Disaster means loss of life and destruction of infrastructure. While disaster is usually understood as natural, however in this highly industrialised world manmade disaster is also a recurrent problem. The word disaster has its origin from French word 'Desaster', combination of two terms- 'des', meaning 'bad' and 'aster', meaning 'Star', thus disaster in its root meaning refers to 'Bad Star', the calamities caused by bad fortune. However, Turner has offered a more structured definition, which reads “an event, concentrated in time and space, which threatens a society or a relatively self-sufficient sub-division of a society with a major unwanted consequences as a result of the collapse of precaution which had hitherto been culturally accepted as adequate.”

On the other hand World Bank has defined disaster as a natural phenomenon of limited span, but causing severe destruction to a country's economy. D.K. Smith in one of World Meteorological Organisation documents addresses disaster as “catastrophic consequence of natural phenomena or a combination of phenomena resulting in injury, loss of life or input in a relatively large scale and some disruption to human activities.”

Disaster is generally considered as a phenomenon having catastrophic impact on human life. Harold D. Foster has defined disaster in terms of 'social stress rating'. It is an important methodological tool to assess
disaster from the point of view of human loss, physical and otherwise. It is an innovating method of scaling that defines impact of disaster from the perspective of people involved in the disaster rather than counting on the infrastructural loss in a disaster. Another interesting definition of disaster one finds in the Disaster Management Act, 2005 of India. It writes; “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, 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.”

One also needs to distinguish between hazard and disaster. While hazard is a perceived threat of a natural event to the life and infrastructure of an area, disaster is the actualisation of hazard as it actually results in loss of life and property. It is in this framework of understanding that one needs to distinguish between natural and manmade disasters. Natural disasters are caused by ecological changes. It is therefore we find three broad types of natural disasters:

1. Water related disaster: Flood, cloud burst, tornado, hurricane, storm surge, tidal wave;

2. Wind related disaster: Cloud burst, flash flood, excessive rains, droughts, and communicable diseases; and
3. Earth related disaster: earthquake, tsunami, avalanches, landslides, and volcanic eruptions.

Manmade disasters, on the other hand, are caused by human activities such as negligence at nuclear and power plants, excessive mining and exploration of minerals, overexploitation of national resources causing ecological changes. Some of the manmade disasters are:

I. Ecological disasters like landslide, flood and noise pollution.
II. Fires and forest fires.
III. Industrial accidents/explosion of boilers/gas chambers/gas leak
IV. War/battle/hostile enemy actions and so on?

Management of Disaster

Till recently the above-mentioned forms and types of disasters were treated generally in terms of research, development and management of 'shocks' in isolation. There was hardly any coordinating agency and organic programmes to operationalise in a more institutionalised and integrated manner. Disaster management is, in a way, late entry in the governance of natural crises and calamities. Therefore it is crucially important to simplify disaster management as concepts and programmes of action. Disaster management stands for integrated activities undertaken both by government and voluntary agencies aiming to avoid disaster, and to meet the infrastructure need once disaster actually occurs. It is a continuous process requiring a multidimensional and multiinstitutional activities aiming to
rehabilitate the affected people and the region. In other words, disaster management includes *anticipation, assessment and rehabilitation*. The disaster management Act 2005, defines it as a continuous and integrated process “of planning, organising, coordinating and implementing measures which are necessary or expedient for:

1. Prevention of danger or threat of actual disaster;
2. Mitigation or reduction of risk of any disaster or its severity or consequences;
3. Capacity building;
4. Preparedness to deal with any disaster;
5. Prompt response to any threatening disaster situation or disaster;
6. Assessing the severity or magnitude of effects of any disaster;
7. Evacuation, rescue and relief;
8. Rehabilitation and reconstruction

In brief, disaster management is a multi stage process of:

i) **Mitigation** i.e. to mitigate the causes responsible for disaster. It is a stage in advance planning, which either checks the causes of disaster or reduces the effects of disasters.

ii) **Infrastructural preparedness** i.e. stage of alert to cope up with the actual occurrence of disaster. This involves administrative and economic preparedness, an advance outlay of resources, which can reduce loss of sufferings, both human and infrastructural.
Rehabilitation, Reconstruction and Resettlement i.e. to save lives, to restore infrastructure and communications and to normalise life as early as possible.

Types of Disaster in India

Various types of disasters, which commonly occur in India, are as follows:

Flood

Floods are very frequent natural disaster in India leading to great loss of lives, displacement of people and a great damage to property. Floods, though national phenomena are more frequent in the Indo-Gangetic plains. Flood occurs mainly due to the lack of proper drainage, deforestation and poor flood management schemes. Recent flood in Bihar caused by changing course of riverbed of Kosi is testimony to the fact that ecological imbalance and poor flood control mechanism are principal reasons of disaster caused by floods. Reasons causing floods include: (i) River bank erosion and shifting or riverbeds; (ii) Land slides leading to obstruction of flow and change in the river course; (iii) Convergence of floods in the main and tributary rivers; (iv) Disturbance in the flow due to tidal and backwater effects; (v) Cyclones and storm occurrence; and (vi) Flash floods and cloud burst.

