A CRITICAL OVERVIEW OF DISASTER MANAGEMENT LAW IN INDIA

A Dissertation submitted in Partial Fulfillment of Requirement of the Degree

Of

LL.M [HUMAN RIGHTS]

Under the Guidance of

Dr. (Prof.) M.K RAMESH

SUBMITTED BY

POONAM KUMARI

I.D. No. 324

HUMAN RIGHTS

MAY 2010

NATIONAL LAW SCHOOL OF INDIA UNIVERSITY, BANGALORE

To,

The Chairman,

Post Graduate Council,

NLSIU, Bangalore.

Subject: Permission to submit the dissertation.

Dear Sir,

This is with reference to submission of dissertation in partial fulfillment of LLM (Human Rights) Degree at the NLSIU, Bangalore.

I have completed my dissertation titled "**A Critical Overview of Disaster Management Law in India**" in accordance with the requirements, verifications and suggestions of my guide, Dr.(Prof.) M.K.Ramesh. Pursuant to that I would like to request you to allow me to submit the same.

Thanking you,

Poonam Kumari

ID NO 324

NLSIU Bangalore.

Endorsed by

Dr. (Prof.) M.K.Ramesh

Signature

Chairman, PG Council

Declaration

I hereby declare that this dissertation entitled "**A CRITICAL OVERVIEW OF DISASTER MANAGEMENT LAW IN INDIA**" is the outcome of research conducted by me under the guidance of **Prof. (Dr.) M.K.Ramesh, National Law School of India University, Bangalore.**

I also declare that this is original except for such help taken from such authorities as has been acknowledged at the appropriate places.

I further declare that this work has not been submitted for any degree in any university.

Bangalore.

Date: 11/5/2010

Poonam Kumari

POONAM KUMARI

LL.M (Human Rights)

I.D.-324

CERTIFICATE

This is to certify that this Dissertation entitled "A Critical Overview Of Disaster Management Law In India", submitted by Poonam Kumari (I.D. NO. 324), for the Degree of Masters of Laws during 2010, of the National Law School of India University, is the product of bonafide research carried out under my guidance and supervision. This Dissertation or any part thereof has not been submitted for any degree at any other university or institution.

Dr. (Prof.) M.K.Ramesh

DATE: 11|5|2010

Place: National Law School of India University,

Bangalore

DEDICATED

TO

My Beloved Parents

Shri Birendra Pratap

&

Smt. Indu Pratap

Manish

Preeti

ACKNOWLEDGEMENT

I am extremely grateful and highly indebted to my guide Prof. M.K.Ramesh for encouraging and guiding me throughout my LL.M course at National Law School of India University. Without his valuable guidance and help this research work would not have been possible.

I would like to thank my parents and my brother & sister who have always been the source of inspiration for me for their love support and blessings. Would also like to thank all my friend and well wishers who were always there to encourage me.

I am grateful to the library staff especially Shri. Navalgund , Shri. Ramesh , Shri. Madhu and other library staff at National Law School of India University who have played a vital role in completing this research work.

Thank you

Poonam Kumari

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LIST OF ACRONYMS

CPDC – Central Disaster Prevention Council

CMG- Crisis Management Group

DPC- Disaster Prevention Council

DPP- Disaster Prevention Plan

IDNDR- International Decade for Natural Disaster Reduction

INGO- International Non Governmental Organisation

NCMC- National Crisis Management Committee

SCDO- State Counter Disaster Organisation

A CRITICAL OVERVIEW OF DISASTER MANAGEMENT LAW IN INDIA

INTRODUCTION

Disaster is unlike anything else in human experience. A disaster is widely perceived as an event that is beyond human control: the capricious hand of fate moves against communities creating massive destruction and prompting victims to call for divine support as well as earthly assistance. It strikes quickly – it changes the lives of all it touches and its effects are felt long after the event.

The Indian subcontinent is among the world's most disaster prone areas. With its vast territory, large population and unique geo climatic conditions, Indian sub continent is exposed to natural catastrophes traditionally. Even today the natural hazards like floods, cyclones, droughts, and earthquakes are not rare or unusual phenomenon in the country. Among 35 States/Union Territories, 25 are disaster prone. While average loss of life is 3600, 1.42 million hectare crop area is affected and 2.36 million houses are damaged annually.[1]Though in many cases, the loss go unnoticed from the general public but, the figures are quite concerning. In India, while 40 million hectares of landmass prone to floods, 68% of the total areas, are vulnerable to periodical droughts.

At the global level, there has been considerable concern over natural disasters. Even as substantial scientific and material progress is made, the loss of lives and property due to disasters has not decreased. In fact, the human toll and economic losses have mounted. It was in this background that the United Nations General Assembly, in 1989, declared the decade 1990-2000 as the International Decade for Natural Disaster Reduction with the objective to reduce loss of lives and property and restrict socio-economic damage through concerted international action, specially in developing countries.[2]

[1] http://www.ndmindia.nic.in
[2] http://www.unisdr.org

The Super cyclone in Orissa in October, 1999, Bhuj earthquakes in Gujarat in January, 2001, Tsunami in 2004 and floods, droughts and other disasters striking every year underscored the need to adopt a multi dimensional endeavor involving diverse scientific, engineering, financial and social processes; the need to adopt multi disciplinary and multi sectoral approach and incorporation of risk reduction in the development plans and strategies.

"Disaster Management" is one of the front running themes among contemporary global issues. Disaster control and mitigation measures have been gradually attaining a level where it could be called a subject to be extensively taught or practiced. The UN General Assembly has declared the decade of the nineties (1990s) as the International Decade for Natural Disaster Reduction (IDNDR). UN and other associate agencies have called for a global concerted action for reduction of occurrence of natural disasters and control of manmade disasters. It is strongly being realized internationally that any attainment of local, national, regional or global sustainable development would be a misnomer without undertaking such measures at the earliest. Improved methods of prediction, proper risk assessment and efficient management plans could be the steps in the proper direction. Coordination among the various governments and specialized agencies could reduce the damage, in particular during the pos-disaster phase, to great extent.

India also have framework both legal and non-legal for the prevention and mitigation of disasters. In this paper researcher has tried to focus on different aspects of disaster and its mitigation and also given suggestions to strengthen the existing mechanism for the purpose of disaster management.

RESEARCH METHODOLOGY

Scope and Limitations:

The scope of the study is limited to the natural and manmade disasters. The researcher intends to analyze the legal framework for disaster management and critically compare it with other jurisdictions. It seeks to explore the way of better management of these disasters by plugging in the loopholes in the present framework.

Hypothesis:

The legal framework providing for the Disaster Management is not efficacious and does not cater to the needs of the victims of these disasters in India.

Research Questions:

1. **What are disasters? How they are managed?**
2. **What are causal factors of disasters?**
3. **What would be contemporary natural and manmade disasters?**
4. **What would be the optimum management for disasters?**
5. **Is the legal frame work adequate to meet the task?**

Method of Analysis:

The methodology adopted in this paper is both analytical and descriptive. The researcher made an attempt to cover the aspect of natural and manmade disasters and suggest some solutions of the problems of disaster management like resettlement, rehabilitation, relief management, disaster control, disaster mitigation, institutional frame work, international cooperation to a

considerable level of education, mass media and training which has a major role in making awareness among people.

Sources of Data:

Sources of data for the most part of this research paper are secondary and heavy dependency is placed on the secondary sources such as books, journals and the online data base materials are extensively used to bring out this paper. Primary data such as legislations, international agreements and reports have also been referred to.

Chapterisation:

There are eight chapters in this research paper. The **Chapter I** deal with the nature and definition of disasters. As disaster, either natural or manmade are very frequent in occurrence from ancient times; these have been defined by many scholars and civilizations in different manners. This chapter also deals with the contemporary natural and manmade disasters, their causes, impacts and scenario in India. The role of Geographical Information System and Remote Sensing is also covered under this chapter.

The Chapter II deals with the Disaster Management in India. As being a disaster prone country India is trying to combat disasters from British period with planning and other mechanism to lessen the effect of disasters. The Relief and Rehabilitation Policy of India is also working for the persons getting affected due to these disasters occurring in the country.

The Chapter III deals with the Salient features of the Disaster Management Act of selected countries. As disaster knows no boundary and limitations due to which every country in the world is very much vulnerable to different kind of disasters, either natural or manmade. So, the

laws are there in every country to combat the affects of the disasters occurring. The chapter deals with the Disaster laws of selected countries.

The Chapter IV deals with the Role played by Law in Disaster Management in India. As there are different laws related with handling, storage, disposal and use of hazardous wastes and there are different ministries who dealt with the different kind of disasters. But the Disaster Management Act, 2005 was introduced and under it all kind of disasters are being dealt. This chapter gives brief information about the role of law in Disaster Management and need of a separate Act for disaster management. In this chapter, case studies of some natural and manmade disasters has also being done, which shows the response of government and legal framework of India towards the disaster victims and their problems.

The Chapter V deals with the Critical Analysis of the Disaster Management Act, 2005. As being a law for mitigating the disasters, there are lacunas and loopholes in the Act which needs to be removed. It lacks so many things and seems to be implemented in a hurry without taken note of the loopholes. So, in this chapter, this aspect of Act has been dealt and some suggestions have also been given to improve the existing law for better management of any kind of disaster.

CHAPTER I

DEFINITION AND NATURE OF DISASTER

The term 'Disaster' has been defined by so many sources in different ways, but at total it means destruction either by natural or manmade resources. As according to **United Nations Department of Humanitarian Affairs (2001)**[3], "a disaster is a serious disruption of the functioning of society causing widespread human, material or environmental losses which exceeds the ability of affected society to cope on its own resources."

As per the **Oxford English Dictionary** states that, the word 'disaster' derives from the 16th century French word 'disastre' which is a combination of two terms "Des' meaning bad or evil and 'Astre' means star, thus 'Desastre' signifying a 'Bad Star' or 'Evil Star': i.e. (bad luck in spiritual terms). Disaster therefore, was implying loss or damage occurring due to some unfortunate star.

Turner (1977) has given a rather comprehensive definition of disaster: "An event, concentrated in time and space, which threatens a society or a relatively self-sufficient sub division of a society which major unwanted consequences as a result of the collapse of precautions which had hitherto been culturally accepted as adequate."

Kreps (1984)[4] has defined, "Disasters are events observable n time and space, in which societies or their larger such units, e.g. Communities, regions incur physical damages and losses and/or disruption of their routine functioning. Both the causes and consequences of these events are related to the social structures and processes of society or their sub-units."

[3] http://ochaonline.un.org

[4] Social Structure and Disaster, edited by Kreps, A. Gary, (Associated University Press, United States of America, 1989)

United Nations Disaster Relief Organization (1984)[5] has defined a Disaster in more qualitative terms: "An event, concentrated in time and space in which a community undergoes severe danger and incurs such losses to its members and physical appurtenances that the social structure is disrupted and the fulfillment of all or some of the essential functions of the society is prevented."

Internationally, the generally accepted definition is: "An occurrence arising with little or no warning, which causes or threatens serious disruption of life, and perhaps death or injury to large numbers of people, and requires therefore a mobilization of efforts in excess of that normally provided by the statutory emergency services." To which one would add, it is "An event which afflicts a community the consequences of which are beyond the immediate financial, material or emotional resources of the community." Another term closely related to disaster is emergency. A disaster might be regarded as a particular type of an emergency. "Disaster" suggests an intense time period and level of urgency. Whereas a disaster is bound by a specific period in which lives and essential property are immediately at risk. However, in terms of modern knowledge, the term 'disaster' denotes any odd event, whether natural or manmade, which can bring about sudden and great miseries to humanity in terms of loss of life or/and property. It also signifies misfortune at larger scale or a calamity of considerable amount for a section of humanity. Such calamitous event may have sudden destructive impact or may create distress over an extended period. The alternative meanings are similar to that of Cataclysm, Catastrophe, Tragedy or Devastation.

[5] http://www.un.org/en/globalissues

A disaster is a serious disruption of the functioning of a society, causing widespread human, material, or environmental losses which exceeds the ability of affected society to copy using only its own resources.

Ingredients of the Definitions of Disaster:

These definitions and many other definitions, generally speaking cover the following aspects:

- The occurrence of the physical event, natural, or manmade or a combination of both;
- The physical events leading to the disruption of normal routine of life of the people living in the territory;
- The loss of life as well as damage to properties, both private and public;
- The effect of the physical event of the people, culture, society, and various other actors under such circumstances;
- Ability or the inability of the states to take care of the consequences arising out of the physical event;
- The nature and the extent of assistance required and received by the affected population from both within and from outside the state; and
- The ability of such an affected population to tide over the situation and plan for the future, both preventive and curative.

Disasters are often classified according to their speed of onset (sudden or slow), or according to their cause to their cause (natural or man-made).

Natural Disasters: A natural disaster is an event caused by natural forces of nature that often has a significant effect on human populations. Typically the human populations either are displaced (left homeless) or killed.

Man-made Disasters: Disastrous event caused directly and principally by one or more identifiable deliberate or negligent human actions. Also called human-made disasters.

CONTEMPORARY NATURAL AND MANMADE DISASTERS

Natural Disasters

A natural disaster is the effect of a natural hazard (e.g. flood, tornado, volcano eruption, earthquake, or landslide) that affects the environment, and leads to financial, environmental and/or human losses. The resulting loss depends on the capacity of the population to support or resist the disaster, and their resilience. This understanding is concentrated in the formulation: "disaster occurs when hazard meets vulnerability". A natural hazard will hence never result in a natural disaster in areas without vulnerability, e.g. strong earthquake in uninhabited areas. The term natural has consequently been disputed because the events simply are not hazards or disasters without human involvement[6].

