Disaster

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. Disasters can be classified into the following categories:

1. **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.)
2. **Geological Disaster:** Landslides, earthquakes, volcanic eruptions, tornadoes
3. **Biological Disaster:** Viral epidemics, pest attacks, cattle epidemic, and locust plagues
4. **Industrial Disaster:** Chemical and industrial accidents, mine shaft fires, oil spills,
5. **Nuclear Disasters:** Nuclear core meltdowns, radiation poisoning
6. **Man-made disasters:** Urban and forest fires, oil spill, the collapse of huge building structures

Disaster Management- 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

a. **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).
b. **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.

c. **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.

d. **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.

e. **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)

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- Disaster management is a process of preparing an effective response to disasters. It involves organizing resources to allocate them strategically in order to lessen the devastations caused by disasters.

Disaster management itself has many concepts that one must be familiar with. What those concepts are will be discussed at length in this article. The information gained from this article will be useful in the UPSC Mains Exam

The candidates can read more related information from the links provided below:

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Types of Disasters

The basic concepts of disaster management begins with understanding the type of disasters known to humankind. Some of them are as follows:

1. **Natural Disasters:** As per standard definition, natural disasters are physical phenomena that occur naturally caused by rapid or slow events that will impact human health and cause economic damage. Some examples of these disasters are

- Earthquakes
- Avalanches and Floods
- Droughts and Wildfires
- Cyclones, Storms
- Diseases and Animal Plagues. As per the United Nations Office for Disaster Risk Reduction, disasters are characterized as per the magnitude, intensity, speed and duration.

2. **Man Made Disasters:** Man-Made Disasters, as per the definition by the International Federation of Red Cross and Red Crescent Societies, are events caused by humans which occur close to

settlements and are equal in scope to damage and devastation in comparison to natural disasters. Some example of man made disasters are as follows:

- Environment Degradation
- Industrial disasters (Involving the production, use or transport of hazardous materials)
- Pollution

3. **Complex Disasters:** Some disasters are the result of a variety of hazards and often lead to a combination of both natural and man-made disasters. Its can result in lootings, breakdown of authority and include situations such as wars.

The examples of complex disasters are:

- Food Insecurity
- Epidemics
- Armed Conflicts
- Displaced Populations

Characteristics of complex disasters are as follows

- Extensive Violence
- Displacements of Populations
- Loss of Life
- Widespread Damage to both Societies and Economies
- Increased Security Risks for Humanitarian Relief Workers

4. **Pandemic Disasters:** A pandemic is an epidemic of infectious disease that has spread around in the entirety of a region. This can occur to the human population or even animal populations and will lead to a disruption in economic and social conditions of a country, to say nothing of the health of a populace. This may result naturally or sometimes be a result of man made causes.

It can also refer to the appearance of a significant number of cases of an infectious disease in a region or population that is usually free from that disease.

These have included the following epidemic:

- Ebola
- Zika
- Avian Flu
- Cholera
- Dengue Fever
- Malaria
- Coronavirus Disease (COVID-19)

Concepts of Disaster Management:

Now that we are familiar with the type of disasters at hand, we can now take a look at the concepts related to disaster management. They are as follows:

1. Prevention
2. Preparedness
3. Response/Relief
4. Recovery

1. Prevention: UNISDR views Disaster Prevention as the concept of engaging in activities which intend to prevent or avoid potential adverse impacts through action taken in advance, activities designed to provide protection from the occurrence of disasters

2. Preparedness: According to ICRC, Disaster Preparedness refers to measures taken to prepare for and reduce the effects of disasters, be they natural or man-made. This is achieved through research and planning in order to try to predict areas or regions that may be at risk of disaster and where possible prevent these from occurring and/or reduce the impact of those disasters on the vulnerable populations that may be affected so they can effectively cope.

Disaster preparedness activities embedded with risk reduction measures can prevent disaster situations and also result in saving maximum lives and livelihoods during any disaster situation, enabling the affected population to get back to normalcy within a short time period

3. Response/ Relief: Focused predominantly on immediate and short-term needs, the division between this response/relief stage and the subsequent recovery stage is not clear-cut. Some response actions, such as the supply of temporary housing and water supplies, may extend well into the recovery stage. Rescue from immediate danger and stabilization of the physical and emotional condition of survivors is the primary aim of disaster response/relief.

Activities of Response/ Relief include:

- Rescue
- Relocation
- Provision Food and Water
- Provision Emergency Health Care
- Prevention of Disease and Disability
- Repairing Vital Services e.g. Telecommunications, Transport
- Provision Temporary Shelter

4. Recovery: Vulnerability of communities often continues for long after the initial crisis is over. It include the following activities

- Rebuilding Infrastructure e.g. Homes, Schools, Hospitals, Roads
- Health Care and Rehabilitation
- Development Activities e.g. building human resources for health
- Development Policies and Practices to avoid or mitigate similar situations in future

What-are-the-main-disaster-management-concepts?"

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What-are-the-main-disaster-management-concepts?"

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

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.

Read:

- Air Prevention and Control of Pollution Act 1981
- Disaster Management Act of 2005

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.
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 center, 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.

Read about Crowd Disaster Management in the linked article.

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 river, 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.


Capacity Building
Pre-Impa
Mitigation
Preparation
Disaster Management Cycle
Reconstruction
Recovery
Response
Restoration
Think & Learn

The topics of internal security and disaster management are diverse and also important for both the prelims and the mains exams. These topics are also highly linked with current affairs. Almost every question asked from them is related to current events. So, apart from standard textbooks, you should rely on newspapers and news analyses as well for these sections. To read on how to prepare for internal security and disaster management, check the linked article.