As flood being the most frequent cause of disaster, the Government of India in 1976 constituted National Flood Commission; consisting of one chairperson and five other members having experience in agro economics
and flood control mechanisms. The commission was assigned the task to “evolve a coordinated, integrated and scientific approach to the flood control problems in the country and to draw out a national plan fixing priorities for implementation in the future”. The Commission was expected to “evolve a comprehensive approach to the problem of floods in the country keeping in view the need for optimum and multipurpose utilisation of water resources as also the role of soil conservation and afforestation in flood control.” Its other terms of reference includes “to review administrative and organisational set up for the flood control at the centre and in the states and suggest improvements where necessary, flood control to include flood forecasting and warning, flood fighting, formulation and implementation of flood protection measures; and (ii) to examine the existing arrangements for maintenance of flood protection works and recommend measures for improving the same”. Though the Rastriya Barh Ayog (RBA) submitted its report in 1980, no headway has been made in implementing its recommendation. However the Union Ministry of Water Resources constituted one Expert Committee in October 2001 to examine and suggest on the measures necessary for implementation of RBA recommendations for effective flood management in the country, besides identifying ‘bottlenecks faced by the state government’ in the implementation of RBA report. No further progress has been made in this regard.
Droughts

On the basis of physical characteristics and their impact on socio-economic system, droughts are generally classified as the following:

*Hydrological Drought*: This kind of drought refers to conditions with reduced stream flow and inadequate filling of reservoirs, drying up of water in the surface water storage structure.

*Soil Moisture Drought*: it refers to inadequate soil moisture particularly in semi arid area which may not be able to grow up.

*Meteorological Drought*: It is commonly known situation where rainfall is either mal-distributed or inadequate.

*Famine*: It is situation where mass starvation occurs due to large scale failure to access the food for prolonged period.

*Ecological Drought*: This form of drought occurs when the productivity of a natural eco-system fails drastically and as a result it causes harm to environment.”

Indian Meteorological Development (IMD) is probably the principal agency dealing with drought in India. However recently union cabinet has approved the setting up of “Abiotic Stress Management” that will strive towards developing technology to combat drought and flood. It is only during the 11th plan that the union cabinet has approved the establishment of a new
institute "National Institute of Abiotic Stress Management" costing Rs.73.50 Crores. It has a mandate of characterization of the occurrence of various Abiotic stresses in the country impacting agriculture on a continuous basis and carry out basic and strategic research that will lead to the development of technologies for mitigation and adaptation of crops, livestock, horticulture, fisheries and micro organism to such stresses. It is principally a federal government initiative to secure food security in the country through advance research and development on the subject.

**Earthquake**

Earthquake brings vast destruction unpredictable in space and time. It is estimated that on an average 10000 people die out of earthquake besides infrastructural losses. It is a strong paradox that while earthquake lasts for few seconds; it causes massive destruction lasting for decades. The 'Relief and Rehabilitation Work' take years to bring life back to normalcy. Earthquake is a frequent phenomenon on the Indian subcontinent. The main reason cited by geologists is the continuous movement of the Indian plates and its counterpart Eurasian plates. Volatile tectonic movements and changes cause frequent earthquakes in the Himalayan region particularly in sub-Himalayan plains of north India, Garhwal division of Uttarakhand and Jammu and Kashmir. India's vulnerability has been aptly recorded by "National Disaster Management Guidelines: Management of Earthquakes, April 2007", prepared by National Disaster Management Authority,
Government of India. It further writes: “India’s high earthquake risk and vulnerability is evident from the fact that about 59 per cent of India’s land area could face moderate to severe earthquakes. During the period 1990 to 2006, more than 23,000 lives were lost due to 6 major earthquakes in India....”14 While IMD is responsible for advance warning system on earthquake, the principal work in this regard has been assigned to the National Disaster Management Authority, constituted by the Central Government. It is responsible for preparing guidelines for earthquake management and disaster preparedness. Its vision is “zero tolerance to avoidable deaths due to earthquakes”. Guidelines released by the NDMA on 16 May 2007 states the mission as “to formulate guidelines for the preparation of plans to reduce earthquake risks, and minimize the impact, loss of lives and damage to property caused by earthquakes.”15

The Guidelines envisages a multiinstitutional approach to tackle the problem of earthquakes. The National Executive Committee is expected to prepare the National Disaster Management Plan, and the Union Ministry of Earth Sciences (MOES) to prepare the Earthquake Management Plan “covering all aspects like earthquake preparedness, mitigation, public awareness, capacity building, training, education, research and development, documentation, earthquake response, rehabilitation and recovery.”16 However, according to Guidelines the IMD will remain a nodal agency for the monitoring of seismic activity, and Bureau of Indian Standards (BIS) would prepare earthquake resistance building and other safety codes.
Cyclone