[6] **http://en.wikipedia.org/wiki/Natural_disaster**

A natural hazard has an element of human involvement. A physical event, such as volcanic eruption, that does not affect human beings is a natural phenomenon but not a natural hazard. A natural phenomenon that occurs in a populated area is a hazardous event that causes unacceptable large numbers of fatalities and/or overwhelming property damage is a natural disaster. Although humans can do little or nothing to change the incidence or intensity of most natural phenomena, they have an important role to play in ensuring that natural events are not converted into disasters by their own actions. For example, when the toe of a landslide is removed to make room for a settlement, the earth can move again and bury the settlement. Human intervention may also cause natural hazards where none existed before. Volcanoes erupt periodically, but it is not until the rich soil formed on their ejects are occupied by farms and human settlements that they are considered hazardous. Finally, human intervention reduces the mitigating effect of natural ecosystems. Destruction of coral reefs, which removes the shore's first line of defense against ocean currents and storms surges, is a clear example of an intervention that diminishes the ability of an ecosystem to protect itself. An extreme case of destructive human intervention into an ecosystem is desertification, which, by its very definition, is a human-induced "natural" hazard.[7]

It is an accepted reality that natural disasters are global phenomenon and strikes regardless of any national boundaries or socio-economic status of region. This has resulted in a strong international fraternity defined at the highest level by several UN bodies. Interestingly, the United Nations had declared the decade from 1990 till 2000 as the International Decade for Natural Disasters Reduction (IDNDR). The objective of the IDNDR is to reduce through

[7] **Singh, S.R., Disaster Management, APH Publishing Corporation, New Delhi 2009, at page no. 5**

concerted international efforts and actions, the loss of life, property damage and social and economic disruption caused by natural disaster.[8]

As being a worldwide phenomenon, there are few types of natural disasters which affects the population and property most, some of them are dealt here:

(1) Flood: A flood is a rise, usually brief, in the water level in a stream to a peak from which the water level recedes at a slower rate. Flood or river flood is a relatively high flow or stage in river, markedly higher than the usual. A mass of water rising, swelling and overflowing land. Any relatively high stream flow which overtops natural or artificial banks in any reach of a stream.

Flooding is a natural and recurring event for a river or stream. Flooding is a result of heavy or continuous rainfall exceeding the absorptive capacity of soil and the flow capacity of rivers, streams, and coastal areas.

The Flood Scenario in India

India is the worst flood-affected country in the world after Bangladesh. In India, of all the disasters that occur in the country, river floods are the most frequent and often the most devastating. The cause for floods is chiefly the peculiarities of rainfall in the country. Out of the total annual rainfall in the country, 75% is concentrated over a short monsoon season of

[8] Murthy Ramana, K., Disaster Management, Dominant Publishers, New Delhi, 2004, at page no. 15

3-4 months. Consequently, there is a very heavy discharge from the rivers during this period causing widespread floods. As much as 40 million hectares of land in the country has been identified as flood-prone. An average of 18.6 million hectares of land is flooded every year.

The other causes for flood are:

- Excessive rainfall of precipitation: In hydrological cycle, whole of evaporation is balanced by precipitation. Flooding is a cause of excessive precipitation. 10 cm of rainfall on 1km square of area = 30 million gallons of water.
- Dam failure: Sometimes bursting of dams causes catastrophic floods. For example, Machu dam in Saurashtra on August 11, 1979, in 1961, the Panshet and Khadakvasla dams in Mula river destroyed a part of the city Pune, and the bursting of Kosi dam in 2008 has causes drastic flood.
- Cloud Bursting: Excessive rain within short period may also be caused due to a cloud burst. Cloud burst are very common in the Himalayas, Orissa and central and western India. Examples are, in Saurashtra in 1979, 50 cm of rainfall in one day due to cloud burst and in Mumbai 2005, more than 940 mm rainfall in one day.

Flood hazards can be divided into three types:

(1) Primary effects: The primary impacts of flooding are those caused by the actual contact with flowing water. Primary effects include:

(a) Damage to household items due to water

(b) Structural damage to the buildings.

(c) Destruction of, roads, railway lines, bridges, engineered structures, boats, ships, transport vehicles, historical monuments, communication systems

(d) Death due to electrocution: A major primary effect of floods is loss of life due to electrocution owing to the contact of water with the electric wires and uprooting electric poles.

(2) The secondary and tertiary effects are long term impacts that are long term impacts that are indirectly related to flooding. The effects are: Destruction of farmlands, health impacts, and disease related to pollution, injuries, stress and depression, disruption of transportation services, gas leaks, lack of clean water, impact on crop prices with food shortage, job loss and work displacement, change in ecosystem, change in river channels, collapse of whole community structure, landslides, epidemics, and misuse of government relief funds.

(2) <u>Drought :</u> *Many definition of drought are available*:

- "actual moisture supply at a given place consistently falls short of the climatically expected moisture supply"
- " a period of dry weather of sufficient length and severity to cause at least partial crop failure"

Common accepted definition is:

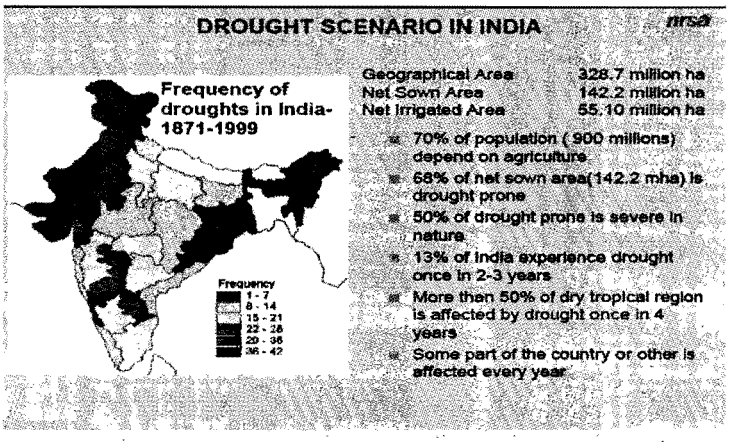
- " a temporary reduction in water or moisture availability significantly below the normal or expected level for a specified period "
- " a creeping situation of scarcity without recharging of resources"

Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. Defining drought is therefore difficult; it depends on differences in regions, needs, and disciplinary perspectives. Based on the many definitions that have appeared in the literature, for example, we might define drought in Libya as occurring when

annual rainfall is less than 180 mm, but in Bali, drought might be considered to occur after a period of only 6 days without rain! In the most general sense, drought originates from a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental sector. Whatever the definition, it is clear that drought cannot be viewed solely as a physical phenomenon.

Drought scenario in India

Drought is a perennial phenomenon in some states of India. Sixteen per cent of the country's total area is drought prone and approximately 50 million people are annually affected by droughts. In fact, drought is a significant environmental problem too as it is caused by a less than average rainfall over a long period of time. In India, about 68 per cent of total agricultural area of



total agricultural area of the country is drought-prone. Most of the drought-prone areas traced by the Government of India lie in semi and sub-humid areas of the country.

Abnormally low rainfall in 1979 in India reported to have reduced the overall food grain by as much as 20%. The 1987 drought in India damaged 58.6 million hectares of cropped area affecting over 285 million people. The 2002 drought had reduced the sown area to 112 million hectares from 124 million hectares and the food grain production to 174 million tons from 212 million tons. The total food grain production in India has to be stepped up from 212 million metric tons to 300 million metric tons by 2020 to meet the food demands of growing population.

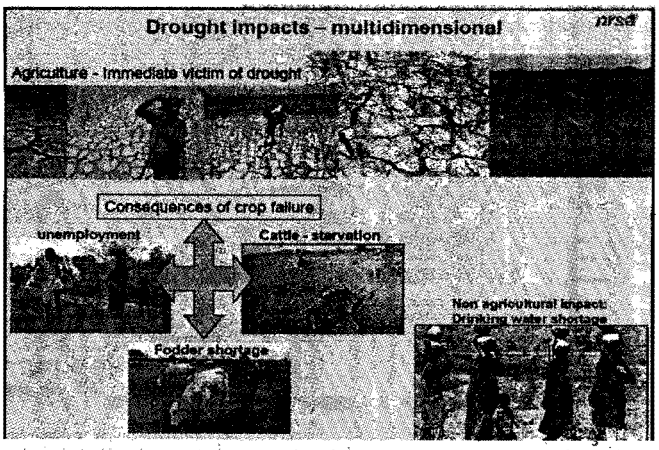
Therefore, there is a need for effective monitoring of agricultural drought, its onset, progression and impact on crops to minimize the damages.

Causes of Drought:

1. **Inadequacy of rainfall**: Due to inadequate and irregular rainfall drought occurs, when the natural water resources does not contain with adequate amount of water for use in agricultural and other purposes then drought occurs.
2. **Lack of irrigation facilities:** In India there is lack of irrigation facilities for agricultural purposes. Generally the irrigation facilities are dependent on rainfall but due to inadequate rainfall these sources are not sufficient for their purpose.
3. Deficient availability for meeting the normal crop requirement in the context of the agro-climatic conditions prevailing in any particular area.

Impacts of Drought:

Drought hazards are a normal aspect of the climate system. They manifest themselves as water stress and continuously intensify as dryness persists. Some droughts last for days while others last for years! Droughts are hazards, but not necessarily disasters. They become disasters when both the natural and human environments become highly vulnerable to the adverse impacts of the drought hazards. Droughts tends to bring out the worst in the affected communities in terms of land degradation, famine, increase in the prices of essential commodities, impoverishment, retardation of economic development, political and resources use conflicts and breaking down of



social ethics. Environmental degradation accelerates during periods of drought due to:-diminished wetland areas; poor land use activities such as cutting down of trees for fuel; wood and charcoal burning for income; bush and range fires and overgrazing. Environmental degradation is in many cases exacerbated by population pressure and migration of the affected communities to marginal lands. The human factor in environmental degradation does not allow the environment to recover even after the end of the drought period. In some cases droughts catalyze desertification, leading to loss of natural resources.

(3) Earthquake

Earthquake is a sudden and transient motion of earth's surface which is primarily caused by disturbance of the equilibrium of rock mass which releases tremendous energy. It may be caused due to volcanic eruptions, Landslides, Explosions etc. Large motions of earth's surface are primarily caused by geological disturbances within the earth,

Earthquake scenario in India: Earthquakes are considered to be one of the most dangerous and destructive natural hazards. The impact of this phenomenon is sudden and violent with little or no warning, making it just impossible to predict or make preparations against damage and collapses of buildings and other man-made structures. About 50-60 per cent of total area of the country is susceptible to seismic activity of varying intensities. Most of the vulnerable

areas are generally located in Himalayan and sub-Himalayan regions, and in Andaman and Nicobar Islands[9]. Although, even the national capital Delhi is not spared.

Important Historical Earthquakes of India[10]:

Place	Year	Richter scale
Delhi	1720	--
Calcutta	1737	--
Mathura/ Kumauni	1803	6.5
Kutch (Gujarat)	1819	8.0
Srinagar, Kashmir	1828	7.5
Cachhar, Assam	1869	7.5
Srinagar, Kashmir	1885	7.0
Shillong	1897	8.7
Kangra, H.P	4th April 1905	8.0
Sibsagar, Assam	31st August 1906	7.0
Srimangal, Assam	8th July 1918	7.6
Dubri, Assam	2nd July 1930	7.1
Dibrugarh, Assam	29th July 1947	7.7
NE Assam	15th August 1950	8.6
Kinnaur, H.P.	19th Jan. 1975	7.5
Silcher, Assam	30th Dec. 1984	6.8
Uttarkashi, Garhwal	20th Oct. 1991	6.6
Latur, Maharashtra	29th Sep. 1993	6.1

[9] Supra no. 3 at page.14
[10] Sources, Red Cross Society of India, New Delhi

Jabalpur, M.P.	29th May 1997	6.0
Chamoli, Garhwal	29th May 1999	6.5
Kutch, Gujarat	26th Jan. 2001	8.0

Causes of Earthquake

Earthquake is a set of vibrations on the earth's surface, ranging from faint tremor to wild motion. These are caused by sudden release of energy stored beneath the Earth. Earthquake is a form of energy, which originates in a limited region and then spreads in the form of waves in all directions from the source of disturbance. Earthquakes are the Earth's natural means of releasing stress. When the Earth's plates move against each other, stress is put on the lithosphere. When this stress is great enough, the lithosphere breaks or shifts. Imagine holding a pencil horizontally. If you were to apply a force to both ends of the pencil by pushing down on them, you would see the pencil bend. After enough force was applied, the pencil would break in the middle, releasing the stress you have put on it. The Earth's crust acts in the same way. As the plates move they put forces on themselves and each other. When the force is large enough, the crust is forced to break. When the break occurs, the stress is released as energy which moves through the Earth in the form of waves, which we feel and call an earthquake.

Effects of earthquake:

- Loss of life and property.
- Landslides and avalanches.
- Development of fissures and cracks.
- Disturbances of groundwater circulation and drainage pattern.

- Up warp and down warp of the crust
- Tsunamis

Secondary effects:

- Collapse or damage of:
  - Buildings
  - Utility structures
  - Lines of communication
  - Roads
  - Railway lines and bridges
  - Water and gas supply systems
  - Electricity lines

(4) TSUNAMI

Tsu-nami is a Japanese word. Tsu-means harbour and `nami' means wave. In earlier times the Japanese fishermen on return to coast from sea voyage found devastation when nothing happened to them at sea and hence named it Tsunami..

CAUSES OF TSUNAMI TRIGGERING

There are four main cause of triggering tsunami:

(1) **Tectonic movement:** When an Earthquake of the magnitude of 7.5 on the Richter scale an above, hits the floor of the sea. The earthquake is caused due to movement of tectonic plates. Waves also spread from the epicentre, the point on the surface above the

hypocentre. If an earthquake occurs under the sea, it can cause a tsunami or a tidal Wave that spreads for thousands of miles.

