Disaster Management in India

Part of: GS-III- Disaster Management (PT-MAINS-PERSONALITY TEST)

Disruption on a massive scale, either natural or man-made, occurring in short or long periods of time is termed as Disaster. Disaster management in India has been an important point of discussion owing to frequent natural disasters ranging from earthquakes, floods, drought etc.

What is a Disaster?

A disaster is defined as a disruption on a massive scale, either natural or man-made, occurring in short or long periods of time. Disasters can lead to human, material, economic or environmental hardships, which can be beyond the bearable capacity of the affected society. As per statistics, India as a whole is vulnerable to 30 different types of disasters that will affect the economic, social and human development potential to such an extent that it will have long-term effects on productivity and macro-economic performance.

Disasters can be classified into the following categories:

- **Water and Climate Disaster:** Flood, hail storms, cloudburst, cyclones, heat waves, cold waves, droughts, hurricanes.
- **Geological Disaster:** Landslides, earthquakes, volcanic eruptions, tornadoes
- **Biological Disaster:** Viral epidemics, pest attacks, cattle epidemic and locust plagues
- **Industrial Disaster:** Chemical and industrial accidents, mine shaft fires, oil spills,
- **Nuclear Disasters:** Nuclear core meltdowns, radiation poisoning
- **Man-made disasters:** Urban and forest fires, oil spill, the collapse of huge building structures

What is Disaster Management?

Per the Disaster Management Act of 2005 defines Disaster Management as an integrated process of planning, organizing, coordinating and implementing measures which are necessary for-

1. Prevention of threat of any disaster
2. Reduction of risk of any disaster or its consequences
3. Readiness to deal with any disaster
4. Promptness in dealing with a disaster
5. Assessing the severity of the effects of any disaster
6. Rescue and relief
7. Rehabilitation and Reconstruction

Agencies involved in Disaster Management

- **National Disaster Management Authority (NDMA):** The National Disaster Management Authority, or the NDMA, is an apex body for disaster management, headed by the Prime Minister of India. It is responsible for the supervision, direction and control of the National Disaster Response Force (NDRF).
- **National Executive Committee (NEC):** The NEC is composed of high profile ministerial members from the government of India that include the Union Home Secretary as
Chairperson, and the Secretaries to the Government of India (GoI) like Ministries/Departments of Agriculture, Atomic Energy, Defence, Drinking Water Supply, Environment and Forests etc. The NEC prepares the National Plan for Disaster Management as per the National Policy on Disaster Management.

- **State Disaster Management Authority (SDMA):**- The Chief Minister of the respective state is the head of the SDMA. The State Government has a State Executive Committee (SEC) which assists the State Disaster Management Authority (SDMA) on Disaster Management.

- **District Disaster Management Authority (DDMA):**- The DDMA is headed by the District Collector, Deputy Commissioner or District Magistrate depending on the situation, with the elected representatives of the local authority as the Co-Chairperson. The DDMA ensures that the guidelines framed by the NDMA and the SDMA are followed by all the departments of the State Government at the District level and the local authorities in the District.

- **Local Authorities:**- Local authorities would include Panchayati Raj Institutions (PRI), Municipalities, District and Cantonment 11 Institutional and Legal Arrangements Boards, and Town Planning Authorities which control and manage civic services.

### Causes for Occurrence of Disaster

- **Environmental degradation:** Removal of trees and forest cover from a watershed area have caused, soil erosion, expansion of flood plain area in upper and middle course of rivers and groundwater depletion.
- **Developmental process:** Exploitation of land use, development of infrastructure, rapid urbanization and technological development have caused increasing pressure over the natural resources.
- **Political issues:** War, nuclear power aspirations, fight between countries to become super power and conquering land, sea and skies. These have resulted into wide range of disaster events such as Hiroshima nuclear explosion, Syrian civil war, growing militarisation of oceans and outer space.
- **Industrialization:** This has resulted into warming of earth and frequency of extreme weather events has also increased.

