

CHAPTER 2

INTRODUCTION TO DISASTERS AND DISASTER MANAGEMENT SYSTEM IN INDIA

2.1 Disasters are as old as human history but the dramatic increase and the damage caused by them in the recent past have become a cause of national and international concern. Over the past decade, the number of natural and manmade disasters has increased considerably. From the year 1994 to 1998, the number of disasters reported on an average was 428 per year. This however increased from 1999 to 2003, this figure went up to an average of 707 disaster events per year showing an increase of about 60 per cent over the previous block of four years. The biggest rise was in developing or countries with low human development, which witnessed an increase of 142 per cent. **Fig 1** gives the world wide figure for deaths reported from various disasters in percentage for period 1992-2001 and **Table 1** illustrates major disasters in India from 1970-2001.

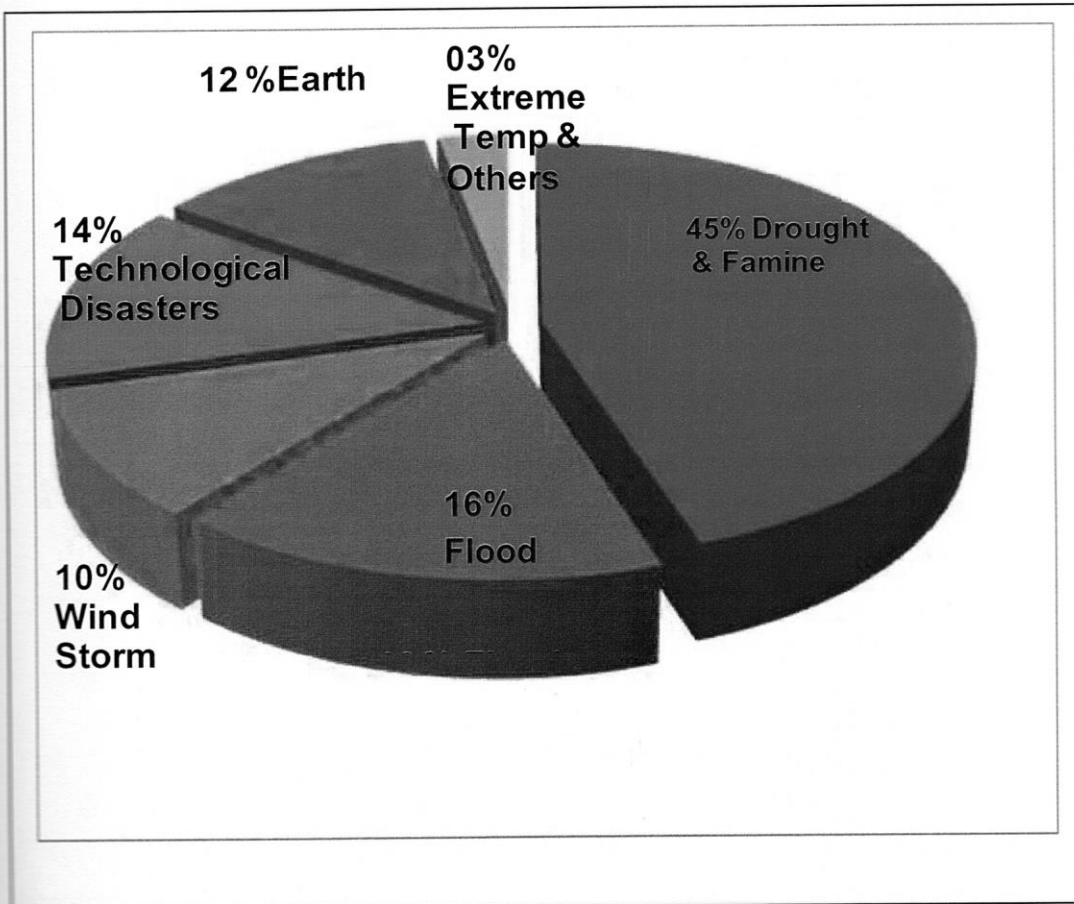


Figure1: Reported Deaths world over from Various Disasters(1992-2001)