(2) **Volcanic eruptions:** When an undersea volcanic eruption takes place that's crate enormous force and tsunami.

(3) **Meteorite strike:** When a meteorite or an alien force impact the ocean area, disturbing the water from above, tsunami is caused.

(4) **Landslides:** When there is landslide in the harbor area and affects is felt at bays and causes tsunami.

CHARACTERISTICS OF TSUNAMI

- There is no effect of Tsunami in the sea, even if you are only half to one kilometer from coast.
- Tsunami may come in waves, with a time gap of 40 minutes to one hour between successive major waves. In one major wave, there may be two to three sub waves.
- Although the speed of the approaching Tsunami waves at coast gets reduced from 700-800 km to 50-60 km per hour, they carry enormous energy.
- The height of waves at coast can go up to 50 to 70 feet.
- The retreating Tsunami waves are as quick and as dangerous as their approach and cause as much damage.
- Major devastation is restricted up to 500 meters.

- Tsunami causes more havoc along beaches which have ocean thousands of meter deep, near the coast. In comparison, if the shallow water extends to more than 100 km, the effect will be that much less.

EFFECTS OF TSUNAMI

(1) **Inundation:** The sea water inundates from 300 meters up to 3 km inside the coast line and cause havoc.

(2) **Wave impact on structures:** The waves destroy any structure that comes their way. The destruction to infrastructure is usually very heavy.

(3) **Erosion:** Tsunami wave moves back fast as they approach and cause erosion to the existing structure, especially the foundations.

TSUNAMI IN INDIA

On 26th December 2004 the Indian coastline experienced the most devastating tsunami in recorded history. The tsunami was triggered by an earthquake of magnitude 9.0 on the Richter scale at 3.4° N, 95.7° E off the coast of Sumatra in the Indonesian Archipelago at 06:29 hrs IST (00:59 hrs GMT). It Reached Indian east and south coast in 120 to 150 minutes. The speed of tsunami initially was 750-800 kmph and when it hit coast it was between 35 to 40 Kmph . The heights of the tsunami wave were 10m to 20m and causalities were over 2, 50,000.

IMPACTS:

- December 26, 2004 brought major devastation to the coasts of Thailand, Sri Lanka, India, Maldives, and Indonesia.
- Over 250,000 lives lost, several millions affected through loss of assets and livelihood.

- Macro-economic impacts most evident in tourism and fishing industry, but small scale livelihoods have suffered tremendous.
- Impacts include deaths of people, damage to natural ecosystems and infrastructure,
- Initial response focused on direct relief and humanitarian aid – shelter, food, water supplies, health and security,
- Then moving on to rebuilding and developing sustainable livelihoods, largely dependent on healthy and self-generating ecosystems,

(5)TORNADO

A *tornado* is defined by the National Weather Service (NWS) as "*a violently rotating column of air in contact with the ground and extending from a thunderstorm base.*[1]A tornado does not necessarily have to be visible; however, the low pressures caused by the fast wind speeds usually cause water vapor in the air to condense into a visible *condensation funnel.*

CHARACTERISTICS OF TRONADO

- **Time of day** during which tornadoes are most likely to occur is mid-afternoon, generally 3–7 P.M., but they have occurred at all times of day.
- **Direction of movement** is usually from southwest to northeast. (Note: Tornadoes associated with hurricanes may move from an easterly direction.)
- Length of path averages 4 mi, but may reach 300 mi. A tornado traveled 293 mi across Illinois and Indiana on May 26, 1917, and lasted seven hours and 20 minutes.
- Width of path averages about 300–400 yd but tornadoes have cut paths a mile or more in width.

- Speed of travel averages 25–40 mph, but speeds ranging from stationary to 68 mph have been reported.
- The cloud directly associated with a tornado is a dark, heavy cumulonimbus (the familiar thunderstorm cloud) from which a whirling funnel-shaped pendant extends to the ground.
- Precipitation associated with the tornado usually occurs first as rain just preceding the storm, frequently with hail, and as a heavy downpour immediately to the side of the tornado's path.
- Sound occurring during a tornado has been described as a roaring, rushing noise, closely approximating that made by a train speeding through a tunnel or over a trestle, or the roar of many airplanes.

TORNADO IN INDIA

- New Delhi, Tornado of March 17, 1978 National Capital Region, India 28 fatalities, 700 injuries
- Orissa, Tornado April 10 1978, 150 fatalities.

(6)LANDSLIDES

A landslide is the movement of mass of rock, debris or earth down a slope as a result of failure of the soil and rock material driven by gravity.

CAUSES OF LANDSLIDES:

Natural causes for landslides:

- Saturation of slope material from rainfall or seepage.
- Vibrations caused by earthquakes.
- Volcanic eruptions

Man made causes:

- Excavation or quarrying (particularly at the toe of slope)
- Loading of slope crest
- Deforestation
- Irrigation
- Mining
- Artificial vibrations

LANDSLIDES IN INDIA[11]

Date/Year	Location	Damage
September, 1968	Himachal Pradesh	1km of roads and bridges washed away
December, 1982	Himachal Pradesh	3bridges and 1.5 km length road washed away
October 1990	Nilgiris	36 people killed and several injured
July, 1993	Itanagar, Arunachal Pradesh	25 people buried alive
August 14, 1998	Okhimath	69 people killed
August 18, 1998	Malpa	205 people killed, road network to Mansarovar disrupted.

[11] Ibid 5

MAN MADE DISASTERS

Manmade disasters are of an anthropogenic origin and exemplify some of the terrible accidents that have resulted from human beings interaction with artificial environment, which they themselves have created.[12]

These disasters are events which are caused by man, either intentionally or by accident, which that can directly or indirectly cause severe threats, either directly or indirectly, to public health and/ or well-being. Because their occurrence is unpredictable, man-made disasters pose an especially challenging threat which that must be dealt with through vigilance, and proper preparedness and response. [13]

(1)BIOLOGICAL DISASTERS:

Apart from the natural transnational movement of the pathogenic organisms, their potential use as weapons of biological warfare and bio-terrorism has become far more important now than ever before. Utilization of organisms causing smallpox and anthrax by such terrorist groups can cause greater harm and panic. Biological agents are living organisms or their toxic products that can kill or incapacitate people, livestock, and plants. Bio-terrorism can be defined as the use of biological agents to cause death, disability or damage mainly to human beings. Thus, bio-terrorism is a method of terrorist activity to prevail mass panic and slow mass casualties. The three basic groups of biological agents, which could be used as weapons, are bacteria, viruses and toxins. Most biological agents are difficult to grow and maintain. Many break down quickly when exposed to sunlight and other environmental

[12] Singh, Tej, Disaster Management, Approaches &Strategies, Akansha Publishing House, New Delhi, 2006, at pg no. 14

[13] http://www.ndmc.gov.

factors, while others, such as anthrax spores, are very long lived. Biological agents can be dispersed by spraying them into the air, by infecting animals that carry the disease to humans and by contaminating food and water. Potentially, hundreds of human pathogens could be used as weapons; however, public health authorities have identified only a few as having the potential to cause mass casualties leading to civil disruptions.[14]

Characteristic of Biological Attack:

- Low infective dose
- High virulence
- Short incubation period
- Highly contagious
- Robust and stable - rainfall, temp, humidity, pollution, solar radiation,
- Consistently produce desired effect - lethal or incapacitation

Advantages of Biological Agents:

- Killing efficiency - 1 Gm of Botulinum toxin could kill a million people
- Cost effectiveness - To 'affect' 1 Sq Km area
  - $ 2000 using conventional weapons
  - $ 800 using nuclear weapons
  - $ 600 using chemical weapons
  - $ 1.00 using BW agents -
    "Poor man's atom bomb"
- Ease of production - Small space, minimum technology & resources
- Multiplier effect - a few particles could cause a potential epidemic
- Clandestine operation - Easy to hide in existing laboratories as 'research'

[14] http://saarc-sdmc.nic.in

IMPACTS:

Even a small-scale biological attack with a weapon grade agent on an urban center could cause massive morbidity and mortality, rapidly overwhelming the local medical capabilities. For example, an aerosolized release of little as 100kg of anthrax spores upwind of a metro city of a size of Washington D C has been estimated to have the potential to cause up to three millions of deaths.

(2)NUCLEAR AND RADIOLOGICAL DISASTERS:

A radiological or nuclear emergency that may result from accidents occurring within a facility (such as the department of nuclear medicine and Radiation Oncology) or from external sources involving vehicles transporting radioactive material (RAM) or caused by terrorism event involving nuclear weapon or radiologically contaminated conventional weapons.

NUCLEAR DISASTER

Nuclear disaster occurs when a nuclear chain reaction is accidentally allowed to occur in fissile material, such as enriched Uranium or Plutonium, or may be when a reactor core is damaged.

RADIOLOGICAL DISASTER

When there is emission of radioactive waves from the radioactive element or when nuclear weapons are detonated or nuclear containment systems are otherwise compromised, airborne radioactive particles (**nuclear fallout**) can scatter and irradiate large areas. Not only is it deadly, but it also has a long-term effect on the next generation for those who are contaminated. Ionizing radiation is hazardous to living things, and in such a case much of the affected area could be unsafe for human habitation.

We are exposed to radiation from many radioactive sources. Some people tend to think that radiation is produced artificially in a special place only, but natural radiation exists in our environment. Some people think that "Natural radiation is safe but artificial radiation is dangerous". In fact, radiation produced artificially is not different from radiation originating naturally, either in kind or in effect. Radiation is universal, yet it is not visible, nor does it have odor or taste.

NATURE OF NUCLEAR AND RADIOLOGICAL DISASTER

Because of the different nature of the events it is best to divide the list into **nuclear** and **radiation** accidents. An example of nuclear accident might be one in which a reactor core is damaged such as in the **Three Mile Island accident**, while an example of a radiation accident might be some event such as a radiography accident where a worker drops the source into a river. These radiation accidents such as those involving the radiography sources often have as much or even greater ability to cause serious harm to both workers and the public than the well known nuclear accidents.

However, radiation accidents are more common than nuclear accidents, and are often limited in scale.

CAUSES AND IMPACTS

IONIZING RADIATION

- Ionizing radiation is emitted by

Radioactive materials (Alpha particles, beta particles, gamma rays)

Some devices such as X-ray machines

- When Ionizing radiation interacts with other atoms, they have enough energy to cause ionization of these atoms.

- *Ionizing radiation* is radiation capable of imparting its energy to the body and causing chemical changes

- Alpha particles are ejected (thrown out of) the nuclei of some very heavy radioactive atoms (atomic number > 83). An alpha particle is composed of two neutrons and two protons.

- A beta particle is an electron ejected from the nucleus of a radioactive atom. Depending on its energy, beta radiation can travel from inches to many feet in air and is only moderately penetrating in other materials.

- Gamma rays and X-rays (photons) are able to travel many feet in air and many inches in human tissue. They readily penetrate most materials and are sometimes called "penetrating" radiation.

(3) OILSPILLS:

An **oil spill** is the release of a liquid petroleum hydrocarbon into the environment due to human activity, and is a form of pollution. The term often refers to marine oil spills, where oil is released into the ocean or coastal waters. The oil may be a variety of materials, including crude oil, refined petroleum products (such as gasoline or diesel fuel) or by-products, ships' bunkers, oily refuse or oil mixed in waste. Spills take months or even years to clean up. Oil also enters the marine environment from natural oil seeps.[1] Most human-made oil pollution comes from land-

based activity, but public attention and regulation has tended to focus most sharply on seagoing oil tankers.[15]

Oil spills into rivers, bays, and the ocean are caused by accidents involving tankers, barges, pipelines, refineries, and storage facilities, usually while the oil is being transported to us, its users. During oil spills many things are affected. One of the major things being animals and birds in the sea. Fish, shrimp, and crabs, penguins and other water birds, sea otters, sea lions, seals, and killer whales. The oil gets into their bodies and they die of suffocation. All these creatures swallow the oil and also breathe in the poisonous fumes. Their bodies become coated with oil and thousands of these die in no time.[16]

CAUSES OF OILSPILLS:

- People making mistakes or being careless.
- Equipment breaking down.
- Natural disasters such as hurricanes.
- Deliberate acts by terrorists, countries at war, vandals, or illegal dumpers.

EFFECTS:

Oil floats on salt water (the ocean) and usually floats on fresh water (rivers and lakes). Very heavy oil can sometimes sink in fresh water, but this happens very rarely. Oil usually spreads out rapidly across the water surface to form a thin layer that we call an oil slick. As the spreading process continues, the layer becomes thinner and thinner, finally becoming a very thin layer called a sheen, which often looks like a rainbow. Depending on the circumstances, oil spills can

[15] http://en.wikipedia.org/wiki/Oil_spill
[16] http://archives.chennaionline.com

be very harmful to marine birds and mammals, and also can harm fish and shellfish. You may have seen dramatic pictures of oiled birds and sea otters that have been affected by oil spills. Oil destroys the insulating ability of fur-bearing mammals, such as sea otters, and the water-repelling abilities of a bird's feathers, thus exposing these creatures to the harsh elements. Many birds and animals also ingest (swallow) oil when they try to clean themselves, which can poison them. Depending on just where and when a spill happens, from just a few up to hundreds or thousands of birds and mammals can be killed or injured.

(4) INDUSTRIAL AND CHEMICAL DISASTERS:

INDUSTRIAL DISASTER:

Industrial disasters are caused by chemical, mechanical, civil, electrical, or other process failures due to accident, negligence or incompetence, in an industrial plant which may spill over to the areas outside the plant causing damage to life and property."