### Impacts of Disaster

- Disaster impacts individuals physically (through loss of life, injury, health, disability) as well as psychologically.
- Disaster results in **huge economic loss** due to destruction of property, human settlements and infrastructure etc.
- Disaster can alter the natural environment, loss of habitat to many plants and animals and cause ecological stress that can result in biodiversity loss.
- After natural disasters, food and other natural resources like water often becomes scarce resulting into food and water scarcity.
- The disaster results in **displacement of people**, and displaced population often face several challenges in new settlements, in this process poorer becomes more poor.
- Disaster increases the level of vulnerability and hence multiply the effects of disaster.

### Vulnerability Profile of India

- India is vulnerable, in varying degrees, to a large number of disasters. **Around 59% of the**
landmass is prone to earthquakes of moderate to very high intensity.
- About 12% (over 40 million hectares) of its land is prone to floods and river erosion.
- Close to 5,700 kms, out of the 7,516 kms long coastline is prone to cyclones and tsunamis.
- 68% of its cultivable area is vulnerable to droughts; and, the hilly areas are at risk from landslides and avalanches.
- Moreover, India is also vulnerable to chemical, biological, radiological and nuclear (CBRN) emergencies and other man-made disasters.
- Disaster risks in India are further compounded by increasing vulnerabilities related to changing demographics and socio-economic conditions, unplanned urbanization, development within high-risk zones, environmental degradation, climate change, geological hazards, epidemics and pandemics.
- Clearly, all these contribute to a situation where disasters seriously threaten India’s economy, its population and sustainable development.

Worst Disasters in India

- **Kashmir Floods (2014)** affected Srinagar, Bandipur, Rajouri etc. areas of J&K have resulted into death of more than 500 people.
- **Uttarakhand Flash Floods (2013)** affected Govindghat, Kedar Dome, Rudraprayag district of Uttarakhand and resulted into death of more than 5,000 people.
- **The Indian Ocean Tsunami (2004)** affected parts of southern India and Andaman Nicobar Islands, Sri Lanka, Indonesia etc., and resulted in the death of more than 2 lakh people.
- **Gujarat Earthquake (2001)** affected Bhuj, Ahmedabad, Gandhinagar, Kutch, Surat, Surendranagar, Rajkot district, Jamnagar and Jodia districts of Gujarat and resulted in death of more than 20,000 people.
- **Odisha Super Cyclone or Paradip cyclone (1999)** affected the coastal districts of Bhadrak, Kendrapara, Balasore, Jagatsinghpur, Puri, Ganjam etc., and resulted into death of more than 20,000 people.
- **The Great Famine (1876-1878)** affected Madras, Mysore, Hyderabad, and Bombay and resulted into death of around 3 crore people. Even today, it is considered as one of the worst natural calamities in India of all time.
- **Coringa Cyclone (1839)** that affected Coringa district of Andhra Pradesh and **Calcutta Cyclone (1737)** are some other instances of natural calamities faced by the country in the past.
- **The Bengal Famine** in the years 1770 and 1943 affected Bengal, Odisha, Bihar very badly and resulted into death of nearly 1 crore people.
- **Bhopal Gas tragedy (December, 1984)** is one of the worst chemical disasters globally that resulted in over 10,000 losing their lives (the actual number remains disputed) and over 5.5 lakh persons affected and suffering from agonizing injuries.
- In recent times, there have been
  - cases of railway accidents (Dussehra gathering on the railway tracks crushed by the trains in 2018),
  - fire accidents in hospitals due to negligence and non-implementation of existing mandatory fire safety norms,
  - collapse of various infrastructure constructs like flyovers, metro tracks and residential buildings due to poor quality of construction, illegal addition of floors and recurring floods.
Stampede at large public gathering like Kumbh Mela caused by poor people management and lack of adequate infrastructure to monitor and manage large crowd gathering.

