

1. India has 59% landmass prone to earthquakes.
2. Himalayas = Seismic Zone V, most active.
3. Gujarat 2001 quake killed ~20,000; Nepal 2015 quake killed ~9,000.
4. US: California follows strict quake-resistant codes; Japan uses base isolation technology.
5. India's compliance with National Building Code remains <30% in most states.

Analysis: Structural vulnerability, non-compliance of building codes, high population density increases disaster risk.

Examples: Bhuj 2001, Nepal 2015, Turkey 2023 quake lessons.
Conclusion: Mitigation requires enforcing codes, retrofitting old structures, and community drills.

4. Cyclones & Early Warning

Keywords: IMD, Doppler radar, cyclone shelters, evacuation.

Facts/Data

1. ~8% of world's cyclones affect India (IMD).
2. Odisha 1999 super cyclone killed ~10,000; Cyclone Fani (2019) deaths = <100 (preparedness success).
3. IMD now gives 72–120 hr advance warnings, on par with US/Europe.
4. Japan & US invest heavily in AI-based cyclone prediction.
5. India's cyclone shelters = 800+; yet gaps in coastal Andhra & West Bengal.

Analysis: IMD's early warning has drastically reduced casualties, but property & livelihood losses remain high.

Examples: Fani (2019), Amphan (2020).

Conclusion: Prediction is a strength; resilience of infrastructure & livelihoods is the next frontier.

5. Concept of "Build Back Better"

Keywords: Resilient recovery, sustainability, Sendai Framework.

Facts/Data

1. Adopted in Sendai Framework 2015–2030 as core principle.
2. India spends <15% of post-disaster funds on resilience (NDMA report).
3. Japan invests ~40% of disaster recovery budgets on resilient rebuilding.
4. 2018 Kerala floods – rebuilding with elevated houses + river basin planning = case of partial BBB.
5. Philippines post-Haiyan (2013) = successful BBB with storm-resilient housing.

Analysis: India still rebuilds to old standards—ignoring lessons. True BBB means resilient infrastructure, sustainable livelihoods, and ecological safeguards.

Examples: Kerala 2018; Bhuj reconstruction (mixed success).

Conclusion: BBB transforms disasters into opportunities for resilience; India must institutionalise it in all recovery frameworks.

6. NDMA Act 2005 – Adequacy & Gaps

Keywords: Paradigm shift from relief to prevention, top-down structure, decentralisation.

Facts/Data

1. DM Act 2005 established NDMA, NDRF, SDMAs as statutory bodies.
2. India spends only 0.93% of GDP on disaster risk reduction, Japan ~0.8% but more efficiently targeted.
3. UNDRR notes: 85% of disasters in India are climate-related.
4. Over 30 states/UTs have SDMAs, but <50% meet funding/technical benchmarks.
5. US FEMA = budget ~$28B vs India's NDRF corpus ₹28,000 crore ($3.5B).

Analysis: Strong legal base but gaps in state capacity, community participation, and financing. More centralised than community-driven.

Examples: Success in cyclone preparedness (Odisha); failure in Joshimath (2023) due to ignored risk assessments.

Conclusion: DM Act needs updating for climate-induced disasters and community-led planning.

7. Climate-Induced Disasters

Keywords: Heatwaves, glacial lake outburst floods (GLOFs), erratic rainfall, sea-level rise.

Facts/Data

1. India lost $87 billion to climate disasters in 2020 (World Bank).
2. Heatwaves killed 3,812 people between 2015–2022 (IMD).
3. Himalayan glaciers retreating at 20m/year (WMO 2023).
4. IPCC AR6: South Asia will see 2.7°C warming by 2100 under current trajectory.
5. BRICS – Brazil & South Africa face droughts, Russia wildfires, India/China floods—common climate vulnerabilities.

Examples: Chamoli GLOF 2021; Chennai floods 2015.
Conclusion: Climate adaptation is no longer optional—mainstreaming it into DM is survival strategy.

8. Landslides in India

Keywords: Fragile Himalayas, unscientific construction, rainfall-induced slides.

Facts/Data

1. India accounts for 12.6% of global landslides (ISRO, 2022).
2. 66% of landslides occur in Himalayas & NE India.
3. 2023 Himachal rains triggered >250 landslides, killing 400+.
4. US/China invest heavily in slope stabilisation tech, India relies on post-disaster relief.
5. Economic losses: ₹2,000+ crore annually.

Examples: Joshimath subsidence 2023; Kedarnath tragedy 2013.
Conclusion: Strict zoning, scientific EIA, and slope stabilisation are vital for Himalayan resilience.

9. Community-Based Disaster Management (CBDM)

Keywords: Bottom-up planning, local knowledge, Panchayats, SHGs.

Facts/Data

1. UNDP: CBDM reduces casualties by 30–40%.
2. Odisha SHG women successfully managed cyclone shelters (2019).
3. India's 2.6 million elected women representatives are critical for inclusive DM.
4. Japan uses community drills yearly; India still patchy.
5. Nepal earthquake (2015): villages with prior CBDM had 30% lower mortality.

Examples: Odisha cyclone model; Kerala fisherfolk as first responders in 2018 floods.
Conclusion: Communities are the first responders—DM is effective only when people are empowered, not just agencies.

10. Role of Armed Forces, NGOs & Media

Keywords: Military logistics, humanitarian assistance, civil-military coordination, accountability.

Facts/Data

1. Indian Armed Forces = backbone of HADR (Humanitarian Assistance & Disaster Relief).
2. INDRF conducted 20+ international relief ops in last decade (Nepal 2015, Turkey 2023 quake).
3. NGOs contributed 40% of relief distribution in Kerala floods 2018.
4. US military spends ~$1.5B annually on HADR capacity; India's defence budgets rarely earmark explicitly.
5. Media: social media warnings saved thousands in Cyclone Fani (2019).

Examples: "Operation Rahat" (Yemen evacuation, 2015); Air Force in Uttarakhand 2013.
Conclusion: Synergy of state, armed forces, NGOs, and media ensures disasters don't spiral into humanitarian crises.