CHEMICAL DISASTER:

Chemical disasters are occurrence of emission, fire or explosion involving one or more hazardous chemicals in the course of industrial activity or storage or transportation or due to natural events leading to serious effects inside or outside the installation likely to cause loss of life and property including adverse effects on the environment."

Causes of Industrial and Chemical Disasters:

There are a just as many causes of industrial accidents as there are types of industrial accidents. The broad category of industrial accidents covers anything from small cuts and bruises to huge disasters that affect a large population of people. Approximately 120 million industrial accidents

occur in the work place world wide each year. Approximately 210,000 of these accidents result in fatality. The industries which have the highest rate of accidents are the mining, construction, transportation, and agricultural industries. Construction accidents account for fifteen percent of all accidents and thirty percent of all fatalities in industrial work environments.[17]

Causes of industrial accidents can be broken down into two broad categories: unsafe conditions and unsafe acts. The causes of industrial accidents that pertain to unsafe conditions can include insufficient workspace lighting, excessive noise, slippery or unsafe flooring, extreme temperature exposure, inadequate protection when working with machinery or hazardous materials, unstable structures, electrical problems, machine malfunction or failure, and more. The causes of industrial accidents that involve unsafe acts can include actions or failures to act which result in injury. This can be a result of employee negligence but employers, organizations, and product manufacturers can also be liable for the causes of industrial accidents.

* Major Industrial and chemical disaster across the world:[18]

Place	Year	Approx. loss of life	Cause
Feyzin, France	1966	18	LPG leakage
Flixborough, U.K	1974	51	Cyclohexane
Maxico city, Maxico	1984	500	LPG leakage
Bhopal, India	1984	2000	Release of MIC
Pasadena, USA	1989	23	Isobutane
Vizag, India	1997	58	LPG

[17] http://www.onlinelawyersource.com
[18] Source: Red Cross Society of India, New Delhi

(5) TERRORISM

The word "terrorism" is politically and emotionally charged, and this greatly compounds the difficulty of providing a precise definition. Studies have found over 100 definitions of "terrorism". The concept of terrorism may itself be controversial as it is often used by state authorities to delegitimize political or other opponents, and potentially legitimize the state's own use of armed force against opponents (such use of force may itself be described as "terror" by opponents of the state.). A less politically and emotionally charged, and more easily definable, term is violent non-state actor (though the semantic scope of this term includes not only "terrorists," while excluding some individuals or groups who have previously been described as "terrorists").

By the time the nature and scope of destruction due to terrorism has increased and now it has taken a shape of disaster. As there is no any role of nature this is completely a product of human activity and is a manmade disaster. It has shown many horrific incidents and now it has become a worldwide problem. The major incident took place from the destruction of Twin Towers in United States of America in 2001, when terrorist attacks has killed a large number of populations and challenged the most powerful country of the world. After this incident terrorism got a new face of terror and became a worldwide phenomenon and now counted as disaster.

As for India, who is facing terrorism from a long time, sometimes in the form of Khalsa movement, north- east, Kashmir, Naxalism and so many terrorist organizations asking for their demands and threatening to create a situation of terror in the country. Today, terrorism has been included as disaster in the legal frameworks of the different countries of the world.

REMOTE SENSING AND GEOGRAPHICAL INFORMATION SYSTEM IN DISASTER MANAGEMENT

Disaster, be they natural or manmade, are the real constraints to development and threat to our environment. They undermine developmental efforts and cause loss of life and scarce resources, reduction of productivity and environmental degradation, thus, retarding growth. The frequency and severity of local and regional disasters have already reached the crisis levels. Droughts, floods, landslides, cyclonic storms and other environmental disasters are already posing serious problems in India where the means for mitigation and corrective measures are scarce. Indian scientists have done substantial researches on these disasters. According to the available statistics 60% of the total area of Indian subcontinent is venerable to seismic activity of varying intensities, 16% of the country's total area is drought prone. In India 68% of total sown area of the country is drought prone. Coastal areas of India is exposed to tropical cyclones and among all the disaster occur in the country, River floods are the most frequent and often the most devastating[19].

With diverse geographical environment, population distribution and level of economic development, the occurrence of multi-facet disasters in India including floods, droughts, earthquakes, and cyclones have increased manifold. Natural hazards are the major environmental risks in India. During the 1990s, the International Decade for Natural Disasters Reduction (IDNDR), an attempt was made to strengthen scientific investigation about such disasters. These

[19] **http://www.gisdevelopment.net**

included efforts to gather facts on anthropogenic linkages and impacts on environmental responses and transformation effects for economy through space-timing analysis. The remote sensing data, systematic mapping, surveying and use of GIS techniques for proper development of disaster monitoring and mitigation plan should be introduced in disaster prone regions. Hazard mapping should be imbued with people and disaster management should be developed for decision makers. A socio-economic approach to the study of disasters and a geographical approach for disaster mitigation should be used.[20]

State of Space Technology: Remote Sensing:

Remote sensing is a multi-disciplinary activity which deals with the inventory, monitoring, predicting and assessment of environmental resources through the analysis of data obtained by observations from platform. Remote sensing is the science of deriving information about an object from measurements made at a distance from the object without actually coming in contact with it. When the source of energy is not the sensing system nor the target but an external source of energy as the sun, then Remote Sensing System is called Passive. It detects the solar energy reflected from the target. When the source of energy is the target, the Remote sensing System is then called Active as it detects the energy emitted from the target. When the energy is produced by the remote sensing systems itself, then it is called active and it senses the energy reflected from the target.

Remote Sensing and GIS in Disaster Management Mitigation of natural disaster management can be successful only when detailed knowledge is obtained about the expected frequency, character, and magnitude of hazard events in an area. Although, natural disaster have shown in the last

[20] Singh, R.B., Disaster Management, Rawat Publications, New Delhi, 2000, at pg.no. 12

decades a drastic increase in magnitude and frequency, it can as be observed that there is a dramatic increase in technical capabilities to mitigate them.

Disaster Management:

The use of remote sensing and GIS has become an integrated, well developed and successful tool in disaster management, as we are having our own earth observation programs, and the requirement for hazard mitigation and monitoring rank high in the planning of new satellites. A very powerful tool in combination of these different types of data is GIS. It is defined as a "powerful set of tools for collecting, storing, retrieving at will, transforming and displaying spatial data from a real world for a particular set of purpose". GIS allows the combination of different kinds of data using models. GIS allows for the combination of the different kinds of spatial data, with non-spatial data, attribute data and use them as useful information in the various stages of disaster management.

A complete strategy for disaster management is require to effectively reduce the impact of natural disaster, which is as referred to as disaster management cycle. Disaster management consists of two phases that takes place before disaster occurs, disaster prevention and disaster preparedness, a three phases that happens after the occurrence of a disaster i.e. disaster relief, rehabilitation and reconstruction. In disaster prevention phase, GIS is used to manage the large volume of data needed for the hazard and risk assessment. In disaster preparedness phase it is a tool for the planning of evacuation routes, for the design of centers for emergency operations, and for integration of satellite data with other relevant data in the design of disaster warning systems. In the disaster relief phase, GIS is extremely useful in combination with Global Positioning System in search and rescue operations in areas that have been devastated and where

it is difficult to orientate. In the disaster rehabilitation phase GIS is used to organise the damage information and the post-disaster census information, and in the evaluation of sites for reconstruction. Hence, GIS is the useful tool in disaster management if it is used effectively and efficiently.

Remote Sensing and GIS for Different Application Levels

Natural Hazard information should be included routinely in developmental planning and investment projects preparation. Development and investment projects should include a cost/benefit analysis of investing in hazard mitigation measures, and weigh them against the losses that are likely to occur if these measures are not taken. Remote sensing and GIS can play a role at the following levels:

National level:

At national level, GIS can provide useful information, and create disaster awareness with politicians and the public, so that on a national level decisions are taken on the establishment of disaster management organisations. At such a general level, the objective is to give an inventory of disasters and the areas affected or threatened for an entire country. Mapping scales will be in order of 1:1,000,000 or smaller. The following types of information should be included:

- Hazard free regions for development.
- Regions with severe hazards where most development should be avoided.
- Hazardous regions where development already has taken place and where measures are needed to reduce the venerability.
- Regions where more hazards investigations are required.

- National scale information is as required for these disaster that affect and entire country (drought, major hurricanes, floods etc.)

Regional level:

At regional level the use of GIS for disaster management is intended for planner in the early phase of regional development projects or large engineering projects. It is used to investigate where hazards can be a constraint on the development of rural, urban or infrastructural projects. The areas to be investigated are large, generally several thousand or square kilometer, and the required details of the input data is still rather low. Typical mapping scales for this level are between 1:10,000 and 1:1,000,000. Synoptic earth observation is the main source of information at this level, forming the basis for hazard assessment. Apart from the actual hazard information, as environmental and population and infrastructural information can be collected at a large detail than the national level. Therefore, the GIS can be utilized more for analysis at this scale, although the type of analysis will mostly be qualitative, due to the lack of detailed information.

The Indian Experience:

In order to reduce the risk and vulnerabilities in India the Ministry of Home Affairs, being the Nodal Ministry for Disaster Management, is taking lead on disaster management and mitigation in the country. The Ministry has drawn up a National Disaster Management Framework for the country. This National Framework covers the prime sectors such as institutional mechanisms at all administrative levels, disaster mitigation/prevention to be mainstreamed into the development process, envisaged legal/policy framework, early warning systems, preparedness & emergency response measures and human resource development. The Ministry has undertaken various nationwide initiatives to strengthen disaster management systems in the country. United Nations

Development Programme (UNDP) has joined hands in this effort of Government of India and is implementing GoI-UNDP Disaster Risk Management (DRM) programme in 169 most vulnerable Districts of 17 States in India. Information coordination and management is seen as one of the major challenges in India due to the large geography and diversity of language/cultures. The GoI-UNDP DRM Programme addresses these issues very carefully by using Information and Communication Technology tools for faster response, effective decision making and develop well informed practitioners. Thus, a reliable GIS-based database will ensure the mobilization of right resources to right locations within least response time. Such database would also play a fundamental role in planning and implementation of large scale preparedness and mitigation initiatives. The Ministry of Home Affairs has initiated the development of a GIS-based National Database for Emergency Management (NDEM) in collaboration with various Govt. Ministries/agencies such as Dept. of Space, Dept. of Science & Technology and Ministry of Communications & IT. The Ministry with technical support from UNDP is also in process of developing GIS based tools for emergency management on pilot basis. The resources available, the critical infrastructures etc are mapped for the national capital as demonstrative system.[21]

Analysis of hazard is a complex task, as many factors can play important role in the occurrence of the disastrous event. Therefore, analysis requires a large number of input parameters, and techniques of analysis may be very costly and time consuming. The increase availability of Remote Sensing data and GIS during the last decades has created opportunities for a more detailed and rapid analysis of natural hazard. The proper structure of information system for disaster management should be present to tackle the disaster and to manage it. The remote

[21] **http://www.ndmindia.nic.in**

sensing and GIS database can be used to create elaborate and effective Disaster Management Information System (DMIS). An integrated approach using scientific and technological advances should be adopted to mitigate and to manage natural hazards.

CHAPTER II

DISASTER MANAGEMENT IN INDIA

In the past hundred years India has seen disasters crossing this high mortality mark a number of times. Browsing through the data of previous years it is revealed that India figures among the first 10 in the world in terms of fatalities in the variety of disasters. Among the top 10 railway disasters, India ranked first, she ranked 6th in the case of aviation disasters. In the number killed in avalanches and landslides, India was seventh and in fatalities in the cyclone at the fifth position.

The beginning of some official disasters began with frequent famine took a large toll of people during colonial rule. The British set up the Department of Revenue, Agriculture and Commerce in 1871. On the recommendation of the Famine Commission in 1881[22], a separate department of agriculture was constituted. The latter was upgraded to the Ministry of Agriculture in 1947. In 1969, assessment of damage to crops and live stocks due to natural calamities was brought under its purview. In 1974, matters relating to loss of human life and relief for drought, scarcity or famine were transferred from the Department of Food to Department of Agriculture. Thus, by the mid 1970s the Department of Agriculture became the nodal centre responsible for matters relating to floods and droughts as these were seen to have a regular impact on agriculture. Since earthquakes and cyclones occur at a random, these were to be dealt with "as and when they strike". Other disasters were accorded piecemeal treatment, so a rail disaster of railway became the responsibility of Ministry of Railways and an air tragedy that of the Ministry of Aviation. For chemical disasters, there was the Ministry of Environment and Forest and for biological disasters it was the Ministry of Health. But there was not a department in India which could deal exclusively for all kinds of disasters taking place in the country.

FAILURE TO PLAN:

[22] Indian Famine Commission 1880

A concern to pre-empt and mitigate disasters has not been considered in detail by the Planning Commission. Across the 10 plan documents none have considered earthquakes, cyclones, landslides, weather anomalies or industrial disasters. While the Commission did roll out a number of programmes such as the **Ganga Flood Control Commission (1973), Rashtriya Barh Ayog (1975), Drought Prone Area Programme (1975) and the National Water Policy (1988),** yet among the 29 divisions and 3 special units, there is no unit exclusively for disasters. This is also evident in the works of the Town and Country Planning Organization, as none of the 183 documents prepared by this organization since its birth in 1955 incorporates a disaster plan for any town or region of India. The organization has branches in 26 states capitals and it has diversified its work from drawing master plan of urban areas to 11 other specialties, including regional planning, traffic and transport planning. But apart from 5 surveys undertaken to identify hazardous industries and suggest their relocation, there is little to credit in disaster management.