Stages in Disaster Management

- Disaster Management efforts are geared towards disaster risk management.
- Disaster Risk Management implies the systematic process of using administrative decisions, organisation, operational skills, and capacities to implement policies, strategies and coping capacities of the society and communities to lessen the impact of natural hazards and related environmental and technological disasters.
- These comprise all forms all activities including structural and non-structural measures to avoid (prevention) or to limit (mitigation and preparedness) adverse effects of hazards.
- There are three key stages of activities in disaster management:
  1. **Before a disaster:** to reduce the potential for human, material, or environmental losses caused by hazards and to ensure that these losses are minimised when disaster strikes;
  2. **During a disaster:** to ensure that the needs and provisions of victims are met to alleviate and minimise suffering; and
  3. **After a disaster:** to achieve rapid and durable recovery which does not reproduce the original vulnerable conditions.

The different phases of disaster management are represented in the disaster cycle diagram.

Disaster Risk Reduction (DRR)

- Disaster risk reduction is the concept and practice of reducing disaster risks through systematic efforts to analyse and reduce the causal factors of disasters.
- **Pre-Disaster risk reduction includes**-
  - **Mitigation:** To eliminate or reduce the impacts and risks of hazards through proactive measures taken before an emergency or disaster occurs.
  - **Preparedness:** To take steps to prepare and reduce the effects of disasters.
- **Post-Disaster risk reduction includes**-
  - **Rescue:** Providing warning, evacuation, search, rescue, providing immediate assistance.
  - **Relife:** To respond to communities who become victims of disaster, providing relief measures such as food packets, water, medicines, temporary accommodation, relief camps etc.
  - **Recovery:** This stage emphasises upon recovery of victims of disaster, recovery of damaged infrastructure and repair of the damages caused.

Disaster Risk Reduction in Sustainable Development Goals

- **Goal 1:** Target 1.5, which relates to building the resilience of the poor, further strengthens the position of disaster risk reduction as a core development strategy for ending extreme poverty.
- **Goal 2:** Target 2.4 supports the immediate need to advance actions in mainstreaming disaster risk reduction and **climate adaptation into agriculture sector planning** and investments in order to promote resilient livelihoods, food production and ecosystems.
Goal 3: Target 3.d, relates to strengthening early warning and risk reduction of national and global health risks presents an opportunity to further actions to promote resilient health.

Goal 4: Target 4.7 focusing on building and upgrading education facilities and promoting education for sustainable development, contribute significantly to resilience-building in the education sector.

Goal 6: Target 6.6, which relates to protecting and restoring water-related ecosystems, will significantly contribute to strengthening the resilience of communities to water-related hazards.

Goal 9: Targets 9.1 related to developing sustainable and resilient infrastructure development are vital not only to protect existing infrastructure but also future infrastructure investments.

Goal 11: Action targets under this goal (11.1, 11.3, 11.4, 11.5, 11.b and 11.c) focusing on upgrading urban slums, integrated urban planning, reducing social and economic impacts of disaster risk, building the resilience of the urban poor, adopting and implementing urban policies in line with the Sendai Framework and building sustainable and resilient urban infrastructure, are strategic opportunities to ensure increased capacity to support cities, to protect current and future development prospects and to build safer, more resilient cities throughout the world.

Goal 13: Target actions under this goal, focusing on strengthening resilience and adaptive capacity, capacity building and integrating climate change measures into policies and plans, awareness raising on climate adaptation and early warning (Targets 13.1 to 13.3 and 13.a to 13.b) provide opportunities to strengthen the integration between disaster and climate resilience and to protect broader development paths at all levels.

Goal 14: Target action 14.2, focusing on the sustainable management and protection as well as strengthening resilience of marine and coastal ecosystems, can contribute to reducing disaster risk and increase in demand for healthy marine and coastal ecosystems.

