

# Disaster Management

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## **Abstract**

Disasters are a matter of global concern. The death toll from natural disasters is about 250,000 per year. In India too, loss of life due to floods and earthquakes is considerably high. The term disaster refers to a natural or a man made event in combination with its damaging effects, which results in affecting a number of people large enough to disrupt the normal course of emergency and healthcare services. The common denominators are hazard, risk and vulnerability. A large number of classifications are available based on origin/ cause, whether natural or man made. Disaster planning cannot prevent disasters but the effects can be minimized by appropriate plans and preparedness. Disaster management is an intensive exercise involving inputs from local, national and international sources, requiring coordination in the management of a disaster preparedness plan and public participation in restoring normalcy with good speed.

*Key words:* Disaster management, natural disasters, man made disasters, disaster response, disaster prediction.

## **Introduction**

Disasters are common occurrences all over the world. India is no exception;

floods affect over nine million hectares annually. Fifty six percent of land mass is vulnerable to seismic activity of

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varying degrees and 5700 km of coastline is prone to severe cyclones, with extensive damage of life and habitat. The economic loss is considerable and rehabilitation even more costly. Besides natural disasters we also have man made disasters like transport accidents, railway accidents, social tensions and bomb blasts.

Globally the toll of death and damages in natural disasters is increasing and the cost to global economy is estimated to be 50 billion US dollars per year. One-third of the cost is for predicting, prevention and mitigating whereas two-thirds of the cost is due to direct damage. A death toll globally is about 2.5 lakh patients per year. Even in India loss of life due to floods, earthquakes is considerably high leading to a mechanical disaster.

The word disaster is French in origin, being derived from two words, "des" (meaning bad or evil) and "aster" (meaning star), literally meaning "bad or evil star".

The disasters have been defined in various ways on the basis of degree of physical impact of the event, magnitude, disruption of public safety, disproportion of resources and in terms of special efforts required.

#### **Definitions:**

**World Health Organization (WHO):** Sudden ecologic phenomenon

of sufficient magnitude to require external existence.

**American College of Emergency Physicians (ACEP):** Any community or regional event that disrupts community functions and activities and threatens or causes concern for the lives, health and property of the citizens.

**Humberside County Council, UK:** Major incident arising with little or no warning causing or threatening death or serious injury to or rendering homeless, such numbers of persons in excess of those which can be dealt with by the public services operating under normal procedures and which calls for the special mobilization and organization of these services.

In common parlance disaster means disruption of such magnitude that organization, infrastructure and resources are overwhelmed. Destruction is so large that it exceeds the capacity of a community to adjust and requires assistance from outside. As per the Disaster Management Act 2005, 'Disaster' means a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or man made causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, or destruction of property, or damage to, or degradation of environment, and

is of such a nature or magnitude as to be beyond the coping capacity of the community of the affected area.

Generally speaking the term disaster refers to a natural or a man made event in combination with its damaging effects, which results in a number large enough to disrupt the normal course of emergency and healthcare services.

### **The Common Denominators are hazard, risk and vulnerability**

Hazard refers to the natural event itself. Risk refers to the probability that a particular system/ population will be affected by hazards. Vulnerability refers to the susceptibility of a population/ system to the effects of the hazard.

### **Classifying Disasters**

A large number of classifications are available based on origin/ cause whether natural or man made. They could also be based on the source or on the onset or on the anticipatory response.

### **Classification Based on Origin/ Cause**

The classification based on origin or cause can be a natural disaster like earthquake, Tsunami, volcanic eruption or it can be due to natural phenomena on earth surface like landslides and avalanches. Other classifications based on origin or the cause could be due to natural disasters like cyclones,

typhoons, hurricanes, hailstorms, sandstorms, floods, and droughts. It could also be biological in term of epidemics and locust invasion.

Disaster could also be classified on the basis of man made disasters like those caused by warfare, civil disturbances (riots and demonstrations) or caused by accidents like drowning, building collapse, explosion etc and vehicular accidents. Other classification could be based on the source – metereological (storms, hurricanes, cyclones, droughts, cold spells), topological (floods, landslides and avalanches), telluric and tectonic (earthquakes, volcanic eruptions) and accidents (explosions, fires).

