Disaster Management in India

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ABSTRACT: Disruption on a massive scale, either natural or man-made, occurring in short or long periods is termed a Disaster. Disaster management in India has been an important point of discussion owing to frequent natural disasters ranging from earthquakes, floods, drought, etc. Loss of life and property due to these disasters has been steadily mounting throughout the world due to inadequate technology to combat disasters, rise in population, climate change, and continuing ecological degradation. The global efforts to manage disasters have proven to be insufficient to match the frequency and magnitude of natural disasters.

KEYWORDS- disaster, management, India, man-made, natural, disruption

I.INTRODUCTION

A disaster is defined as a disruption on a massive scale, either natural or man-made, occurring in short or long periods. 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.[1,2,3]

Disasters can be classified into the following categories:

- Water and Climate Disaster: Flood, hail storms, cloudburst, cyclones, heat waves, cold waves, droughts, hurricanes. (Read about Cyclone Disaster Management separately at the linked article.)
- 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?

In this section, we define what is disaster management as per the Disaster Management Act of 2005.

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[4,5,6]
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.

Biological Disasters

Definition: The devastating effects caused by an enormous spread of a certain kind of living organism that may spread disease, viruses, or an infestation of plant, animal, or insect life on an epidemic or pandemic level.

1. Epidemic Level – Indicates a disaster that affects many people in a given area or community.
2. Pandemic Level – Indicates a disaster that affects a much larger region, sometimes an entire continent or even the whole planet. For example, the recent H1N1 or Swine Flu pandemic.

To know more about Bio-Terrorism threat to India and India's Preparedness visit the linked article.

Biological Disasters – Important points to remember for UPSC

1. The nodal Ministry for handling epidemics – Ministry of Health and Family Welfare

- Decision-making
- Advisory body
- Emergency medical relief providing

2. The primary responsibility of dealing with biological disasters is with the State Governments. (Reason – Health is a State Subject).

3. The nodal agency for investigating outbreaks – National Institute of Communicable Diseases (NICD)[7,8,9]

4. Nodal ministry for Biological Warfare – Ministry of Home Affairs (Biological warfare is the use of biological agents as an act of war)

Biological Disasters – Classifications

Charles Baldwin developed the symbol for biohazard in 1966.

The US Centres for Disease Control classifies biohazards into four biosafety levels as follows:

1. BSL-1: Bacteria and Viruses including Bacillus subtilis, some cell cultures, canine hepatitis, and non-infectious bacteria. Protection is only facial protection and gloves.
2. BSL-2: Bacteria and viruses that cause only mild disease to humans, or are difficult to contract via aerosol in a lab setting such as hepatitis A, B, C, mumps, measles, HIV, etc. Protection – use of autoclaves for sterilizing and biological safety cabinets.
3. BSL-3: Bacteria and viruses causing severe to fatal disease in humans. Example: West Nile virus, anthrax, MERS coronavirus. Protection – Stringent safety protocols such as the use of respirators to prevent airborne infection.
4. BSL-4: Potentially fatal (to human beings) viruses like Ebola virus, Marburg virus, Lassa fever virus, etc. Protection – use of a positive pressure personnel suit, with a segregated air supply.

Legislations for prevention of Biohazards in India[10,11,12]

The following legislations have been enacted in India for the prevention of biohazards and implementation of protective, eradicative and containing measures when there is an outbreak:

1. The Water (Prevention and Control of Pollution) Act, 1974
2. The Air (Prevention and Control of Pollution) Act, 1981
3. The Environmental (Protection) Act, 1986 and the Rules (1986)
4. Disaster Management Act 2005, provides for the institutional and operational framework for disaster prevention, mitigation, response, preparedness, and recovery at all levels.

II.DISCUSSION

Prevention of Biological Hazards

The basic measure to prevent and control biohazards is the elimination of the source of contamination. Some of the prevention methods are as follows:

Preventive Measures for workers in the field (Medical)

1. Engineering controls – to help prevent the spread of such disasters including proper ventilation, installing negative pressure, and usage of UV lamps.
2. Personal hygiene – washing hands with liquid soap, proper care for clothes that have been exposed to a probably contaminated environment.
3. Personal protection equipment – masks, protective clothing, gloves, face shield, eye shield, shoe covers.

4. Sterilization – Using ultra heat or high pressure to eliminate bacteria or using biocide to kill microbes.
5. Respiratory protection – surgical masks, respirators, powered air-purifying respirators (PAPR), air-supplying respirators.