Over the past couple of years, the government of India has brought about a paradigm shift in the approach to disaster management. In 2002, the subject of coordination of relief measures in the event of natural disasters other than drought was transferred from the Ministry of Agriculture to the Ministry of Home Affairs. The new approach proceeds from the conviction that development cannot be sustainable unless disaster mitigation is built into the development process. Another corner stone of the approach is that mitigation has to be multi disciplinary spanning across all sectors of development. The new policy also emanates from the belief that investments in mitigation are much more cost effective than expenditure on relief and rehabilitation.

Disaster Management occupies an important place in this country's policy framework as it is the poor and the under privileged who are worst affected on account of calamity/disasters. In 2003, the status and the name of National Centre for Disaster Management was further upgraded to the

National Institution for Disaster Management. It was a flagship that heralded the inauguration of a string of 25 Disaster Management centers in states institutes of public administration. In 1990, India had the Disaster Management Institute only in Bhopal, but since 2003 all except a few north eastern states have a disaster management centre. The handful of plans that exists on disaster in India also belongs to the mid 1990s. Acknowledging the wave of interest in disasters, after a year's plan and seven annual plans, the Planning Commission for the first time carried an exclusive chapter on Disaster Management in 10^{th} Five year plan.

The steps being taken by the government emanates from the approach outlines above. The approach has been translated into a National Disaster Framework (a roadmap) covering institutional mechanism, disaster prevention strategy, early warning system, disaster mitigation, preparedness and response and human resource development. The expected input, area of intervention and agencies to be involved at the National, State and district levels have been identified and listed in the roadmap. This roadmap has been shared with all the state governments and Union Territory administrations. Ministries and departments of government of India and the state govt./ union territory administrations have been advised to develop their respective roadmap taking the national roadmap as a brand guideline. There is therefore, now a common strategy underpinning the action being taken by all the participating organizations/stakeholders.

With the alarming rise in the natural and manmade disasters and vulnerability per se, the world community is strengthening its effort to cope up with it. Disasters do not respect boundaries of nations or states, the importance of roadmap should be viewed in a common way. This well known fact was strongly emphasized in the Tsunami of 2004 and earthquake of 2005. A broader view point of management will require the countries to think regionally, not merely nationally, in

preparing to meet the challenge of increasing disaster incidences. What could be suggested is the diverse alliances and strategy at multiple levels i.e. global, regional, national, and sub-national and above all at the grass root, taking into consideration the interests of multi task holders in the process. There is also a need to challenge and revisit the conventional attitude of the institution and organizations in tackling the crisis and their failure to utilize the black letter of law meaningfully in favour of the needy.

RELIEF AND REHABILITATION POLICY IN INDIA

The year 2000 was the last year of **International Decade for Natural Disaster Reduction** and hence the paper draws attention to some of the critical aspects of the consequences of natural disasters. There seems to be special affinity of droughts, floods, earthquakes, cyclones and volcanic eruption for the South Asian sub-continent. Although some areas are known to be prone to earthquakes, cyclones and floods, these disasters are unpredictable. In this decade, of 109 worst disasters, 41 occurred in the developing countries. India suffered two severe earthquakes and a super cyclone. The consequences have been different. In the developing countries the death toll was 7, 58,830, whereas in the developed countries it was 11,141.[23]

In the federal set up of India, the basic responsibility for undertaking rescue, relief and rehabilitation measures in the event of a disaster is that of the State Government concerned. At the State level, response, relief and rehabilitation are handled by Departments of Relief &

[23] Development, Disaster and Displacement: An Appraisal of Policy for Resettlement, A.P.Barnabas, The Indian Journal of Social work. Volume 63, issue 1, January 2002

Rehabilitation.[24] The State Crisis Management Committee set up under the Chairmanship of Chief Secretary who is the highest executive functionary in the State. All the concerned Departments and organizations of the State and Central Government Departments located in the State are represented in this Committee. This Committee reviews the action taken for response and relief and gives guidelines/directions as necessary. A control room is established under the Relief Commissioner. The control room is in constant touch with the climate monitoring/forecasting agencies and monitors the action being taken by various agencies in performing their responsibilities. The district level is the key level for disaster management and relief activities. The Collector/Dy. Commissioner is the chief administrator in the district. He is the focal point in the preparation of district plans and in directing, supervising and monitoring calamities for relief. A District Level Coordination and Relief Committee is constituted and is headed by the Collector as Chairman with participation of all other related government and non governmental agencies and departments in addition to the elected representatives. The Collector is required to maintain close liaison with the district and the State Governments as well as the nearest units of Armed Forces/Central police organizations and other relevant Central Government organizations like Ministries of Communications, Water Resources, Drinking Water, Surface Transport, who could supplement the efforts of the district administration in the rescue and relief operations. The efforts of the Government and non-governmental organizations for response and relief and coordinated by the Collector/Dy. Commissioner. The District Magistrate/Collector and Coordination Committee under him reviews preparedness measures prior to a impending hazard and coordinate response when the hazard strikes. As all the

[24] **http://nidm.gov.in**

Departments of the State Government and district level report to the Collector, there is an effective coordination mechanism ensuring holistic response.[25]

New Institutional Mechanism:

As has been made clear above, the existing mechanisms had based on post-disaster relief and rehabilitation and they have proved to be robust and effective mechanisms in addressing these requirements. The changed policy/approach, however, mandates a priority to full disaster aspects of mitigation, prevention and preparedness and new institutional and policy mechanisms are being put in place to address the policy change.

It is proposed to constitute a National Emergency Management Authority at the National level. The High Powered Committee on Disaster Management which was set up in August, 1999 and submitted its Report in October, 2001, had inter alia recommended that a separate Department of Disaster Management be set up in the Government of India. It was, however, felt that conventional Ministries/Departments have the drawback of not being flexible enough specially in terms of the sanction procedures. The organization at the Apex level will have to be multi-disciplinary with experts covering a large number of branches. The National Emergency Management Authority has, therefore, been proposed as a combined Secretariat/Directorate structure – a structure which will be an integral part of the Government and, therefore, will work with the full authority of the Government while, at the same time, retaining the flexibility of a field organization. The National Emergency Management Authority will be headed by an officer of the rank of Secretary/Special Secretary to the Government in the Ministry of Home Affairs

[25] **http://nidm.gov.in/Institutional**

with Special Secretaries/Additional Secretaries from the Ministries/Departments of Health, Water Resources, Environment & Forests,

National Level:

Agriculture, Railways, Atomic Energy, Defence, Chemicals, Science & Technology, Telecommunications, Urban Employment and Poverty Alleviation, Rural Development and India Meteorological Department as Members of the Authority. The Authority would meet as often as required and review the status of warning systems, mitigation measures and disaster preparedness. When a disaster strikes, the Authority will coordinate disaster management activities. The Authority will be responsible for:-

- Coordinating/mandating Government's policies for disaster reduction/mitigation.
- Ensuring adequate preparedness at all levels in order to meet disasters.
- Coordinating response to a disaster when it strikes.
- Coordination of post disaster relief and rehabilitation.

The National Emergency Management Authority will have a core permanent secretariat with three divisions – one for Disaster Prevention, Mitigation & Rehabilitation, the other for Preparedness and the third for Human Resource Development.

State Level:

At the State level, as indicated in para disaster management was being handled by the Departments of Relief & Rehabilitation. As the name suggests, the focus was almost entirely on post-calamity relief. The Government of India is working with the State Governments to convert

the Departments of Relief & Rehabilitation into Departments of Disaster Management with an enhanced area of responsibility to include mitigation and preparedness apart from their present responsibilities of relief and rehabilitation. The changeover has already happened in eight State Governments/Union Territory Administrations. The change is under process in other States.

The States have also been asked to set up Disaster Management Authorities under the Chief Minister with Ministers of relevant Departments [Water Resources, Agriculture, Drinking Water Supply, Environment & Forests, Urban Development, Home, Rural Development etc.] as members. The objective of setting up an Authority is to ensure that mitigation and preparedness is seen as the joint responsibility of all the Departments concerned and disaster management concerns are mainstreamed into their programmes. This holistic and multi-disciplinary approach is the key to effective mitigation.

District Level:

At the district level, the District Magistrate who is the chief coordinator will be the focal point for coordinating all activities relating to prevention, mitigation and preparedness apart from his existing responsibilities pertaining to response and relief. The District Coordination and Relief Committee is being re-constituted/re-designated into Disaster Management Committees with officers from relevant departments being added as members. Because of its enhanced mandate of mitigation and prevention, the district heads and departments engaged in development will now be added to the Committee so that mitigation and prevention is mainstreamed into the district plan. The existing system of drawing up preparedness and response plans will continue. There will, however, also be a long term mitigation plan. District Disaster Management Committees

have already been constituted in several districts and are in the process of being constituted in the remaining multi-hazard prone districts.

In India we have three leveled relief and rehabilitation policy framework, and after the, implementation of Disaster Management Act, 2005, it has become more easy and powerful tool in the hands of public to access and claim relief and rehabilitation schemes that are governed by the National, State and District authorities.

CHAPTER III

SALIENT FEATURES OF DISASTER MANAGEMENT LAWS OF SELECTED COUNTRIES: A STUDY

Different countries have framed Disaster Management Acts according to their constitutional, political, economical, social and geographical needs and the nature of natural disasters they suffer. Oceanic countries are prone to tornado, tidal and seismic sea waves and countries like India and Bangladesh suffer frequent calamitous floods and droughts. The Acts passed by the various countries are for effective disaster management for the millennium.

CANADA

The Acts for natural disaster management of Canada is known as **Emergencies Act, 1988** and **The Emergency Preparedness Act, 1988**,[26] which is framed to take special measures and arrangements to ensure safety and security during a natural disaster, also known as national emergencies. A 'national emergency' in Canada is any urgent and critical situation of a temporary nature, which seriously endangers the lives, health and safety of Canadians and seriously threatens the ability of the Government of Canada to preserve the sovereignty, security and territorial integrity of Canada and which cannot be effectively dealt with under any other law of Canada. The natural disasters forms the part of 'Public Welfare Emergency' which means an emergency caused by a real or imminent fire, storm, earthquake or any other natural phenomenon, disease in human beings, animals or plants, or accidental or pollution which threatens the life and property, social disruption in the proper flow of essential goods and services. The public welfare emergency is declared is declared by the Governor in the Council. A declaration of a public welfare emergency is effective on the day on which it is issued, but a motion for confirmation of the declaration is laid before each House of Parliament, signed by a minister of Crown.

[26] Emergencies Act, 1988 and The Emergency Preparedness Act, 1988 (Canada)

Once the public welfare emergency is declared, the Governor in the council makes necessary orders and regulations for dealing with the emergency. This includes regulation for the protection of the health and safety of individuals; vacuation of persons and the removal of personal property from any specified area; the requisition, use or disposition of property; the authorization of or direction to any person to render essential services of a type that person, or a person of that class, is competent to provide and the provision of reasonable compensation in respect of services so rendered; the regulation for the distribution and availability of essential goods, services and resources; the authorization and making of emergency payments; the establishment of emergency shelters and hospitals; the assessment of damage to any work or undertakings and the repair, replacement or restoration thereof; the assessment of damage to the environment and the elimination or alleviation of the damage.

DENMARK

The Act for natural disaster management of Denmark is known as the **Danish Preparedness Act, 1995**[27], which is to prevent, reduce and to take remedial measures for any damage inflicted on people, property and environment by natural disasters. The act provided for national rescue preparedness, national regional rescue preparedness and the municipal rescue preparedness. The Minister of Interior is the final administrative authority for all emergency preparedness including laying down specific rules on emergency preparedness. The Minister also authorizes the Emergency Management Agency of Denmark the task of supervision and alert for the entire rescue preparedness. Besides, the Agency manages the national rescue preparedness and advises the authorities on any question relating to the rescue preparedness and the civil preparedness.

[27] The Danish Preparedness Act, 1995 (Denmark)

The Agency also enters into agreements with public authorities, enterprises and other bodies being responsible for preparedness and operations or maintenance of important public activities in cases of these disasters for which the national regional rescue preparedness is in charge of and gives assistance to such tasks. The Agency may request any person to give information considered necessary for the implementation of tasks within the rescue preparedness.

The Minister of Interior may takes assistance from associations, organizations and individuals offering services in performing tasks within the national rescue preparedness. And the individual ministers lays down, within their respective fields of administration, guidelines for the civil preparedness planning of the counties and the municipalities, the concerned ministers also orders public authorities and public and private enterprises and institutions to assist in the planning or implementation of any tasks within the civil preparedness and may order public and private enterprises and institutions to make any such measures required concerning goods, services, means of production, etc; within their ordinary activity which are necessary in respect of the implementation of tasks within the civil preparedness. The municipal rescue preparedness provides a proper operation for the remedy of any damage inflicted on people, property and environment by accidents and disasters, receives billet and feed evacuees and any other distressed persons. The Minister of Interior also decides the rescue preparedness in some municipalities, to provide an extended assistance to the rescue preparedness in other municipalities, in case it is necessary.

One municipal council also coordinates with another municipal council, with private rescue organizations or any other persons to carry out tasks within the rescue preparedness of the municipal council. The agreement is approved by the Emergency Management Agency to carry

out the national, regional rescue preparedness tasks within the rescue preparedness of the municipality.

The volunteers are also given training for rescue preparedness and 'the expenses for the training are met by the government and the municipalities under the rules laid down by the minister. The employees in the public sector and in the private enterprises and institutions also carry out the rescue preparedness duty assigned to them.

If a person refuses or fails to appear or unlawfully absent himself from the place of service or does not carry out any official orders issued by his superiors or, otherwise fails to perform any duties involved in the service, he shall be punished with a fine, imprisonment on lenient terms or imprisonment for up to one year.