### **Classification Based on Response**

**Level 1:** Local emergency response personnel/ organization are able to contain & respond effectively.

**Level 2:** Requires regional efforts and aid from surrounding country/ community.

**Level 3:** Local resources overwhelmed; Needs international assistance/ aid.

### **Various authors have described the response of disaster:**

Powell & Rayner Model (1952) describes disaster as a series of temporal stages. It proposes a set of

processes by which an occurrence is defined as a disaster:

- Stage 0 – Pre Disaster Scenario
- Stage 1 – Warning Phase
- Stage 2 – Threat Phase
- Stage 3 – Impact Phase
- Stage 4 – Inventory Phase
- Stage 5 – Rescue Phase
- Stage 6 – Remedy Phase
- Stage 7 – Recovery Phase

Skeet (1977) suggested five phases of disaster:

1. Warning phase
2. Period of Impact
3. Rescue phase
4. Relief phase
5. Rehabilitation phase

The phases of disaster could have also been described as:

1. Inter-disaster period.
2. Pre-impact stage.
3. Disaster phase – Disaster strikes the community and can have the following phases: stage of isolation, rescue, relief, phases of temporary shelter and stage of rehabilitation.

### **Process of disaster**

The geographic divisions of area concerned with disaster were conceived

in order to classify the arising problems and to help manage them. Three major divisions in vogue are, impact area, filter area and community aid area; *impact area* is where disaster has struck causing damage; *filter area* is undamaged zone surrounding the impact area from where immediate aid by community starts; the *community aid area* is immediately outside the filter area from where the organized rescue and relief flows.

### **Principles of disaster planning**

Disaster Management means a planned and systematic approach towards understanding and solving problems in the wake of disasters. The disaster planning cannot prevent disasters but its effects could be minimized by appropriate plans and preparedness. Some of the general principles of disaster planning are universal and can be applied in all the situations. The foremost requirement is that it should be a continuous process, it should reduce the unknown in a problematic situation, and it should be based on valid knowledge. Other important facts are that it should evoke appropriate action, focus on general principles, and it must be tested. The disaster plans and preparedness to deal with disaster situation are necessary for every community particularly the health care system with its critical component, the hospitals which are to

be prepared consistently to mobilize all their facilities for maximum use. Realistic, well-rehearsed and properly coordinated disaster plan executed by well-trained system is essential to meet the challenge of disasters. The key issues in disaster management are communication, coordination and control. Important issues in predisaster management are prediction, prevention, planning and preparedness. The critical issue when disaster event occurs is the immediate response, rescue, relief and rehabilitation.

### **Disaster Management**

Disaster has been conceptualized as a process with different temporal phases, where different information and action is required. The disaster management can be divided into 5 phases.

The basis of disaster management is *disaster prevention*, *disaster mitigation* (that is warning systems, evacuation plans etc.) and *disaster preparedness*. This is followed by *recovery phase* which is the process by which the community is assisted in returning to the level of functioning prior to the disaster. The best response of the disaster management is by way of disaster measures taken prior to, during and following the disaster, with an aim to save life, to protect property and the immediate damage caused by the disaster.

The activation of *disaster response* is by warning, notification, organization of command and scene assessment, which is followed by implementation (search and rescue, extrication, triage, stabilisation and transportation).

In other words it actually entails taking control and management of scene of disaster. Ultimately the management also includes reconstruction and rehabilitation and entails returning the community to the level prior to the disaster.

### **Disaster Response**

Disaster response can be local/regional, national or even international. The local response can be provided by the state administration, local government, NGOs and from the local community itself.

The national response depends upon the policy and resource availability within the country. Disaster prone nations, where disasters are common, have designated task forces, expert teams and disaster management committees to outline the responsibility as well as the resources needed for mitigation of the disaster.

International organizations have also been of help in the immediate aftermath of the disaster by providing supplies and equipments relating to communication, generators, food, clothing as well as shelters.