It is yet another devastating disaster affecting severely the coastal regions of India. As a matter of fact Indian subcontinent is probably one of the worst affected regions in the world. Its coastline expending over 8041 Km is exposed to ‘nearly 10 per cent of the world’s tropical cyclones.’ On an average 2 to 3 severe tropical cyclones hit India each year. Severity of damage is due to the accompanying destructive and volatile winds, torrential rainfall and storm surges. Exceptional rainfall and floods generally follow cyclone. As cyclones are caused by swift and circulating winds, one witnesses large scale damage to houses, communication towers and uprooting of trees. According to one estimate about 32 crore people of India is vulnerable to cyclone related disaster. NDMA has recommended for a collaborative structure of management, which includes research and development work by Indian Meteorological Department, Department of Science and Technology and Ministry of Earth Sciences, and rescue support and rehabilitation work by Indian Army.

Tsunami

Tsunami, a kind of earthquake, originates in the sea and travel many miles through the sea causing unpredictable destruction of human life as well as property. Tsunami is a Japanese word meaning ‘harbor waves’. It is caused by coastal quakes, volcanic eruptions and under sea landsides. Tsunami, unlike tidal wave, which makes sea rough, leaves sea calm, but becomes
rough as it gets closer to the coast. Tsunami is known for a series of waves that travels across the ocean at a speed of more than 800 km an hour. Various kinds of Tsunami are categorised as Earth Quake Generated Tsunami; Landslide Generated Tsunami; Volcano Generated Tsunami; Impact Generated Tsunami, Tsunami Generated by explosions and so on. In India NDMA is a nodal agency for disaster management related to Tsunami.

Besides above main types of natural disaster India is also prone to various kinds of manmade disaster such as nuclear disaster, chemical disaster, mine disaster, biological disaster, and environmental disaster. Till recently, India did not have adequate plan and policies for disaster management. Most of the policies were pathological in nature where counter-disaster plans were hardly laid down. A substantive beginning was made only in 2005 when NDMA was established.

**Disaster Management Act in India**

Disaster does not find any place in either of the List of the 7th schedule of Indian constitution. By virtue of not being placed in any of the List, the legislative competence on disaster as per the provision of the Article 248 (residuary powers of legislation) belongs to the union government. However, state governments have been receiving financial assistance for meeting expenditure on six identified natural calamities out of Calamity Relief Fund on the recommendation of the Finance Commission. By practice and convention, the primary responsibility of disaster management lies with the
state governments. "The role of Central Government" writes High Powered Committee (HPC), "is supportive in terms of supplementation of physical and financial resources".\textsuperscript{17}

It was as late as in 1999 that the Government of India for the first time constituted a High Powered Committee (HPC) "(i) to review existing arrangements for preparedness and mitigation of natural and manmade disasters including industrial, nuclear, biological and chemical disaster; (ii) to recommend measures for strengthening organizational structures, (iii) and to recommend a comprehensive modal plan at national, state and district level"\textsuperscript{18}

It was perhaps the first official attempt to systematically approach the issue of disaster management. It had undertaken comprehensive study on various aspects of disaster management in India such as nature and types of disasters vulnerability profile, new culture of disaster management and organisational framework, and planning and finance. It aptly described its objective as to frame out a new culture of disaster management, characterised as "(i) culture of preparedness (presence of well-functioning warning system and the preparedness of vulnerable community); (ii) culture of quick response (promote and appropriate response to crisis); (iii) culture of strategic thinking (creation of a knowledge network); and (iv) culture of prevention (instilling a culture of prevention in disaster managers and all communities)."\textsuperscript{19}
The Committee recommended for setting up of a separate ministry of disaster management. It further observed that traditional ministries and departments were not flexible enough to deal with emergent disaster related situation. As outlined in the HPC Report, the proposed Ministry of Disaster Management would work towards "sustained and focused effort in the area of disaster preparedness, mitigation and management. This Ministry will deal with natural as well as manmade disasters. However its role would essentially be concerned with networking and coordination of natural resources while the concerned ministries will continue to discharge their responsibilities and finances in accordance with the respective disaster management plans and also work in close cooperation with nodal ministry." On the lines of nodal ministry at the centre, the Committee also felt that in each state there should be a separate department of Disaster Management and Mitigation. The department of disaster management needs to be multidisciplinary including experts having experience and knowledge of diverse field. A cabinet committee on disaster management was also proposed, besides setting up of the National Institute of Disaster Management, and the National Centre for Calamity Management. The HPC has also recommended for setting up of disaster management authorities at state level. State level authorities should work under the guidance of Chief Ministers and Ministers of related departments. Disaster mitigation according to the HPC should aim to strike proper coordination among various departments so that any sudden disaster can be dealt with in a more vibrant manner. The Committee further
emphasized on strengthening of district administration towards this end. The Committee wrote:

The district administration is the focal point for the implementation of all government plans and activities. Considerable powers have been vested in the District Collector to carry out relief operations in the shortest possible time. In the event of shortage of funds, he is also empowered to draw money from the district treasury under the emergency powers vested in him. The district administration is also required to prepare an advance contingency plan based upon the type of disaster likely to affect the district. The actual day-to-day function of administering relief is the responsibility of the collector/District Magistrate/Deputy Commissioner who exercises coordination and supervisory power over all departments at the district level.  