JAPAN

The Act for natural disaster management of Japan is known as **Disaster Countermeasures Basic Act, 1997**[28]. According to the Act, disaster means a storm, heavy rain, flood, high tide, earthquake, tsunami and any other unusual natural event for which the State and local government along with public corporations formulates policies and disaster prevention plans. The very purpose of the Act is to protect the national territory, life and limb of the citizens and their property from the disaster.

The government every year reports to the Diet about its plans for disaster prevention along with a general account of measures undertaken for disaster prevention. And it is the responsibility of the State, prefecture, city, town and village to effectively formulate and implement their disaster

[28] Disaster Countermeasures Basic Act, 1977 (Japan)

prevention plans as provided by the Act, with cooperation of local government and concerned agencies.

To carry out the provisions of the Act a Central Disaster Prevention Council (CDPC) is established in the office of the Prime Minister, for the formulation and implementation of the disaster prevention plan and emergency measures. The Prime Minister consults the Council for basic policy of disaster prevention, major points in overall coordination of measures undertaken for disaster prevention, outline for urgent measures of temporary nature for disaster, declaring a state of emergency and any other necessary related matter for disaster prevention.

The CDPC has the right, with respect to its business, to seek data, opinion, views and any other necessary cooperation from the chief officer of an appropriate national or local administrative organ, local government, executive agency or any other appropriate agency. In addition, the CDPC also makes recommendations and provide the instruction to local disaster prevention councils for disaster prevention.

Similarly, a Prefectural Disaster Prevention Council (PDPC) is established in each prefecture for formulation and implementation of a prefectural area disaster prevention plan, formulation, and implementation of a plan for emergency measures in a time of major disaster; collection of information about a disaster that has occurred involving the area of said prefecture; liaison and coordination in matters of emergency measures and rehabilitation programs among said prefecture and appropriate designated local administrative organs, the city, town or concerned village, designated public corporations and designated local public corporation.

Similarly, a city, town or village Disaster Prevention Council (DPC) is established in each city, town or village in order to formulate and implement area disaster prevention plan.

The headquarters for major disaster control is responsible for matters concerning overall coordination of emergency measures being taken under appropriate disaster prevention plan for urgent measures in time of a major disaster.

When the disaster has occurred or likely to occur, a disaster control headquarters is established in the affected area as provided under a prefectural or city, town, or village are disaster prevention plan, headed by the chairman, and the governor of the prefecture, or the mayor of the city or town, or the head of the village serves as chairman at their respective levels.

The government under the jurisdiction of law also takes action so that emergency measures and rehabilitation efforts proceeds expeditiously and appropriately, and at the same time enforce policies in the interest of making equitable the burden of expenses on the local governments, whose area has sustained the disaster and for rehabilitation services. The policies deal with the standards by which special property assistance and auxiliary assistance formed against severe disasters, special incentives for victims of a disaster.

AUSTRALIA

The Act for natural disaster management of Australia (Queensland) is known as **State Counter-Disaster Organization Act, 1978**[29]. The Act is administered by any Minister of the Crown and under the direction of the Director of the State Emergency Service constituted under the Act. The body for disaster management is called the 'State Counter- Disaster Organization' (SCDO), which consists of officials from different departments and any other person appointed by the Governor in Council.

[29] State Counter- Disaster Organization Act, 1978 (Queensland, Australia)

The basic functions of the SCDO are to coordinate the resources necessary to ensure that all steps are taken to counter the effects of a disaster and to give advice and assistance to the Minister on all matters with respect to counter-disaster. There is a body called the 'Queensland State Emergency Service are-t o advice and assist local authorities, government departments, statutory organizations, voluntary groups and other bodies; to educate and train members of the public including volunteers and members of voluntary groups; to coordinate, direct and control members of the public including volunteers and members of the public including volunteers, material and resources for counter-disaster purposes.

The Minister appoints executive committees and advisory committees, necessary to assist the Organization and the State Emergency Service in the efficient performance of its functions and in achievement of its objective and purpose.

Once a district is declared a disaster district by the Governor in the Council, there established a 'disaster district control group' comprising a disaster district coordinator appointed by the Governor. The functions of the Disaster district control group are to make counter-disaster plans for its disaster district and review them from time to time and submit plans and revised plans to the Central Control Group and to keep and maintain up to date standing orders for counter-disaster purpose.

When the disaster district coordinator considers, that the magnitude or threatened magnitude of a disaster that the counter-disaster measures necessary or desirable in respect of the disaster is beyond the capacity of statutory service, he after consultation with the disaster district control group for that district and with the approval of the Minister, declares that a state of disaster exists in respect of that district. Once the disaster is declared the Chairman takes such measures which

are in accordance with the disaster contingency plans, directions and orders of the Central Control Group; he directs the resources of the government of the State and other resources that he considers necessary to relieve the effect of the disaster; authorize the expenditure of money as determined by the government of the State to relieve personal distress and assist in counter-disaster measures.

The Chairman or a disaster district co-coordinator, for the preservation of human life can take charge of any resources owned by a person or ask them to surrender them and palce them under the control and direction of any authorized person involved in counter-disaster operation and can also direct the evacuation and exclusion of persons from any place and remove a person who does not comply with a direction to evacuate or a person who enters or found in a place in respect of which a direction for the exclusion of persons has been given.

The Local Authorities also prepare a local counter-disaster plan to deal with all counter-disaster measures within its area and with the approval of the Minister, enter into agreement and unite with one or more than one other Local Authority for the purpose of arranging and carrying out counter- disaster measures in the combined Areas of the Local Authorities that are parties to the agreement.

Disaster Management Act 2003, Australia:

During 2002-03 the Department of Emergency Services undertook a comprehensive review of the State Counter Disaster Organization Act 1978 in consultation with a wide range of stakeholders. The review resulted in the development of the *Disaster Management Act 2003* (DM Act). The DM Act repealed and replaced the State Counter-Disaster Organisation Act when it commenced by proclamation on 31 March 2004.

The Disaster Management Act maintains many elements of the existing system established under the State Counter Disaster Organisation Act, while adding contemporary elements such as a focus on comprehensive disaster management, which includes disaster mitigation, prevention, preparedness, response and recovery.

Objectives of the Act

The main objectives of the Disaster Management Act are:

- To help communities:
  - mitigate the potential adverse effects of an event;
  - prepare for managing the effects of an event;
  - effectively respond to, and recover from, a disaster or an emergency situation.
- To provide for effective disaster management for the State.
- To establish a frame work for the management of the State Emergency Service (SES) and emergency service units to ensure the effective performance of their functions.

The Disaster Management Act establishes Disaster Management Groups at three levels:

- State
- District
- Local (for individual or combined Local Governments and Community Councils)

Disaster Management Groups at all three levels are required to prepare Disaster Management Plans.

The Disaster Management Act replaces the term **state of disaster** with **disaster situation**. A disaster situation may be declared for any area of the State. As with the State Counter Disaster

Organisation Act, declarations of Natural Disaster Relief Arrangement (NDRA) are not dependent on declarations of a disaster situation.

The Disaster Management Act enables declarations and powers under this and other Acts to be exercised at the same time, and provides a mechanism to resolve any conflicts in the case of a declared disaster situation.

Volunteers

The Disaster Management Act maintains the membership of the SES and provides for its functions, for example to perform search, rescue and disaster related activities.

Additionally, the Act enables the establishment, in consultation with the local community, of volunteer emergency service units to perform rural fire and SES functions, and first aid in rural and remote areas, through one integrated unit. These units would provide a more efficient option for the delivery of volunteer emergency services.

The Disaster Management Act also provides Department of Emergency Services volunteers with protection from unfair dismissal when undertaking emergency response, where their absence is reasonable.

Compensation, Insurance and Protection from Liability

The Disaster Management Act provides a mechanism to claim compensation for the loss or damage resulting from the exercise of powers in the Act. The Disaster Management Act also

extends private insurance policies to cover damage caused by responders in a disaster or emergency situation.[30]

The Disaster Management Act, 2003 has brought some changes in the previous Act, to cope up with the changing situation and nature of disasters.

THE NETHERLANDS

The Act for natural disaster management of The Netherlands is known as **Disaster Act, 1985.**[31] According to Act, disaster is an event which seriously affects public safety, thereby posing a serious threat to the life and health of people and/or to significant financial interests and which requires the coordinated use of services and organizations with different disciplines. It also covers a major incident, which requires the use of various emergency services, such as fire services, police and medical relief teams. The disaster management means the services and organizations, which are charged with providing assistance in normal circumstances, also carry out those tasks when major disasters and incidents occur.

The Disaster Management plan adopted by the Municipal Council is characterized as an organizational chart and a system of arrangements and alarms for the coordination of assistance in disaster situations.

The plan also includes- a list of the kinds of disasters which could threaten the municipality; a list of services, agencies, organizations and individual persons who could be called upon for help in disaster management; a diagram concerning the command over and coordinated use of

[30] http://www.disaster.qld.gov.au
[31] Act of 30 January, Book of Statute 88, to adopt New Regulation Regarding Disaster Management and Related Preparatory Measures (Disaster Act, 1985) (The Netherlands)

services and organizations in disaster management; an internal and external communications and alarm diagram; a general plan for alerting the population; a general plan to organize the medical care at the disaster site; a general plan for the provision of food for the population; a general plan with regard to measure for supplying the services and organizations and structure of a central registration and informed office and regulations concerning the reporting obligations. This disaster management plan of a municipality is in the coordination with the plans drawn up in neighboring municipalities and in neighboring areas of other countries.

Once the disaster management plan has been adopted, it is sent within one month, to the Provincial Executive and if the Provincial Executive is of the opinion that the disaster management plan does not satisfy the requirement as laid down by law, it may invite the municipal administration to alter the plan and if the municipal administration fails to respond to an invitation, the provincial executive implements the changes to the disaster plan at the expanses of the municipality.

The Burgomaster is the final command in the event of any disaster and those who participate in disaster management are under his/her command. He/she is supported by a municipal disaster management team.

At the administrative level, the Burgomasters coordinate disaster management. They may appoint one of the Burgomasters coordinator. But the coordinating Burgomaster does not have complete autonomy. Each Burgomaster retains final command over disaster management within his/her own municipality. In the exceptional cases, the Queen's Commissioner in the province may request for military assistance to the Minister.

In the year 2009, the Dutch government was awarded a prize in Brussels today for its international approach in tackling environmental disasters. The Green Star Award is presented to organizations who have worked to prevent, prepare for or respond to the environmental impact caused by disasters.[32]

UNITED STATES OF AMERICA

The Act for natural disaster management of USA is known as **The Robert T. Stafford Disaster Assistance and Emergency Relief Act, 1997(FEMA).**[33] The importance of this Act is recognized by the U.S. Congress. The Congress finds it necessary to take the special measures like, rendering of aid, assistance, and emergency services, reconstruction and rehabilitation of devastated area, as disasters often disrupt the normal functioning of governments and communities, and adversely affect individuals and families with great severity.

The Congress also decided to provide means of assistance by the Fedreal Government to State and local governments in carrying out their responsibilities to alleviate the suffering and damage which result from such a disaster by measures like- revising and broadening the scope of existing disaster relief programs; encouraging the development of comprehensive disaster preparedness and assistance plans, programs, capabilities by the States and by local governments; achieving greater coordination and responsiveness of disaster preparedness and relief programs; encouraging individuals, States, and local governments to protect themselves by obtaining insurance coverage to supplement or replace government assistance; encouraging hazard mitigation measures to reduce losses from disasters, including development of land use and

[32] http://international.vrom.nl

[33] The Robert T. Stafford Disaster Assistance and Emergency Relief Act, 1977 (United States of America)

construction regulations; and providing Federal assistance programs both to public and private losses sustained in natural disasters.

The declaration of an emergency (disaster) is based on finding that the situation is of such severity and magnitude that effective responses are beyond the capabilities of the State and the affected local governments, therefore, Federal assistance is necessary.

All the plans and measures by the appropriate agencies for disaster management are established, exercised and executed by authority from the President and all the Federal Agencies are under the directions from the President to utilize their authorities and the resources granted under Federal law.

The plans and measures include utilization of services of appropriate agencies; preparation of disaster preparedness plans for mitigation, warning, emergency, operations, rehabilitation and recovery; training and exercises; post disaster critiques and evaluations; annual review of programs; coordination of Federal, State, and local preparedness programs; application of science and technology and research along with providing technical assistance and grants to states for the development of plans and programs for disaster management.

In the event of any disaster, a Federal Coordinating Officer is appointed by the President in the affected area, He makes an initial appraisal of the types of relief most urgently needed; establishes necessary field offices; coordinate the administration of relief, including activities of the State and local governments, the American National Red Cross, the Salvation Army, the Mennonite Disaster Services, and other relief or disaster assistance organizations, who agree to operate under his advice and direction for distribution of medicine, food, supplies, or other items, and in the restoration, rehabilitation, reconstruction of community services, housing and other

essential facilities. In addition, he also assists the local citizens and public officials in promptly obtaining assistance to which they are entitled.

If low-income households are unable to purchase adequate amounts of nutritious food, the President distributes food coupons through the Secretary of Agriculture or any other appropriate agencies.

Unemployment assistance is also provided to an individual who is unemployed due to a disaster and is not entitled to any other unemployment compensation or waiting period credit, The Legal services are also provided by the President during the disaster and especially to the low-income individuals who are unable to secure legal services to meet their needs as a consequence of natural disaster. And further, assures that legal services programs are conducted with the advice and assistance of appropriate Federal agencies, State and local bar associations.

Professional counseling services, including financial assistance to State or local agencies or private mental health organizations is provided for training of disaster workers, to victims of major disasters in order to relieve mental health problems like depression, and mental trauma caused by disaster or its aftermath. Insurance for loss of facility, property, which is to be restored, replaced, repaired or constructed during disaster and disaster management, is adequately and reasonably made available.