Goal 15: Target actions 15.1 to 15.4 and 15.9, focus on managing and restoring forests, combating land degradation and desertification, conserving mountain ecosystems and their biodiversity and integrating ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies. These targets are also in line with the Sendai Framework focus on building environmental resilience through the inclusion of ecosystems in risk analysis and planning.

Challenges in Disaster Risk Reduction

- There are insufficient levels of implementation for each monitored activity. For example, Disaster risk management plans or a risk sensitive building codes exist but they are not enforced because of a lack of government capacity or public awareness.
- There is lack of local capacities to implement disaster risk management. Weak capacity at the local levels undermines the implementation Disaster preparedness plans.
- Absence of integration of climate change into Disaster risk management plans.
- There is divergence of obtaining political and economic commitments due to other competing needs and priorities such as poverty reduction, social welfare, education etc. require greater attention and funding.
- Due to poor coordination between stakeholders, there is inadequate access with respect to risk assessment, monitoring, early warning, disaster response and other Disaster related activities.
Insufficient investment in building disaster resilient strategies, also private sector are least contributors in the share of investment.

Organisations related to Disaster Management Framework at Global level

- In 1994 the World Conference on Natural Disaster Reduction was held in Yokohama, Japan.
  - The conference adopted the Yokohama strategy and declared the decade 1990-2000 as the International Decade for Natural Disaster Reduction (IDNDR).
- United Nations Office for Disaster Risk Reduction (UNISDR) is the successor to the secretariat of IDNDR and was created in 1999 to implement UN Disaster Risk Reduction strategy.
- The Hyogo Framework for Action (HFA) is a 10-year plan (2005-2015) to make the world safer from natural hazards. Priorities such as, Disaster risk reduction, identification, assessment through legal and policy frameworks, disaster preparedness and use of innovation was adopted.
- The Sendai Framework for Disaster Risk Reduction 2015-2030, is the successor instrument to the Hyogo Framework.
  - It is a non-binding agreement, which the signatory nations, including India, will attempt to comply with on a voluntary basis.
- There are three international agreements within the context of the post-2015 development agenda. These are:
  - The Sendai Framework.
  - Sustainable Development Goals 2015-2030
  - The Paris agreement (COP 21) on Climate Change.
- These three agreements recognize the desired outcomes in Disaster Risk Reduction as a product of interconnected social and economic processes, which overlap across the agendas of the three agreements.

Organisations an Policies related to Disaster Management Framework at National level

National Disaster Management Authority of India (NDMA)

- It was established in 2005, under the Disaster Management Act 2005.
- The objective of NDMA is, to build a safer and disaster resilient India by a holistic, proactive, technology driven and sustainable development strategy.
- The NDMA is chaired by the Prime Minister of India and has a vice chairman with the status of Cabinet Minister and eight members with the status of Ministers of State.
- The NDMA Secretariat is headed by a Secretary and deals with mitigation, preparedness, plans, reconstruction, community awareness and financial and administrative aspects.

National Disaster Management Plan (NDMP)

- It was released in 2016, it is the first ever national plan prepared in the country for disaster management.
- With National Disaster Management Plan (2016) India has aligned its National plan with the Sendai Framework for Disaster Risk Reduction 2015-2030, to which India is a signatory.
- The objective of the plan is to make India disaster resilient, achieve substantial disaster risk reduction. It aims to significantly decrease the losses of life, livelihoods, and assets in
terms of economic, physical, social, cultural, and environmental. To maximize the ability to cope with disasters at all levels of administration as well as among communities.

State Disaster Management Authority (SDMA)

- At State level, State Disaster Management Authorities are established under Disaster Management Act 2005.
- **SDMA is chaired by the Chief Minister of the State** and has not more than eight members who are appointed by the Chief Minister.
- The SDMA prepares the state disaster management plan and implements the National Disaster Management Plan.