The essentials of disaster management are clear cut disaster management policies, adequate legislation, describing the responsibilities of the relief organization and preparedness. The preparedness and response depend upon risk and hazard assessment and a having vulnerability analysis. Technology plays a major role in data collection, assessment and development of hazard maps (1).

The other parameters of disaster management are disaster prediction and warning. These depend upon the meteorological, hydrological and seismological data providing warning of cyclone and floods in the coastal areas and the use of modern sophisticated techniques like aerial photography, satellite imaging and other remote sensing systems (2).

The other essential aspects of disaster management are awareness of the resource plans and training of manpower in managerial, technical and coordination skills. Finally, essentials of disaster management should also include public awareness and education and conducting periodic disaster drills at the local, district and state levels.

## **Disaster management in India**

### **Overview**

The contingency action plan for natural calamities was mooted by ministry of agriculture in India in 1990. It was a brief policy statement and

response plan. It was mainly relief oriented. The mitigation and preparedness was not given much importance. In 2001 National Disaster Commission was constituted after the earthquake in Gujarat on 26<sup>th</sup> January, 2001. The National Disaster policy was outlined which emphasized the need for creation of a separate body for designing, implementation and development of National Disaster Management plan (3). It was envisaged that in disaster management the responsibility would be shared between the centre and the states wherein state would provide basic responsibility of relief and rescue and the centre would play a supportive role providing information, financial, technical and material support. The National Disaster Management Authority (NDMA), established in 2005, is headed by the Prime Minister. The NDMA has the following responsibilities:

1. Lay down policies on disaster management;
2. Approve the National Plan;
3. Approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan;
4. Lay down guidelines to be followed by the State Authorities in drawing up the State Plan;
5. Lay down guidelines to be followed by the different Ministries or

Departments of the Government of India.

6. Coordinate the enforcement and implementation of the policy and plan for disaster management;
7. Provide support to other countries affected by major disasters.
8. Take measures for the prevention of disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster.
9. Lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management.

Under this the National Disaster Response Force was established with a multidisciplinary high tech skilled force to deal with all types of disasters. Under

this scheme eight battalions were formed from different organizations i.e., Border Security Force (BSF), Central Reserve Police Force (CRPF), Central Industrial Security Force (CISF) and Indo Tibetan Border Police Force (ITBP).

National Institute of Disaster Management (NIDM) was established as the centre for human resource development in the areas of disaster mitigation and response for training, research, data collection, capacity development and documentation. There has been a *paradigm shift* in the management of disaster from relief orientation to preparedness.

The various ministerial responsibilities have been identified for different types of disasters as given in Table 1.

-	Earthquakes and Tsunami	Ministry of Home Affairs (MHA)/ Ministry of Earth Sciences/ Indian Meteorological Department (IMD)
-	Floods	MHA/ Ministry of Water Resources/ Central Water Commission (CWC)
-	Cyclones	MHA/ Ministry of Earth Sciences/IMD
-	Drought	Ministry of Agriculture
-	Biological Disasters	Ministry of Health and Family Welfare
-	Chemical Disasters	Ministry of Environment & Forests
-	Nuclear Disasters	Ministry of Atomic Energy
-	Air Accidents	Ministry of Civil Aviation
-	Railway Accidents	Ministry of Railways

The impact on hospitals in case of disasters can be direct or indirect. In case of a natural disaster the hospitals and their services can be severely affected if the hospital lies in the direct impact area and the health infrastructure can be damaged. In case of a man made disaster like bomb blast, the hospitals are not affected and they can play a stellar role in management of the disaster. The indirect impact of hospitals during the disaster can be requirement of networking of the hospitals, sending rescue teams to the

impact areas and the various measures for improvisation like operation theatres, emergency rooms and training for mechanical, biological and nuclear warfare.

In conclusion, it needs to be reiterated that disaster management is an intensive exercise involving inputs from all sources – local, national and international, requiring coordination in the management for a disaster preparedness plan and involvement of the public in participation and restoring normalcy with good speed.

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