In summary, the President can direct any Federal agency, with or without reimbursement, to utilize its authorities and resources granted to it under Federal law (including personnel, equipment, facilities, technical and advisory services etc.) in support of State and local emergency assistance efforts to save lives, protect property and public health and safety, and lessen the threat of catastrophe; coordinate all disaster relief assistance provided by Federal

agencies, private organizations, and State and local governments; provide technical and advisory assistance to affected States and local governments for the performance of essential community services, issuance of warnings of risks and hazards, public health information including dissemination of such information, provision of health and safety measures and management, control and reductions of immediate threats to public health. In addition, removal of debris, providing temporary housing assistance and assisting State and local governments in the distribution of medicine, food, and other consumable supplies, and emergency assistance.

CHAPTER IV

ROLE PLAYED BY LAW IN DISASTER MANAGEMENT IN INDIA

Disaster, as we know is an unwanted happening occurred due to natural causes or some manmade reasons. But no doubt, all the time any kind of disaster brings havoc, irregularities, mismanagement on a large scale and the situation worsen when it becomes out of control form the hands of administration trying for disaster management. Here at this point, need for the involvement of law is felt to manage the situation arising out of disasters.

Law plays a fourfold role in disaster management:

- **Pre- disaster (Preventive)**
- **During disaster (Administrative)**
- **Post- disaster (Reactive)**
- **Institutional**

Through this role played by law for managing a disaster it becomes effective for the authorities to cover all the areas and helps needed by the affected people without any discrimination and according to their needs.

Pre – disaster Role (Preventive)

In its pre- disaster role, the main objective of the law is its endeavors for the risk reduction. We all know that, natural disasters cannot be controlled by any human activity. So what law can prevent effectively are the manmade disasters and hazards that could come out of these. As it cannot control natural disasters but by, its provisions it can minimize the vulnerabilities and help in capacity building. It also lays down standards for the characterization of disasters, which will be helpful in determining the nature of help and assistance to be provided to the victims.

There are laws in India, which deals with the safe and proper handling of the chemical wastes and hazardous substances so that, the Industrial and chemical disasters can be controlled.

The term 'hazardous substance' finds its meaning in **The Environment (Protection) Act, 1986**[34]**. Section 2(e)** of the Act states that:

"Hazardous substance means any substance or preparation which, by reason of its chemical or physic-chemical properties or handling, is liable to cause harm to human beings, other living creatures, plants, micro-organisms, property or the environment"

Section 8 of the Act provides that:

"No person shall handle or cause to be handled any hazardous substance except in accordance with such procedure and after complying with such safeguards as may be prescribed"

According to **Section 2(d)** of the Act provides that:

Handling, 'in relation to any substance, means the manufacture, processing, treatment, package, storage, transportation etc, use, collection, destruction, conversion, offering for sale, transfer or the like of such substances'

The Hazardous Waste (Management and Handling) Rules 1989[35] was enacted by the Central Government for proper handling of hazardous wastes to control any kind of industrial and chemical disaster. Rule 4 of the Hazardous Waste Rules 1989 deals with the responsibility of the occupier and the operator of facility for handling of wastes. It provides that the occupier generating hazardous wastes in quantities equal to or exceeding the limits specified in the schedule shall take all practical steps to ensure that such wastes are properly handled and

[34] The Environment Protection Act, 1986
[35] The Hazardous Wastes (Management & Handling) Rules, 1989

disposed of without any adverse effects which may result from such wastes and the occupier shall also be responsible for the proper collection, reception, treatment, storage and disposal of these wastes either himself or through the operator of a facility.

The Bio-Medical Waste Management and Handling Rules, 1998[36] was enacted for the proper handling, storage, collection, treatment and disposal of the bio-medical wastes, so that there shall be no pollution and any kind of disaster because of these wastes.

The Factories Act, 1948[37] in, **section 12** also prescribes for the proper disposal of wastes and effluents, it provides that;

'Effective arrangements shall be made in every factory for the treatment of wastes and effluents due to the manufacturing process carried on therein, so as to render them innocuous and for their disposal'.

The basic idea behind this is that, nobody knows how the disaster is going to strike, but from our experiences and ingenuity it can certainly be contemplated what things necessarily invite disaster sooner or later. Law prohibits such things thereby pre-empts occurrence or recurrence of certain disasters.

During Disaster (Administrative)

When the disaster strikes, either natural or manmade a situation of chaos, confusion, agony, scarcity occurs and it becomes very difficult to handle the situation for administration. At that time the law endeavors to continue/ensure the rule of law in such situations.

[36] The Bio- Medical Wastes Management and Handling Rules, 1998
[37] The Factories Act, 1948

The Disaster Management Act, 2005[38], has been enacted by the government of India to handle the situations during the disasters. Under the Act a National Disaster Response Force for the purpose of specialist response to a threatening disaster situation or disaster is to be continued. The general superintendence, direction and control of the Force shall be vested and exercised by the National Authority and the command and supervision of the Force shall vest in an officer to be appointed by the Central Government as the Director General of the National Disaster Response Force.

The Act imposes punishment t persons for contravening the provisions of this Act, 2005 such as obstructing or abandoning, refusing to comply with any of the provisions of the Act, making false claims, misappropriation of money or materials or false warning etc.

The National Authority, the State Authority, or a District Authority is empowered to recommend Government to give direction to any authority or person in control of any radio or audiovisual media or such other means of communication as may be available to carry any warning or advisories regarding any threatening disaster situation or disaster, and the said means of communication and media is designated shall comply with such direction.

Post-Disaster (Reactive)

After the occurrence of disaster, the situation becomes worse because, due to the devastations caused by the disaster the poor and helpless who are the worst affected becomes more vulnerable. For rich and other persons having approach, access to the medical, insurance, financial support is an easy thing but not for all. Due to this attitude of a section of society it becomes difficult to provide help and assistance to the needy person. In this situation, law lays

[38] The Disaster Management Act, 2005

measures for relief and rehabilitation for those affected from the disaster. It also strives to compensate the losses to the extent possible by measures like insurance, ex-gratia awards.

Bhopal Gas Leak Disaster (Processing of Claims) Act, 1985[39], was enacted after the Bhopal gas leak disaster involving the release on 2nd and 3rd December, 1984, of highly and abnormally dangerous gas from a plant of Union Carbide (India) Limited, a subsidiary of the Union Carbide Corporation, USA. More than 2000 people were killed and many suffered from different kinds of health problems. Not only this, the effect of dangerous gas is still prevalent in the sufferers of the disaster. The Act was enacted for making claims by the victims and according to **Section 3** of the Act; the Central Government have exclusive right to represent the claimants inside or outside the country. This Act enabled the victims to fight a legal battle against the Union Carbide to get claims with the help of law enacted in the country form saving them from any kind of sufferings.

Public Liability Insurance Act, 1991[40], has been enacted with the object of providing immediate relief to the victims of accidents that might occur while handling of hazardous substances. Under **section 3** of the Act, the owner who has control over handling of hazardous substance is required under the Act to pay specified amounts to the victims as interim relief based on 'no-fault' liability. Section 4 of the Act makes it mandatory for every owner handling hazardous substances to take out insurance policies. However, the Act could not be implemented on account of the insurance companies not agreeing to give insurance policies for unlimited liability of the owners. It was; therefore, felt that the liability of the insurance companies should be limited to the amount of insurance policy though the owner's liability should continue to be unlimited under the Act. The minimum and maximum limits of the insurance amount in an

[39] Bhopal Gas Leak Disaster (Processing of Claims) Act, 1985
[40] Public Liability Insurance Act, 1991

insurance policy also needed to be specified for ensuring payment of adequate relief. Accordingly, **The Public Liability Insurance (Amendment) Ordinance**[41] was promulgated by the President on **31st January 1992,** as the owners handling hazardous substances had to take insurance policy by 1 March 1992.

Institutional Role of Law

Law creates institutions and authorities at various levels of governance to enforce the mandate of law in pre, post and situations of disasters. These institutional frameworks work for the proper implementations of present legal facilities for the better governance of the situations arising out of disasters.

The National Environment Tribunal Act, 1995[42] has been enacted in view of the phenomenal increase in the cases of accidents occurring in the industries handling hazardous substances. The preamble of the Act refers to some of the decisions taken at the UN Conference on Environment and Development held at Rio de Janeiro in June 1992, relating to the duties of the States to develop National Laws regarding liability and compensation for the victims of pollution and other environmental damages. Accordingly, the Act has been enacted with an object to provide for strict liability for damages arising out of any accident occurring while handling hazardous substances and for the establishment of a National Environmental Tribunal for effective and expeditious disposal of cases arising from such accidents with a view to giving relief and

[41] The Public Liability Insurance (Amendment) Ordinance, 1992
[42] The National Environment Tribunal Act, 1995

compensation for damages to persons, property and environment and for matters connected therewith or incidental thereto.

The accidents arising out of radioactive substances are governed by the **Atomic Energy Act 1962,**[43] the regulations of the **Atomic Energy Regulatory Board and Radiation Protection Rules 1971**[44] made by the Central Government under Atomic Energy Act, 1962.

The Disaster Management Act, 2005 also empowers the Central Government to constitute an institute to be called the National Institute of Disaster Management. The institute functions within the broad policies and guidelines laid down by the National Authority and is responsible for planning and promoting training and research in the area of disaster management, documentation and development of national level information base relating to disaster management policies, prevention mechanisms and mitigation measures.

General:

The role of law in disaster management is as important as any other aspect like, medical, insurance and relief and rehabilitation. The legislation of the country has created strong and enabling environment and institutional framework for thorough disaster management.

Our Constitution also prescribes a duty under **Article 51A (g)**[45]**,** it shall be duty of every citizen of India:

[43] Atomic Energy Act 1962
[44] Atomic Energy Regulatory Board and Radiation Protection Rules 1971
[45] The Constitution of India

'to protect and improve the natural environment including forests, lakes, rivers and wild life and to have compassion for living creatures'

Article 21 also says that:

'No person shall be deprived of his life or personal liberty except according to the procedure established by law'

The legal arrangement in India for managing and handling the disasters is quite strong for supporting the affected people. But the need of the day is proper implementation of these laws in combating disasters in our country.

CASE STUDIES OF DISASTERS

BHOPAL GAS DISASTER

The Bhopal Gas Disaster has raised complex legal questions about the liability of a parent company for the act of its subsidiary, responsibility of multinational corporations engaged in hazardous activities and the transfer of hazardous technology. On the night of 2-3 December 1984, the most tragic industrial disaster in history occurred in the city of Bhopal. Union Carbide Corporation (UCC), An American Corporation with subsidiaries operating throughout the world, was running one of its subsidiaries, Union Carbide India Limited (UCIL), a chemical plant in Bhopal. The plant was situated in the northern sector of the city having numerous hutments adjustment to it on its southern side which were occupied by impoverished squatters. The chemical plant manufactured pesticides called sevin and temik. Methyl Isocynate (MIC), a highly toxic gas, is an ingredient used in the production of both sevin and temik. On the night of tragedy, MIC leaked from the plants in substantial quantities and the prevailing winds blew the deadly gas into the overpopulated hutments adjacent to the plant and into the most densely occupied parts of the city. The massive escape of lethal MIC gas from the Bhopal plant into the atmosphere rained death and destruction upon the innocent and helpless persons and caused widespread pollution to its environs in the worst industrial disaster mankind has ever known. It is estimated that 2660 persons lost their lives and more than 2 lac persons suffered injuries – some serious and permanent – some mild and temporary. Livestock was killed and crops damaged. Businesses were interrupted.

On 29th March 1985, the Government of India enacted a legislation, the Bhopal Gas Disaster (Processing of Claims) Act providing that the Government of India has the exclusive right to represent Indian plaintiffs, in connection with the tragedy. The Act also directed the Indian Government to organize a plan for the registration and processing of the claims of the victims. Pursuant to the Bhopal Act, the Government of India on 8th April 1985, sued UCC in the United States District Court for relief[46]. But the District Court dismissed the Indian consolidated case on the ground of *forum non conveniens* and declared that Indian court was the convenient and appropriate forum to raise the issue. The Court of Appeal in US also declined to grant any relief in this case. Aggrieved from the order of the Court of Appeal, the plaintiff Union of India, filed writ of certiorari before the Supreme Court of America in May 1987. The Supreme Court of USA declined to grant the writ. While the litigations were pending in the UA Courts, an offer of US$ 350 million was made for settlement of the claim. However, the plaintiff Union of India, had filed as parens patriae a suit in the court of District Judge, Bhopal on 5ht September 1986, for US$ 3.3 billion (Rs 3900 crores) as damage i.e. about one year and nine months after the tragic Bhopal Gas leakage[47]. The sole defendant in the suit was the UCC, a foreign corporation incorporated under the laws of the States of New York. The District Judge Deo passed an order on 17th December 1987, and directed the defendant UCC to deposit within two months a sum of US$ 270 million (Rs 350 crores) as interim payment to be disbursed to the victims of the disaster. The defendant UCC moved to the Madhya Pradesh High Court for revision of the order of the District Judge Deo. Justice Seth of the MP High Court reduced the interim damages to US$ 192 million (Rs 250 crores). Both UCC and Union of India filed special leave petitions in the Supreme Court of India against the order of Justice Seth.