District Disaster Management Authority (DDMA)

- Under Disaster Management Act 2005, every State government shall establish a DDMA for every district in the State.
- The DDM Authority shall consist of:
  - **Chairperson** - the Collector or District Magistrate or Deputy Commissioner act as Chairperson of DDMA.
  - **Co-Chairperson** - is the elected representative of the local authority. In the Tribal Areas, the Chief Executive Member of the district council of autonomous district is the co-chairperson.
- There are not more than seven other members in DDMA.
- The Disaster Management Committee governed under District Magistrate will **formulate village level disaster management plans** for concern villages.
- The DDMA makes District Disaster Management Plan and implements the state Disaster Management Plan.

**No Planning commission today

Government Initiatives

- India is a **signatory to the Sendai Framework for Disaster Risk Reduction** and is committed to achieve the priorities and objectives through systematic and institutional efforts.
- With multi-dimensional initiatives and expertise, India is taking a leading role in strengthening regional cooperation among South Asian countries for reducing disasters.
- India is one of the participating countries and works closely with the United Nations International Strategy for Disaster Reduction (UNISDR). India has been working closely with many countries for the exchange of ideas and expertise in disaster management.
- **National Disaster Management Plan (NDMP)** defines the roles and responsibilities of various stakeholders including Central Ministries/Departments, State Governments, UT Administrations, District Authorities and local self Governments.
- **Primary responsibility of disaster management rests with the States.** The Central Government conducts regular mock drill, community training and awareness programme to prepare the civilian populations for disasters.
- **National Disaster Management Services (NDMS)** was conceived by NDMA during 2015-16 for setting up of **Very Small Aperture Terminal (VSAT) Network** connecting MHA, NDMA, NDRF etc. to provide the failsafe communication infrastructure and technical
support for Emergency Operation Centre (EOC) operations across the country.

- NDMA has taken an initiative on **Earthquake Disaster Risk Indexing (EDRI)** for 50 important cities and 1 District in Seismic Zone IV & V areas.
  - This kind of indexing will be helpful in comparing the overall risk across large number of cities or region and also in prioritization of cities to implement appropriate disaster mitigation measures.
- NDMA through *Building Materials & Technology Promotion Council (BMTPC)* has prepared **Upgraded Earthquake Hazard Maps and Atlases** for the country for better planning and policies.
- Leveraging the technology of geographic information system (GIS), NDMA have taken up a project for **disaster risk management by establishing GIS Server** and creation of database to integrate data obtained from various stakeholders to increase disaster preparedness, mitigation, damage assessment, response and relief management efforts.
- Under the **National School Safety Programme (NSSP)**, 8600 schools (with 200 schools in 43 districts in 22 States/UTs falling seismic zones IV and V) have been selected for providing training on school safety and disaster preparedness.
- **The Aapdamitra scheme of NDMA** has provision for training 6000 community volunteers in disaster response in 30 most flood prone districts (200 volunteers per district) in 25 States.
- The government has set up **National Crisis Management Committee and Crisis Management Group**.
- The state governments have set up **state crisis management groups headed by chief secretaries**, institutes of relief commissioners and state/district contingency plans.
- The disaster management policy of the government stresses on forecasting and warning using advanced technologies, **contingency agricultural planning** to ensure availability of food grains, and preparedness and mitigation through specific programmes.
- Project on **deployment of Mobile Radiation Detection Systems (MRDS)** to handle Radiological Hazards in Metros/Capital Cities/Big Cities in India to detect unclaimed radioactive materials/substances and save public from its hazardous effects.
- **Landslide Risk Mitigation Scheme (LRMS)** envisages financial support for site specific Landslide Mitigation Projects recommended by landslide prone States, covering disaster prevention strategy, disaster mitigation and R&D in monitoring of critical Landslides thereby leading to the development of Early Warning System and Capacity Building initiatives. The Scheme is under preparation.
- Core Group has been formed for Preparation of Guidelines to avert Boat Tragedies in India.