Prevention of Biological Hazards (Environmental Management)

Safe water supply, proper maintenance of sewage pipelines – to prevent waterborne diseases such as cholera, typhoid, hepatitis, dysentery, etc.

Awareness of personal hygiene and provision for washing, cleaning, bathing, avoiding overcrowding, etc.

Vector control:

Environmental engineering work and generic integrated vector control measures.

Water management, not permitting water to stagnate and collect and other methods to eliminate breeding places for vectors.

Regular spraying of insecticides, outdoor fogging, etc. for controlling vectors.

Controlling the population of rodents.

Post-disaster Epidemics Prevention

The risk of epidemics is increased after any biological disaster.

Integrated Disease Surveillance Systems (IDSS) monitors the sources, modes of diseases spreading, and investigates the epidemics.

Detection and Containment of Outbreaks

This consists of four steps as given under:

1. Recognizing and diagnosing by primary healthcare practitioners.
2. Communicating surveillance information to public health authorities.
3. Epidemiological analysis of surveillance data
4. Public health measures and delivering proper medical treatment.

Legal Framework for Biological Disasters

1. The Epidemic Diseases Act was enacted in the year 1897. (Read about RSTV's In-Depth Analysis on Epidemic Diseases Act 1897 in the linked article.)
2. This Act does not provide any power to the centre to intervene in biological emergencies.
3. It has to be substituted by an Act that takes care of the prevailing and foreseeable public health needs including emergencies such as BT attacks and the use of biological weapons by an adversary, cross-border issues, and international spread of diseases.[13,14]
4. It should give enough powers to the central and state governments and local authorities to act with impunity, notify affected areas, restrict movement or quarantine the affected area, enter any premises to take samples of suspected materials, and seal them.
5. The Act should also establish controls over biological sample transfer, biosecurity and biosafety of materials/laboratories.

Institutional Framework

In the Ministry of Health & Family Welfare (MoH&FW), public health needs to be accorded high priority with a separate Additional Directorate General of Health and Sanitation (DGHS) for public health. In some states, there is a separate

department of public health. States that do not have such arrangements will also have to take initiatives to establish such a department.

Operational Framework

At the national level, there is no policy on biological disasters. The existing contingency plan of MoH&FW is about 10 years old and needs extensive revision. All components related to public health, namely apex institutions, field epidemiology, surveillance, teaching, training, research, etc., need to be strengthened.

At the operational level, Command and Control (C&C) are identifiable clearly at the district level, where the district collector is vested with certain powers to requisition resources, notify a disease, inspect any premises, seek help from the Army, state or centre, enforce quarantine, etc. However, there is no concept of an incident command system wherein the entire action is brought under the ambit of an incident commander with support from the disciplines of logistics, finance, and technical teams, etc. There is an urgent need for establishing an incident command system in every district.

There is a shortage of medical and paramedical staff at the district and sub-district levels. There is also an acute shortage of public health specialists, epidemiologists, clinical microbiologists, and virologists.

Biosafety laboratories are required for the prompt diagnosis of the agents for the effective management of biological disasters. There is no BSL-4 laboratory in the human health sector. BSL-3 laboratories are also limited. Major issues remain regarding biosecurity, the indigenous capability of preparing diagnostic reagents, and quality assurance.

Lack of an Integrated Ambulance Network (IAN). There is no ambulance system with advanced life-support facilities that are capable of working in biological disasters.

State-run hospitals have limited medical supplies. Even in normal situations, a patient has to buy medicines. There is a lack of stockpile of drugs, important vaccines like anthrax vaccine, PPE, or diagnostics for surge capacity. In a crisis, there is further incapacitation due to tedious procurement procedures.

National Disaster Response Force (NDRF):- The command and supervision of the NDRF would be under the Director-General of Civil Defence and National Disaster Response Force selected by the Central Government. Currently, the NDRF comprises of eight battalions who will be positioned at different locations as per the requirements.