Source: World Disaster Report 2001

<u>SI No</u>	<u>Disaster</u>	<u>Impact</u>
	<u>CYCLONE</u>	
1	29 th October 1971, Orissa	Cyclone and tidal waves killed 10,000 people
2	19 th November, 1977, Andhra Pradesh	Cyclone and tidal waves killed 20,000 people
	<u>EARTHQUAKE</u>	
4	20 th October 1991 Uttarkashi.	An earthquake of magnitude 6.6 killed 723 people
5	30 th September 1993 Latur	Approximately 8000 people died and there was a heavy loss to infrastructure
6	22 May 1997 Jabalpur	39 people dead.
7	29 th March 1997, Chamoli	100 people dead
8	26 th January, 2001, Bhuj, Gujarat	More than 10,000 dead and heavy loss to infrastructure

<u>SI No</u>	<u>Disaster</u>	<u>Impact</u>
	<u>Landslide</u>	
9	Jul 1991, Assam.	300 people killed, heavy loss to roads and infrastructure
10	August 1993, Nagaland	500 killed and more than 200 houses destroyed and about 5kms. Road damaged.
11	18 th August 1998, Malpa	210 people killed. Villages were washed away
	<u>Flood</u>	
12	1978 Floods in North East India	3,800 people killed and heavy loss to property.
13	1994 Floods in Assam, Arunachal Pradesh, Jammu and Kashmir, Himachal Pradesh, Panjab, Uttar Pradesh, Goa, Kerala and Gujarat	More than 2000 people killed and thousands affected

Table 1: Major disasters in India since 1970-2001.

Source: World Disaster Report 2001

Table 1, above, shows a list of some of the major disasters which have caused colossal impact in India, for the period 1970-2001.

2.2 Natural Hazards & Disaster Management

2.2.1 Disaster. In India, 59 per cent of the land mass is susceptible to seismic hazard; 5 percent of the total geographical area is prone to floods; 8 per cent of the total landmass is prone to cyclones; 70 per cent of the total cultivable area is vulnerable to drought. A disaster can be defined as "A serious disruption in the functioning of the community or a society causing wide spread material, economic, social or environmental losses which exceed the ability of the affected society to cope using its own resources". As per DM Act 2005, Disaster can be defined as a catastrophe, mishap, calamity or grave occurrence in any area, arising from natural or manmade causes, or by accident or negligence which results in substantial loss of life or human suffering or damage to, and 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.

2.2.2 Hazard Hazard may be defined as "a dangerous condition or event, that threaten or have the potential for causing injury to life or damage to property or the environment." The word 'hazard' owes its origin to the word *hasard* in old French and *'az-zahr'* in Arabic meaning 'chance' or 'luck'. Hazards can be grouped into two broad categories namely natural and manmade.

(a) Natural hazards. Hazards which are caused because of natural phenomena (hazards with meteorological, geological or even biological origin). Examples of natural hazards are cyclones, Tsunamis, earthquake and volcanic eruption which are exclusively of natural origin.

(b) Manmade hazards. Hazards which are due to human negligence. Manmade hazards are associated with industries or energy

generation facilities and include explosions, leakage of toxic waste, pollution, dam failure, wars or civil strife etc.

2.2.3 **Disaster Management.** Disaster management covers the range of activities designed to maintain control over disasters/emergency situations and to provide a framework for helping to avoid, reduce the effect of or recover from impact of disaster. These activities may be related to preparedness, mitigation, emergency response, relief and recovery (reconstruction and rehabilitation). It may be conducted before, during or after a disaster.

2.4 **Disaster Mitigation, Prevention and Preparedness.**

1. **Preparedness.** This protective process embraces measures which enable governments, communities and individuals to respond rapidly to disaster situations to cope with them effectively. Preparedness includes the formulation of viable emergency plans, the development of warning systems, the maintenance of inventories and the training of personnel. It may also embrace search and rescue measures as well as evacuation plans for areas that may be at risk from a recurring disaster. Preparedness therefore encompasses those measures taken before a disaster event which are aimed at minimising loss of life, disruption of critical services, and damage when the disaster occurs.

2. **Mitigation.** Mitigation embraces measures taken to reduce both the effect of the hazard and the vulnerable conditions to it in order to reduce the scale of a future disaster. Therefore mitigation activities can be focused on the hazard itself or the elements exposed to the threat. Examples of mitigation measures which are hazard specific include water management in drought prone areas, relocating people away from the hazard prone areas and by strengthening structures to reduce damage when a hazard occurs. In addition to these physical measures, mitigation should also aim at reducing the economic and social vulnerabilities of potential disasters.

Box 1: Disaster Risk Reduction can take place in the following ways.