For disaster management the major recommendations of the HPC are as follows:

**Preparedness for Disasters**

The preparedness for disaster plays a crucial role in the whole vision developed for disaster management. The entire process of plan preparation needs to be carried out at four different levels, called as level 0, level 1, level 2, and level 3. The specific tasks that should be performed at these levels are:

I. Level 0: Development phase of monitoring and preparedness for any disaster;

II. Level 1: planning for disasters that can be handled at the local level

III. Level 2: Planning for disasters which need to be handled at the state governmental level.

IV. Level 3: Planning for very severe disasters in which intervention of the Central Government plays an important role.
Immediate Response

It is an important and innovative concept that seeks a quick action in case of occurrence of disaster. It involves two major lines of actions:

i) The ‘trigger mechanism’ will be activated before or during the occurrence of a disaster. It would simultaneously start the required prevention and mitigation measures without any loss of time.

ii) It would require a clear delineation of duties and functions including identification of key personnel for the task of disaster response. There should be no loss of time in the first 24-48 hours in planning or seeking clearance or approval or direction from superior officers.

HPC also emphasized the need for a culture of strategic thinking. It should be convergence of traditional and advanced scientific knowledge to manage disaster. National Disaster knowledge Network was also proposed by the HPC. The application of local and traditional wisdom such as rainwater harvesting and managing floods and modern concept of interlinking of rivers for different purposes is one suitable example for it. The HPC also recommended for mapping of vulnerable zones in appropriate resolutions for different types of disaster and microzonation of multiple hazard zones in the country, like division of seismic zones as per their sensitivity to earthquakes. This provision would facilitate authorities to prepare plans in advance so that effective management and mitigation of disaster can be achieved.

National Disaster Management Authority (NDMA)

Based on the recommendation of High Powered Committee and in continuation of the National Disaster Management Act 2005, the Union government constituted the National Disaster Management Authority in
2005. According to the provision of the Act, NDMA is headed by the Prime Minister comprises of vice-chairman with the status of cabinet minister, and eight members with the status of minister of state. The authority has been organisationally designed on the basis of disaster divisions-cum-secretariat system. Each member heads specific division. The authority meets “as and when necessary and at such time and place as the chairperson the National Authority may think fit”.

In order to manage disaster without any delay the act authorizes Chairperson to exercise all the functions of NDMA such as such as laying down policies on disaster management, approval of national plan etc. However such decisions are subject to post facto ratification by the NDMA. Act further empowers chairperson of the National Executive Committee to invite any other competent officer in this regard as it lays down that “the Chairperson of National Executive Committee may invite any other officer of the Central Government or a State Government for taking part in any meeting of the National Executive Committee and shall exercise such powers and performs such functions as may be prescribed by the Central Government in the Constitution with National Authority”.

National Executive Committee assists the NDMA in discharge of its functions and responsibilities. It also ensures the compliance by the state/local authorities of the directions issued by central government. It also acts as a body to coordinate and monitor the disaster related policies. It prepares national plan for disaster management to be approved by national authority.
The committee also issues guidelines for disaster management plan to be prepared by departments of union and state governments, providing technical assistance to state government and authorities to prepare disaster management plan. It also evaluates the preparation to respond to the disaster or disaster situation and it can also issue direction to enhance such preparations. National Executive Committee organises the training programme for the various government employees as well as for 'voluntary rescue workers'. It also makes efforts for general awareness about disaster management. It coordinates disaster response in general as well as central and state ministries and departments and other bodies including the NGO involved in disaster management.

NDMA is vested with the responsibility to "lay down policies on disaster management ; Approve the National Plan; approve plans prepared by the Ministries or Departments of the Government of India in accordance with the National Plan; lay down guidelines to be followed by the State Authorities in drawing up the State Plan; lay down guidelines to be followed by the different Ministries or Departments of the Government of India for the purpose of integrating the measures for prevention of disaster or the mitigation of its effects in their development plans and projects; coordinate the enforcement and implementation of the policy and plan for disaster management; recommend provision of funds for the purpose of mitigation; provide such support to other countries affected by major disasters as may be determined by the Central Government; take such other measures for the prevention of
disaster, or the mitigation, or preparedness and capacity building for dealing with the threatening disaster situation or disaster as it may consider necessary; and lay down broad policies and guidelines for the functioning of the National Institute of Disaster Management." As a matter of fact NDMA in no uncertain terms enjoys considerable authority in the management of disaster.