III.RESULTS

Disaster Prevention and Mitigation

Proper planning and mitigation measures can play a leading role in risk-prone areas to minimize the worst effects of hazards such as earthquakes, floods, and cyclones. These are the key areas which should be addressed to achieve this objective:

- Risk Assessment and Vulnerability Mapping: Mapping and vulnerability analysis in a multi-risk structure will be conducted utilizing Geographic Information System (GIS) based databases like the National Database for Emergency Management (NDEM) and National Spatial Data Infrastructure (NSDI).
- Increasing Trend of Disasters in Urban Areas:- Steps to prevent unplanned urbanization must be undertaken, with the plan of action formulated being given the highest priority. State Governments/UTs concerned on the other hand focus on urban drainage systems with special attention on non-obstruction of natural drainage systems.
- Critical Infrastructure:- Critical infrastructure like roads, dams, bridges, irrigation canals, bridges, power stations, railway lines, delta water distribution networks, ports and rivers, and coastal embankments should be continuously checked for safety standards concerning worldwide safety benchmarks and fortified if the current measures prove to be inadequate.
- Environmentally Sustainable Development:– Environmental considerations and developmental efforts, should be handled simultaneously for ensuring sustainability.
- Climate Change Adaptation:-. The challenges of the increase in the frequency and intensity of natural disasters like cyclones, floods, and droughts should be tackled in a sustained and effective manner with the promotion of strategies for climate change adaptation and disaster risk reduction.
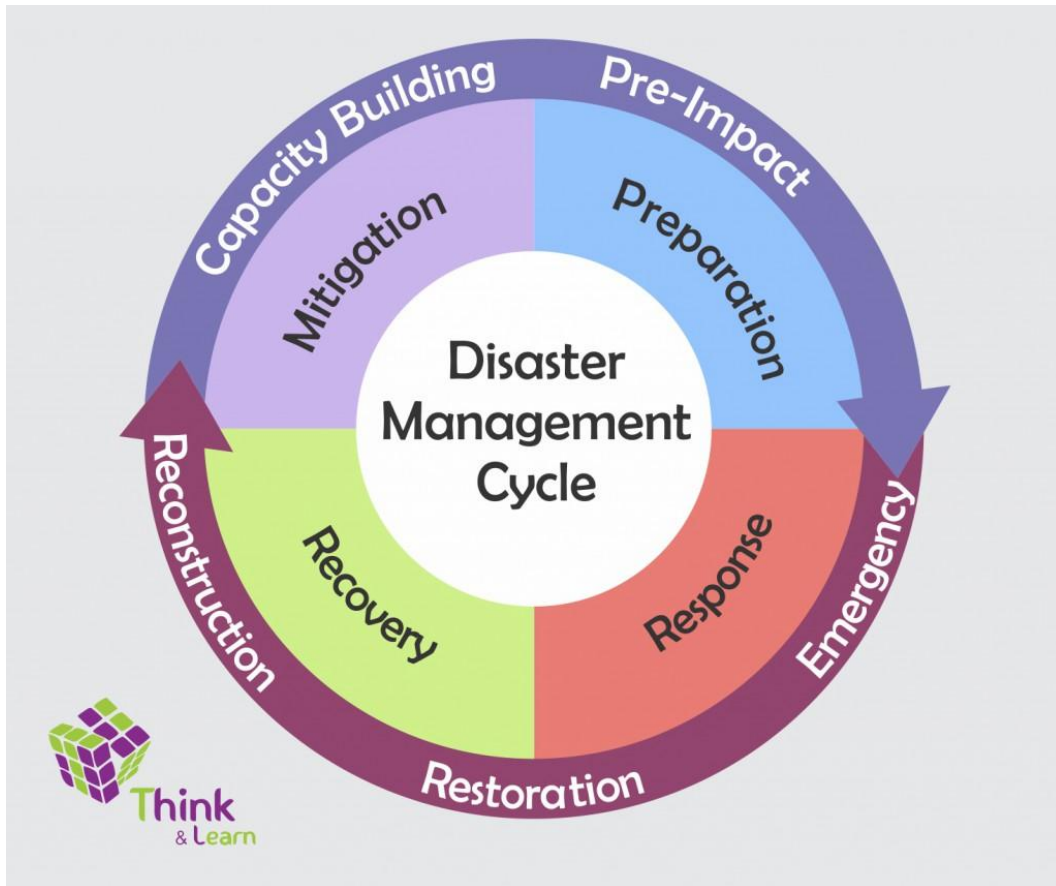
Disaster management in India — policies, laws, routines, and courses-of-action to aid in the conservation and recovery of lives and property during a natural or man-made disaster. Disaster management plans are multi-layered, and are planned to address issues such as floods, hurricanes/cyclones, fire, mass failure of utilities (blackouts) and the rapid spread of disease (pandemic).