2.4.1 **Disaster Management Cycle.** NCRMP reports (2014), states, prevention of disaster is better than disaster response, but even the best prevention measures cannot replace disaster preparedness. However, the highest level of preparedness will never cover all aspects of disaster response. Disaster Risk Management includes sum total of all activities, programmes and measures which can be taken up before, during and after a disaster with the purpose to avoid a disaster, reduce its impact or recover from its losses. The phases are given in **Fig 2.**

The three key stages of activities, that are taken up within disaster risk management are:-

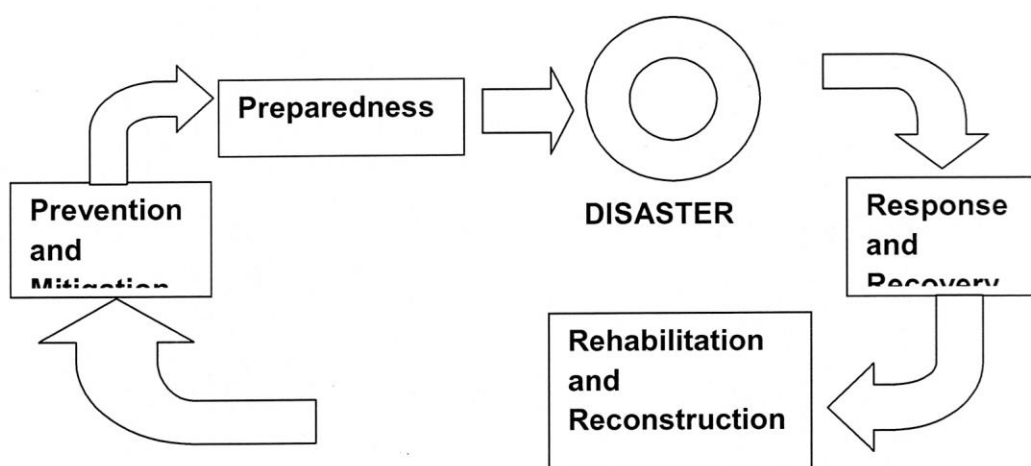


Figure 2: Phases of Disaster Management Cycle.

Source: NCRMP Report 2014

(a) **Before a disaster (pre-disaster).** Activities that are undertaken to reduce human and property losses caused by a potential hazard. Example is carrying out awareness campaigns, strengthening the existing weak structures, preparation of the disaster management plans at household and community level etc. Such risk reduction measures taken under this stage are termed as mitigation and preparedness activities.

(b) **During a disaster (disaster occurrence).** Activities that are undertaken to ensure that the needs and provisions of victims are met and suffering is minimized. Activities taken under this stage are called emergency response activities.

(c) **After a disaster (post-disaster).** Initiatives taken in response to a disaster with a purpose to achieve early recovery and rehabilitation of affected communities, immediately after a disaster strikes. These are called as response and recovery activities.

2.4.3 Sharma, (2014), states, Mitigation, preparedness, response and recovery are generally considered to be the four stages or phases of a disaster management cycle. Each phase consists of a number of steps or activities. The four distinct phases of disaster management cycle are as below:-

(a) **Prevention and Mitigation phase (Pre-disaster)** It may be any action taken to minimize the effect of the disaster or a potential disaster; before, during or after the disaster. The term is often used to refer to actions against potential disasters. Measures adopted maybe physical and structural, such as flood defences or strengthening buildings. Non structural measures include training in disaster management, regulating land use and public education, among others.

(b) **Preparedness(Pre-disaster)** Activities and measures that are taken before a hazard event to ensure effective response to the impact of hazards. Involves measures that enable Govt, community and individuals to respond rapidly to disaster situations and cope with them effectively.

(c) **Response and Recovery Phase (during pre and post disaster)** Immediate measures taken up in anticipation of, during and immediately after a disaster are minimized.

(d) **Rehabilitation and Reconstruction (post disaster)**
The operations undertaken after the disaster with a view to restore a community to its former condition, at the same time encouraging and facilitating the necessary adjustments to the changes caused by the disaster.

2.4.4 Activities undertaken in one phase have knock-on effects on other phases. Level and quality of preparedness would determine the effectiveness of response and recovery efforts. A good design and effective delivery of recovery, rehabilitation and reconstruction programmes can result in effective prevention and mitigation of the disaster and climate risks faced by people and communities.