**Salient Points of the National Policy on Disaster Management**

NDMA has adopted a 'mission-mode approach' towards formation of National Policy on Disaster. This policy framework is also in tune with the provisions of International Strategy for Disaster Reduction, the Rio Declaration, the Millennium Development Goals and the Hyogo Framework 2005-2015. National Policy lays stress on *5C-principle* of disaster management. They are:

I. Community-based disaster management, including last mile integration of the policy, plans and execution.

II. Capacity development in all related areas.

III. Consolidation of past initiatives and best practices.

IV. Cooperation with agencies at national, regional and international levels.

V. Compliance and coordination to generate a multi-sectoral synergy.

In line with the above principles, the following objectives of disaster management have been laid down:

- Promoting a culture of prevention and preparedness – by centre-staging DM as an overriding priority at all levels and at all times.

- Encouraging mitigation measures based on state-of-the-art technology and environmental sustainability.
• Mainstreaming DM concerns into the development planning process.
• Putting in place a streamlined institutional techno-legal framework in order to create and preserve the integrity of an enabling regulatory environment and a compliance regime.
• Developing contemporary forecasting and early warning systems backed by responsive and fail-safe communications and Information Technology (IT) support.
• Promoting a productive partnership with the Media, NGOs and the Corporate Sector in the areas of awareness generation and capacity development.
• Ensuring efficient response and relief with a caring humane approach towards the vulnerable sections of the society.
• Making reconstruction an opportunity to build back better and construct disaster-resilient structures and habitats.²⁷

What appears from above discussion is that the disaster management is principally a constitutional obligation of the union government. It has powers to lay down framework legislation; accordingly the state government has to comply with by taking necessary legal measures to manage disasters. Though the central government has power to issue directions, its role is mainly confined to lay down policy guidelines and to coordinate the activities of the state/local authorities in the management of disaster. Powers are distributed vertically. Next important role of central government is to earmark necessary funds and finances for disaster management. State governments largely depend on the central financing for executing disaster management programmes. Third important conclusion that can be deduced from above is that the disaster management is an inter-departmental activity, therefore need for a one common regulatory authority can hardly be ruled out.
State Disaster Management Authorities

The National Disaster Management Act, 2005 mandates every state and union territory to constitute Disaster Management Authority in consonance with the provisions of this Act. Like NDMA, State Disaster Management Authority (SDMA) consists of nine members, including Chief Minister of state as its ex-officio chairperson. SDMA is principally responsible for preparation and execution of the necessary policy guidelines on disaster. It has plenary power to recommend necessary funds for mitigation and preparedness measures for disaster management. Besides it is also expected to coordinate various activities of the different state departments. The SDMA is further authorised to constitute two principal bodies-

(i) Advisory Committee, and
(ii) State Executive Committee

While Advisory Committee by virtue of its composition is technical in nature, rendering scientific and technical advises; the State Executive Committee is principally responsible for implementation of national and state plans. An interesting federal caveat that one may like to add is while NDMA retains legislature competence of policy formulation, it has delegated its executive authority to the State Executive Committee. This is broadly in tune with Articles 245, 246 and 258 of the Indian Constitution.
The Executive Committee has three major responsibilities: (I) implementation of the national and state plans; (ii) coordinating and monitoring of various departmental activities; and (iii) vulnerability mapping of the regions prone to disaster. The committee provides technical assistance and advice to district and local authorities so that these authorities may carry out their functions in efficient manner.

In conformity with the DMA 2005 states like Arunachal Pradesh, Goa, Haryana, Andhra Pradesh, Delhi, Rajasthan, Himachal Pradesh, Kerala, Mizoram, Punjab, Tripura, Uttarakhand, West Bengal, Bihar and Puducherry have constituted their respective SDMA. However Orissa is the first state in India to constitute an authority on 28 December, 1999 known as Orissa State Disaster Mitigation Authority, an autonomous organisation to look after the reconstruction and rehabilitation works in the post super cyclone of Orissa. It is a nodal agency for disaster reconstruction and coordinates activities with the line departments, international, national and state level NGOs and involved in reconstruction agencies.

Gujarat was probably the next state to establish Gujarat State Disaster Management Authority (GSDMA) 2003, (Gujarat Act No. 20 of 2003). This act seeks to establish Gujarat State Disaster Management Authority, which is a body corporate with perpetual succession and common say. By virtue of this it is a highly powerful body vested with such powers as to; "(a) act as the central planning, coordinating and monitoring body for disaster management
and post-disaster reconstruction, rehabilitation, evaluation and assessment; (b) assist the state government in formulation of policy relating to emergency relief notwithstanding that the implementation of emergency relief shall be the responsibility of the Revenue Department and other departments of the Government; (c) inform the state government and departments of government on progress and problems in disaster management; (d) promote general education and awareness on disaster management emergency planning and response; (e) and matters incidental thereto.”^®