From a meteorological standpoint, India is especially vulnerable to natural disasters due to its unique location below the Himalayas (facing the open Indian Ocean) as well as its geo-climatic conditions and varied landscapes; monsoons, subsequent landslides and floods, droughts, famine, wildfires, cyclones, and earthquakes are all experienced to varying degrees on the Subcontinent, in addition to areas of dense overpopulation being at greater risk for disease outbreak and sanitation concerns, in the event of a natural disaster.[15,16]

Due to this vastness of the country, different regions are vulnerable to different natural disasters. For example, during monsoon season, it is the peninsular regions of South India that are generally most affected, as well as by cyclone or tsunami; the more temperate to arid states of western India risk severe drought, famine and/or wildfire during summer. The more remote, mountainous regions of the North, especially the Himalayan states, can experience devastating avalanches in winter, spring flooding and major landslides during wet periods. This is in addition to earthquakes which, in the mountains, bring the potential for increased devastation due to falling rocks, mudslides, and flash floods.

Overview

The new approach started from the conviction that development cannot be sustained unless mitigation is built into the development process. Another cornerstone of the approach is that mitigation must be multi-disciplinary, spanning across all sectors of development.The new policy also emanates from the belief that investments in mitigation are much more cost effective than expenditure on relief and rehabilitation. Disaster management occupies an important place in India's policy framework, as poor people are most affected by disaster and they are India's predominant population.

The steps being taken by the Government emanate from the approach,has been outlined above. The approach has been translated into a National Disaster Framework (a roadmap) covering institutional mechanisms, disaster prevention strategy, early warning systems, disaster mitigation, preparedness and response and human resource development. The

expected inputs, areas of intervention and agencies to be involved at the National, State and district levels have been identified and listed in the roadmap. This roadmap has been shared with all the State Governments and Union Territory Administrations. Ministries and Departments of the Government of India and the State Governments/Union Territory Administrations have been advised to develop their respective roadmaps taking the national roadmap as a broad guideline. There is, therefore, now a common strategy underpinning the action being taken by all the participating organisations/stakeholders.

The Disaster Management Act, 2005

The Disaster Management Act was passed by the Lok Sabha on 28 November 2005, and by the Rajya Sabha on 12 December 2005. It received the assent of the President of India on 9 January 2006. The Act calls for the establishment of a National Disaster Management Authority (NDMA), with the Prime Minister of India as chairperson. The NDMA has no more than nine members at a time, including a Vice-Chairperson. The tenure of the members of the NDMA is 5 years. The NDMA which was initially established on 30 May 2005 by an executive order, was constituted under Section-3(1) of the Disaster Management Act, on 27 September 2005. The NDMA is responsible for "laying down the policies, plans and guidelines for disaster management" and to ensure very timely and effective response to disaster". Under section 6 of the Act it is responsible for laying "down guidelines to be followed by the State Authorities in drawing up the country Plans".

Disaster Management Plan

On 1 June 2016, Narendra Modi, the Prime Minister of India, launched the Disaster Management Plan of India, which seeks to provide a frame work and direction to government agencies for prevention, mitigation and management of disasters. This is the first plan nationally since the enactment of the Disaster Management Act of 2005.[1]

About the Authority

National Disaster Management Authority (NDMA) is an agency of the Ministry of Home Affairs whose primary purpose is to coordinate response to natural or man-made disasters and for capacity-building in disaster resiliency and crisis response.[2] NDMA was established through the Disaster Management Act enacted by the Government of India in December 2005.[3] The Prime Minister is the ex-officio chairperson of NDMA. The agency is responsible for framing policies, laying down guidelines and best-practices and coordinating with the State Disaster Management Authorities (SDMAs) management.[4]

IV.CONCLUSION

The National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the apex body for Disaster Management in India. Setting up of NDMA and the creation of an enabling environment for institutional mechanisms at the State and District levels is mandated by the Disaster Management Act, 2005. NDMA is mandated to lay down the policies, plans and guidelines for Disaster Management. India envisions the development of an ethos of Prevention, Mitigation, Preparedness and Response.

The Indian government strives to promote a national resolve to mitigate the damage and destruction caused by natural and man-made disasters, through sustained and collective efforts of all Government agencies, Non-Governmental Organizations and People's participation. This is planned to be accomplished by adopting a Technology-Driven, Pro-Active, Multi-Hazard and Multi-Sectoral strategy for building a Safer, Disaster Resilient and Dynamic India.

The NDMA Logo reflects the aspirations of this National Vision, of empowering all stakeholders to improve the effectiveness of Disaster Management in India. NDMA has 5 major divisions viz. Policy & Plans, Mitigation , Operations & Communications & Information & Technology , Administration and Finance.[16]

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