### Disaster Management in India: Success stories

- The Indian government's "**zero casualty**" policy for cyclones and the pinpoint accuracy of the India Meteorological Department's (IMD) early warning system has helped reduce the possibility of deaths from **cyclone Fani in Odisha**.
- India's policy of **minimising fatalities from cyclones** has been proven by past performances as in **cyclone Phailin in 2013**, when famously the casualty rate was kept to as low as 45 despite the intensity of the storm.
- In August 2010 during the **flash floods due to cloudburst in Leh in Ladakh** region by the Indian Army. The **Army's immediate search, rescue, and relief operations** and mass casualty management effectively and efficiently mitigated the impact of flash floods, and restored normal life.
Bihar suffers from floods almost every year during the monsoon season, predominantly due to the Ganges and its tributaries. The State has successfully scaled up disaster preparedness and mitigation efforts since 2011.

Issues

- There are significant gaps in preparedness on various aspects of risk management, particularly for catastrophic disasters like major earthquakes and floods.
  - Though all of India’s states have departments of disaster management or relief and rehabilitation, they are still poorly prepared to lend support in times of disasters, according to the UN Development Programme (UNDP).
  - In a number of recent disasters, 2010 mudslides in Leh, Sikkim earthquake in 2011 and the Uttarakhand floods of 2013, the level of preparedness was inadequate, leading to high levels of mortality and displacement of people.
- Facilities such as emergency operations centres, emergency communications, and search and rescue teams are being made available but these systems and facilities need to be strengthened.
- In India Disaster management is yet to be seen as an essential part of good governance and integral to development planning.
  - The preparedness at various levels are not people-oriented.
  - India’s capacity to manage disaster risk is challenged by its size and huge population. The country is likely to have the greatest exposure of any nation in the world to extreme weather and natural disasters by 2030.
  - The northeast region is most at risk from earthquakes and lacks seismically secure infrastructure and buildings. It is also vulnerable to landslides, floods and erosion.
  - Flooding on the country’s plains is a regular occurrence, and although communities are resilient, the intensity of floods has reduced their capacity to adapt.
  - The local adaptation efforts driven solely by communities are no longer sufficient and additional, scientifically planned adaptation is needed, which will require government support.
  - The division of responsibilities under the Disaster Management Act is not very clear, resulting in its poor implementation. There also exists an overlap between the implementing agencies
  - Intense public and media scrutiny after disasters automatically leads to a higher priority being given to response, rather than risk reduction.
  - Furthermore, where risk-reduction activities are described, State Disaster Management Plans (SDMPs) does not institutionalise accountability mechanisms to ensure that departments follow these considerations in their own planning. As a result, risk-reduction activities are driven by schemes and external projects, rather than by guidelines in SDMPs.
  - Because risk-reduction needs are locations specific, this gap is an opportunity for stronger, locally led risk-reduction planning by Strengthening disaster risk management in India

Suggestions

- A clearer demarcation of national and state-level responsibilities is needed, especially regarding who is responsible for risk-reduction activities.
- It is vital for state disaster management authorities to focus on the
continued capacity-building of district disaster management authorities and CSOs that are responsible for managing disaster risk. Capacity-building should support the planning and implementation of actions across the full disaster management cycle.

- There is a need to revise the SDMPs to include a much greater emphasis on risk reduction, rather than just preparedness and response.
- Existing rules and regulations that impede the inclusion of measures for risk reduction need to be amended.
- Build partnerships with and draw lessons from forerunner states such as Bihar and Gujarat on how to include risk reduction in plans more effectively.
- Accountability mechanisms need to be specified. This will ensure that departments follow disaster risk-reduction considerations in their own development planning.
- There is an urgent need to put the National Disaster Mitigation Fund and state disaster management funds into operation. States such as Bihar, which are leading in this regard, should share lessons on how to realise this at the state level.
- States should