If one carefully analyses different states provisions in this regard recommendations of State Disaster Management Authority are mainly recommendatory in nature, though having executive competence to implement decision of concerned state on its recommendations. But Rajasthan has gone ahead to vest decision-making authorities in the State Disaster Management Authorities. All decisions of the authority are deemed to be the decision of the government and no further reference is required to implement the decision taken by the authority. Bihar has three tier structure of disaster management with nodal agencies coordinating with the various state departments and most importantly there is a provision of bi-annual review of actions, and activities associated with management of natural disaster.^® On the other hand, Uttar Pradesh Disaster Management Act ordains the various departments of the state to prepare a contingency plan for disaster management. Under the provision of the Act, the state has to establish a Disaster Management Institute in order to prepare and maintain
all disaster related data for various purposes. This institute is further expected to coordinate with similar institutions engaged in the area and to adopt and adapt the best institutional practices in this regard.

Andhra Pradesh has constituted a three tier structure of State Disaster Management Authority: (i) State Disaster Management Authority (SDMA), (ii) State Executive Committee (SEC), (iii) District Disaster Management Authority (DDMA), a kind of hierarchical relationship exists among the three structures. Thus SEC and DDMA function under direction and instruction from SDMA and State Government as such. The key components of Tamilnadu disaster management programme are (i) to establish a Disaster Management Authority (DMA), a nodal agency to guide, facilitate, coordinate and monitor various aspects of disaster management, (ii) to take steps for convergence of disaster management and development planning, (iii) to take steps to formulate comprehensive disaster management plans at all levels after taking into account the local conditions, (iv) to focus on the reduction of vulnerability of communities instead of mere disaster relief; and (v) to provide necessary legislative support for recognizing the role of present and future stockholders. Kerala has also constituted the State Disaster Management Authority. Probably Kerala was the first state to constitute district level disaster management authority, (7 April 2007). Kerala is prone to many natural disasters; therefore, Kerala is setting up an international level institute to train people in disaster management.
Madhya Pradesh has announced its disaster management policy in 2002. A committee has been established under the chairmanship of Chief Minister. This committee is known as the Cabinet Committee on Disaster Management. In the event of occurrence of any disaster, specified or unspecified, this committee meets as frequently as it may decide depending upon exigency of the situation. Committees of similar nature are also being constituted at division and district levels under the chairmanship of the divisional commissioner and the district collector respectively. The Revenue Department of the state has been designated as the nodal agency for all types of disasters at the state level. The Labour Department is the nodal department for all industrial and chemical disasters, public health for epidemics, and the home department is the nodal department for all accidents and manmade disasters.³¹

Mizoram is one of the few states in North-Eastern India that has constituted State Disaster Management Authority. State authority has prepared disaster management teams at district, block and local levels. These teams perform multiple tasks of search, rescue, first aid, managing the shelter house, food and water supplies, coordination in relief work and providing trauma counseling and so on. State public works department has establishment of hazard safety cell, which assesses the vulnerability of existing buildings, from earthquake. It also organises workshops to create awareness regarding various hazard and enhance preparedness against such hazard.
So far as financing a disaster is concerned states mainly receives fund from two centrally sponsored schemes namely Calamity Relief Fund (CRF) and National Calamity Contingency Fund (NCCF). CRF provides fund for expenditure for providing immediate relief to the victims of cyclone, drought, earthquake, fire, flood and hailstorm. The contribution in CRF from centre and state is in the ratio of 75:25. In order to ensure that expenditure is made for the purpose of immediate relief to the affected people, states have to follow the guidelines issued by the Ministry of Home Affairs. On the other hand, NCCF has been established for the purpose of financing the calamity of rare severity. The present modalities of NCCF are based on the recommendations of Eleventh Finance Commission. The amount of assistant provided by the central government to state shall be recouped by a levy of special surcharge on central taxes. The initial corps for the NCCF was decided Rs. 500 crore.

What appears from above is that the states are equally concerned for disaster management, but disaster governance largely follows a centralised system of delegation of authority and resources. States serves as adjacent to central authority. The centre makes rules; states only conform and observe these rules. States are also not financially equipped to meet the cost of disaster management and governance. It heavily depends on technical and scientific and financial resources of the centre. NDMA works as apex regulatory body under which direction SDMA has to work. States have least leverage to ignore the direction of the centre.
Disaster Management in Canada

Canada is a vast country covering an area of 9,984,670 Km² and having a coastline of 202,080 km as a result of which Canada is susceptible to various disasters. A brief discussion of these disasters is useful for analysing disaster management in Canada.

Heat Wave Hazard in Canada

The Federal Department of Environment Canada has defined it as a period of more than three consecutive days of maximum temperature at or above 32°C. heat wave causes much death in the southern Ontario and Quebec provinces. However, heat waves rarely cause infrastructural destruction as we find in the case of Hurricanes, floods and tornadoes.

Snow Avalanche Hazard in Canada

As most of the territories of Canada is covered by snow, avalanches are one of the natural hazards of Canada. Snow avalanche is a complex process, which includes gravity, accumulation and deformation of snow cover. Snow avalanche triggers when a huge part of snow mass loses its hold and discharge from the heights of the mountain.

Volcanic Disasters in Canada

Canada is a part of line of subduction zones and transforms faults, referred to as “pacific ring of fire”. Volcano is rupture in the land or sea which
produce magma along with many gases and similar other components. On the basis of eruption volcanoes can be classified into three types viz-active volcanoes, dormant volcanoes and extinct volcanoes. It is found that most of the Canadian geography is vulnerable to volcanic activities.

**Disaster Governance**

In Canada, Department of Public Safety is the nodal agency to deal with different types of disaster. This department has evolved many policies from time to time and it has issued various guidelines for citizens as well as provinces for disaster preparedness. It manages database, besides working towards disaster awareness in Canada. From Constitutional perspective, federal government has competence to legislate over disaster. However disaster management has emerged in a cooperative framework as evident from various federal-provincial joint mechanisms, for example National Disaster Mitigation Strategy. Further, provinces have also enacted legislations and created agencies for disaster management. It is therefore a survey of federal and provincial mechanism has been attempted in the subsequent sections of the chapter for analysing disaster management in Canada.

**Federal Policies on Disaster Management**

There are several important federal policies that deals with the different issues related to disaster management in the country. Federal government
has prepared a federal policy on emergencies (FPE) to address the emergency on national level. The Federal Policy on Emergencies seeks to allocate the role and responsibilities among Canadian departments, besides working towards the evolution of coordination mechanism for dealing with emergencies. Under its policy outline, a new department, Public Safety and Emergency Preparedness Canada (PSEPC) has been established. Further this policy allows the periodic review and amendments in federal policies on emergencies, which reflects the evolving relationship among departments of federal government and provincial government departments.

National Security Policy (NSP)

Federal government in May 2004 enacted the National Security Policy. As outlined in its executive summary “national security policy is a strategic framework and actional plan designed to ensure that Canada is prepared for and can respond to current and future threats. The focus is on events and circumstances that generally require a national response as they are beyond the capacity of individuals, communities or provinces to address alone.”

The basic objective is to build up an integrated security system with watchdog agencies like (i) Integrated Threat Assessment Centre responsible for pooling together necessary information for quick response; (ii) establishment of National Security Advisory Council consisting of non-governmental security experts; and (iv) making of Federal Department of Public Safety, a nodal department to coordinate interdepartmental activities.
Public Safety Department is an advanced centre for monitoring and coordinating the federal response to an emergency. With 11 Regional Offices across Canada, the department deals with in the areas of: critical infrastructure protection, cyber security, disaster mitigation, emergency preparedness, recovery response and regional operations. The department works closely with provincial and territorial emergency organisations (EMOs) in the provinces of Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Northwest Territories, Nova Scotia Ontario, Prince Edward Island, Quebec, Saskatchewan and Yukon. National Security Policy, as a matter of fact, is a visionary and action oriented policy, which ensures Canada's preparedness for current and futuristic threat.

Emergency Management Act 2007

Well within its model of collaborative federalism, the federal units agreed to have Emergency Management Act, (EMA) and a common emergency management framework for Canada. The salient features of the EMA have been outlined by the Public Safety Department as the following:

I. It gives responsibility to the Minister of Public Safety to provide national leadership and set a clear direction for emergency management and critical infrastructure protection for the Government of Canada;

II. It clearly establishes the roles and responsibilities of federal Ministers and enhances the Government of Canada's readiness to respond to all types of emergencies;

III. It enhances collaborative emergency management and improves information sharing with other levels of government as well as the private sector; and

IV. It gives authority to the Minister of Public Safety, in consultation with the Minister of Foreign Affairs, to coordinate Canada's response to an emergency in the United States.
Emergency Management Act (EMA) has come into force in 2007. Being of recent origin the act defines emergency management as prevention, mitigation and preparedness for, response to and recovery from emergencies.

Emergency Management Framework for Canada

It came into effect in January 2005 and is applicable throughout the Canadian union. The ‘Framework’ gives effect to decision taken at July 2004 Council of the Federation meeting, where Premiers agreed to “direct their Ministers to work with the federal government to develop a coordinated strategy for emergency response and readiness for Canada, respecting provincial and territorial laws and plans already in place.” The main purpose of emergency management framework is to protect lives, preserve the environment and protect property and economy. The most important of all these is to protect the human lives. Emergency management comprises of four interdependent risk based function, such as:

Prevention and Mitigation

It refers to elimination or reduction in the “impacts and risks of hazards through proactive measures taken before an emergency or disaster occurs, for example land use management, public education and a protective structure such as flood dykes.”
**Preparedness**

A condition of state of alert to respond to disaster in the shortest possible time and to manage convergence through a well devised emergency response plans and inventories of 'do's and don'ts of emergency management.

**Response**

It is a stage of action to minimize degree of loss, rescue work, and introduction of rehabilitation work.

**Recovery**

The primary objective is “to repair or restore conditions to an acceptable level through measures taken after a disaster.” As a matter of fact it is a stage bringing life to normal. “These four interdependent functions may be undertaken sequentially or concurrently, but these are not independent of each others.”37 Further the emergency management is the collective endeavour of individuals and government at all levels.

**Canada’s National Disaster Mitigation Strategy (NDMS)**

National Disaster Mitigation strategy is an initiative taken by federal, provincial and territorial governments to ensure disaster mitigation as an important part of emergency management in Canada. The primary objective is to prepare Canada as one disaster resilient community. The strategy thus suggested includes both structural (e.g. flood dikes) and non-structural
measures (e.g. land use zoning and building codes). It is as a matter of fact is a pro-active instrument to prioritize federal, provincial and territorial efforts towards disaster risk reduction.

The goal of the National Disaster Management Strategy is “to protect lives and maintain resilient, sustainable communities by fostering disaster risk reduction as a way of life.”

Guiding principles of NDMS includes:

- Preserve Life- Protect lives through prevention.
- Safeguard Communities- Enhance economic and social viability by reducing disaster impacts.
- Fairness- Consider equity and consistency in implementation.
- Sustainable- Balance long-term economic, social and environmental considerations.
- Flexible- Be responsive to regional, local, national and international perspectives.
- Shared- Ensure shared ownership and accountability through partnership and collaboration.

Working and Governance of NDMS

Federal, Provincial and Territorial (FPT) Ministers responsible for Emergency Management are also responsible for approving the NDMS, and its implementation in their respective jurisdictions. Further FPT Ministers are expected to conduct, review and approve a cost-sharing framework that actively supports long-term implementation of the NDMS. Deputy Ministers responsible for Emergency Management have oversight and implementation
responsibility. They periodically review NDMS and for providing strategic direction. Further Deputy Ministers identify and refer issues that require ministerial direction to the FPT Ministers, with recommended courses of action, so that there can be a comprehensive disaster mitigation in Canada. Senior officials are responsible for monitoring the success of the program and recommending improvements to the FPT Deputy Ministers for approval.

The strategy paper laid down two working principles of disaster governance (i) informed-decision making system; and, (ii) a bottom-up structure that engages and enhances local level responsibility.

Proper finance mechanism is very important component in disaster management. It can be maintained that there is collaborative mechanism of cost sharing in Canadian federalism. Primarily it is provincial responsibility to bear the burden of disaster. However federal financial assistance enters into scene when provincial expenditure exceeds the limit set up under Disaster Financial Assistance Arrangement (DFFA). Public Safety Canada administers the DFFA. It needs to be maintained that if provinces meet their thresholds i.e. $ 1 per capita on provincial population than cost for disaster is shared by federal government. However in case of First Nation the entire cost of disaster is borne by federal government. However federal government provides financial assistance for high intensity disaster only.

By way of summary submission, it may be mentioned that disaster management has emerged as one of the critical challenges to federal
governance in India and Canada. It requires a redefinition and redistribution of competences. Compared to India, Canadian constitution does provide for civil emergency management powers to provinces. But, it has evolved a consensual framework of disaster management with federal government playing key roles in framing of rules, inter-provincial coordination, and above all providing leadership. Disaster management is subject of shared responsibility. Interestingly, Canadians conceptually twines national security with public welfare as to provide critical content to disaster management programmes. It is perhaps the reason that the federal, provincial and territorial governments join hands together to produce common national framework for emergency management with federal public safety department playing the role of a nodal agency. Compared to Canada, India has adopted a centralised framework for disaster management. States are only executive agency of central regulations and programmes on disaster management. Critical competence of rule-making and policy formulation lie with federal government NDMA is the key regulatory institution providing axial guidance to states in disaster preparedness and mitigation. Legally and constitutionally speaking there is practically no role for local government. But in Canada, municipal governments play extremely important role in emergency management. One may probably hope that two federal polities in due course will embark upon content specific division and sharing of responsibilities so far as disaster management is concerned.
Endnote

2 Ibid.
8 Gazette of India. *Disaster Management Act*, p.2.
9 http://www.wrmin.nic.in (Ministry of Water Resources Write up “Rastriya Barh Ayog”).
10 http://www.wrmin.nic.in (Ministry of Water Resources Write up “Rastriya Barh Ayog”).
11 http://www.wrmin.nic.in (Ministry of Water Resources Write up “Rastriya Barh Ayog”).
18 http://www.ndmimdia.nic.in/committee/hpcomm.html (also see Annexure I, pp.5-8 of the report of HPC, published by the Ministry of Agriculture, Government of India, 2001).
19 Government of India. *High Powered Committee on Disaster Management*, p.4.
20 Ibid. p.11.
21 Ibid. p.5.
23 Ibid.
29 http://disastermgmt.bih.nic.in/Reports/Plans%20&%20Reports.htm.
38 http://www.publicsafety.gc.ca.