[46] The Union of India v. Union Carbide Corporation (United States District Court. Southern District of New York
[47] Union of India v. Union Carbide Corporation, District Court, Bhopal Suit No. 1113/86

On 14th February 1989, the Supreme Court of India came out with an overall settlement of the claims and awarded US$ 470 million (Rs 715 crores) to the Government of India on behalf of all Bhopal victims in full and final settlement of all the past, present and future claims arising from the Bhopal Gas leakage. The Supreme Court also terminated all the civil, criminal and contempt of court proceedings against the corporate officials pending in the Indian Courts. In December 1989, the Supreme Court upheld the constitutional validity of Bhopal Act which conferred exclusive right on the Government of India to represent all Bhopal victims not only in the Indian but even foreign courts. The review petitions under Article 137 and writ petition under Article 132 of the Constitution of India were filed against $ 470 million settlement which raised fundamental issues as to the constitutionality, legal validity, proprietary and fairness of the settlement of the claims of the victims in a mass tort-action. In its settlement recorded by the court while hearing the appeal arising out of interlocutory order passed in the suit. However, the Supreme Court has set aside its earlier order quashing the criminal proceedings against the corporate officials.

However, much the Government of India decides to pay the gas victims, it will have done nothing to upgrade the value of the lives of those who go to work for multinational in Third World Countries, or those whose lives may be suddenly terminated by multinational misadventures. The value of life in countries like India remains pitiably low.

SHRIRAM GAS LEAK CASE

On 4th and 6th December 1985, there was leakage of oleum gas from one of the units of Shriram Foods and Fertilizers Industries situated at Najafgarh, New Delhi and as a result of such leakage several persons were affected and one advocate working at District Courts at Tis Hazari, Delhi died.[48]

The Government as well as the court appointed various expert committees in view of the danger to the community of people living in the vicinity of the caustic chlorine plant in an eventuality of exposure to the chlorine has through an accidental release, which may take place on account of negligence or other unforeseen events. The reports of the expert committees unanimously states that there was considerable negligence on the part of the management of Shriram in the maintenance and operation of the caustic chlorine plant and there were also defects and drawbacks in its structure and design.

On the issue of compliance by Shriram Industries with the provisions of the Air (Prevention and Control of Pollution) Act, it is pertinent to note that the Central Government, in consultation with the Central Board, issued a notification under Section 19(1) of the Air (Prevention and Control of Pollution) Act notifying certain areas in the Union Territory of Delhi as air pollution control areas. The plants of Shriram were admittedly situated in the air pollution control area and the industries carried on by Shriram also fell within the schedule of industries specified in the Air (Prevention and Control and Pollution) Act. Shriram was, therefore, required to apply for a consent order from the Central Board under section 21 of the Air (Prevention and Control of Pollution) Act and the application was accordingly made by Shriram on the basis of which a

[48] http://www.indiaenvironmentportal.org.in

consent order was passed by the Central Board on 13th June 1985, authorizing Shriram to operate their plants in the air pollution control area subject to the condition set out in the consent order.

The court permitted Shriram to restart its power plants for the manufacture of caustic chlorine including, its byproducts like sodium sulphate, hydrochloric acid, stable bleaching powder, sodium hydrochlorite, vanaspati refined oil including its byproducts and recovery plants like soap, glycerine and technical hard oil and container works. The Supreme Court noted that the closure of the plant would result in unemployment of 4000 workmen and non-availability of chlorine to Delhi Water Supply Undertaking. However, the court laid down certain conditions which were to be strictly and scrupulously followed by Shriram and in case of violation of any of these conditions, the permission granted would be withdrawn.

The Supreme Court, therefore, suggested that a high powered authority should be set up by the Government of India in consultation with the Central Board for overseeing functioning of hazardous industries with a view (i) to ensure that there are no defects or deficiencies in the design, structure or quality of their plant or machinery, (ii) there is no negligence in maintenance and operation of the plant and equipment and necessary safety device and instruments are installed and are in operation, and (iii) proper and adequate safety standards and procedures are strictly followed. The Court requested the Government of India to take the necessary steps at the earliest because the problem of danger to the health and well being of the community on account of chemical and other hazardous industries is a pressing problem in the modern industrial society. The Court impressed upon the Government of India to evolve a national policy for the location and lesser risk to the community. The Government was suggested to take precautions to prevent the growth of large human habitation around the areas where hazardous industries were

located. In the opinion of the Court, there should preferably be a green belt of 1 to 5 km width around such hazardous industries.

ASSAM FLOODS 2004[49]

45 percent of Assam's total area is prone to floods and major reason is river Brahmaputra- the longest river that transverse through the State. It originates in Tibet in the North and its outfall is in Bay of Bengal in South. It flows through a total length of 918 km in India, of which 720 km lies in Assam plains itself.

In 1996, floods in Assam damaged 7848 dwellings killing 38 people. In 1999, more than 200 villages were inundated and 0.27 million people in 749 villages of 10 districts were affected. In 2000, 1,94, 328 people in 12 districts and 483 villages were severely affected. Rail and road communications were cut off in many districts. 3 million people lost their homes and vast stretches of paddy were swallowed by floodwater. During 2002 floods, 41 people lost their lives, 19827 houses were damaged and 0.3 million hectares of cropped land was affected.

In 2004 their was incessant rain since last week of June 2004 throughout the State of Assam and adjoining states of Arunachal Pradesh, Meghalaya, Nagaland and Bhutan resulted in floods in rivers Brahmaputra and Barak and their tributaries. One characteristic of this flood was the sudden rise in water levels due to release of water from dams, reservoirs and artificial lakes

[49] http://www.spadeindia.org/floods.html

within and outside the country. The sustained water level of Brahmaputra and Barak rivers above the danger level for an unprecedented length of time, couple with 76 deaths, 172 relief camps, 186162 inmates in the enormity of the disaster. In the rescue plan the State machinery, Army, Air Force, the Para military forces and special disaster management teams of CISF worked together day and night to mitigate the sufferings of the people in the distress. The government machinery and the society both faced the crisis courageously.

A NGO coordination meeting was held where all stake holders participated and assured fullest help. They were asked to help in their areas of specialization. The central team for damage assessment carried out their assessment. Installation of hand tube wells, sanitation drivers, bleaching powder and DDT were taken on priority by District Administration, particularly in relief camps. Medical relief after checkups intensified. Medical camps were organized by the Army through 12 columns in six districts.

Government of India Response:

- Provided helicopters at Guwahati, Tezpur, Dibrugarh, Jorhat and Silcher. They carried out 123 sorties.
- Central govt. released calamity relief fund of Rs. 412.6 million. In addition to Rs. 550 million was released from National Calamity Contingency Fund (NCCF).
- Petroleum Ministry released 400,000 liters of kerosene oil.
- Health Ministry sent a central team to advise the Assam State to prevent outbreak of epidemics.
- ISRO sent a team of communications specialists for establishing terminals. Central search rescue team of CISF was deployed for rescue.

- Govt. of India constituted a high level committee to examine all aspects to find a permanent solution to floods in Assam.

All State Level:

- State level Disaster Management Committee presided over by the Chief Minister monitored the situation on daily basis.
- Flood Management Committees were constituted at State, District and Sub Division levels, to streamline relief works. State Control Rooms started functioning round the clock.
- For preparing district reconstruction plan, district level committees consisting of Deouty Commissioner of District as chair-person and MP, MLAs, Zila Parishad Chairpersons/ head of Dept. as members were constituted.
- NGO coordination was done by having a coordination committee headed by a senior bureaucrat.
- Food stuffs, drinking water, medicines, fodder, veterinary care were distributed.
- Rapid action teams of Health Department were deployed for preventive and curative measures.

Lessons Learnt/Recommendations :

- Identifying the flood prone areas and not allowing habitation there.
- Indian Meteorological Department to give adequate warning on adjoining areas in China, Myanmar and South East Asia, for better appreciation and preparedness for floods and landslides.

- Central Water Commission to set up control stations with Doppler radars, to predict possible rainfall which will help in preparedness as it facilitates even more advanced warning.
- Disaster Risk Management Program for all districts of the State.
- Implementation of Disaster Risk Management Program to 15 non program districts, to promote community participation in tackling of disasters.

KUMBAKONAM SCHOOL FIRE TRAGEDY[50]

The incident occurred in a three story building located in congested Kasiram Street, namely Sri Krishna Girl's High School. On 16th July 2004, at about 10:15 am, preparations were being done to cook the mid day meal for the students. Unfortunately due to the negligence of the cook, the fire spread outside the hearth oven and further thatched roof of the kitchen. A strong wind, normal in the month of July-August in the area, second to fan the flames, as they leapt to catch the thatched roof on the first floor. Seeing a fire outbreak, the teachers allegedly hustled all the children into a classroom that was approximately 15 feet wide and 115 feet long, locked the collapsible door and went to extinguish the fire. About half an hour later, the people fighting the blaze realized that the situation was getting out of control. The children on the ground and first floor were asked to escpae from the school, as the narrow entrance was now opened. However, due to panic generated none thought of the 125 primary children who were locked inside the classroom, partitioned for the five classrooms on the first floor. Smoke rapidly filled the room and children ran for escape and help.

[50] http://www.tn.gov.in

The incident resulted in the death of 93. Another 21 children sustained 30-70% burn injuries. Some parents lost their both kids; some lost their only child and many others one of their children. Many parents who had already undergone family planning operations were left with blankness filled in their eyes and a vacuum, which they did not know whether, could be filled at all.[51]

Response

The Kumbakonam fire tragedy was managed very well in response. The community and the Govt. joined hands making it as a best practice for management of a manmade disaster.

Community

The local community was the first responder on hearing the cries of children. They launched rescue operation immediately. They broke through the walls and windows of the locked classroom and saved many children. They also informed the police and the fire station about the incident. The local auto rickshaw drivers volunteered to provide transportation to injured children. People provided full cooperation to the district administration.

The Government

The District Collector reached the site within 40 minutes of the incident. Measures taken included:

- Parents were asked to identify the bodies in Kumbakonam Govt. Hospital, where special arrangements were made.
- No post mortem of bodies was done to save parents from a greater trauma.

[51] http://www.rediff.com

- The agency maintaining cremation grounds arranged for transportation of most bodies in their vehicles as well as those of Red Cross Society, free of cost.
- Special medical teams were rushed to Kumbakonam from Pondicherry and Vellore medical colleges.
- Media management was done effectively ensuring maximum possible transparency.
- 17 persons were arrested, including Chief Education Officer, District Education Officer, the teachers, former tehsildar, engineer, and staff of noon meal scheme.

NGO Cooperation

The Indian Red Cross Society played a major role in providing psychological first aid and counseling. They carried out relevant mental health outreach program such as, community cultural programs, social games, etc. in affected villages. The main objective was to foster community feelings and social support network and allowing traumatized parents to ventilate their feelings.

Corporate and Private Sector Participation

Bharat Snachar Nigam Limited (BSNL) opened free help lines at the hospitals, the very nest day. Aircell provided free cellular phones to facilitate the response and relief efforts. The Rotary Club, Red Cross Society, TVS Suzuki etc. came forward to strengthen the hands of district administration by sponsoring specific help efforts.

Relief and Rehabilitation

Compensation: The State Govt. ordered exgratia amount of Rs. 1 lac to the deceased's parents, Rs. 25,000 to those seriously injured and Rs. 10,000 to those with minor injuries. Central Govt.

also sanctioned Rs. 50,000 to parents of each deceased and Rs. 25,000 to injured. The distribution of money began the same day and was given through demand draft to ensure transparency. The money was mostly deposited in the banks in the form of fixed deposits to avoid misuse by the parents.

Infrastructural Development

Concrete houses have been built for families of those children who did not have a concrete house earlier. Nathan village lost 13 children. With aid from a nationalized bank, a concrete school building and a community centre was built in Nathan village by the district administration. A TV was also provided to deliver attention of bereaved families.

Educational Rehabilitation

Tamil Nadu had 62,000 private schools, out of which 16,000 were functioning under the thatched roofs. Within a period of 7 days all thatched roofs were removed and replaced with non inflammable and concrete material. The kitchens were separated from the school buildings. The surviving children were admitted in other schools free of cost. They were also provided with school uniforms, text books and notebooks free of cost.

Lessons Learnt/ Recommendations

District Disaster Management Plan: A comprehensive district disaster management plan should focus on multi hazard approach, preparedness and mitigation measures and institutional mechanisms for implementation of capacity building plans and better effectiveness.

Health and Mental Health Services: The implementation of district health services should be hastened to establish a proper psychiatric referral system for affected population. A counseller should be appointed in each school for psychological needs.

Capacity Building: Training teachers and students on 'dos' and 'donts' for school safety. Community awareness and out reach programs on disaster management should be conducted. Heat and fire resistance construction material be used in schools. Mock drills should be carried out in schools to ensure preparedness at all time.

Regulatory Framework

- Grant in aid code norms to be adhered to before sanctioning recognition to any new school or renewal of existing schools.
- Review of all schools built prior to 1950 and adherence t building safety rules be made compulsory for such schools.
- Issue like male-female composition of teaching staff, especially in primary schools, should be carefully considered keeping the advantage/ disadvantages.
- The school functioning in temperate climate should have 100% cotton uniform for children, especially in primary schools.

Tsunami of 26 December 2004[52]

A series of earthquakes occurred in the western coast area of Northern Sumatra, Andaman and Nicobar Islands on 26th December 2004. The epic center was more than 5.5 miles below the sea bed. The sea floor overlying the thrust fault would have uplifted by several meters as result of the earthquake. This would have forced the water upwards. A series of waves rushed in all directions and raced across the surface towards the shore line moving at 800 kmph. The speed of Tsunami initially was 750-800 kmph and when it hit the coast it was between 35-40 kmph. The height of the tsunami waves were 10 meters. The flood waters came inland from 300 meters to 2 km. The number of casualties was more than 2, 80,000 in twelve countries where it affected.

Search, Rescue and Relief in India

- Community as in other disasters was the first to response.
- District administration took 2-3 days to organize themselves as most officials themselves were affected. They however, took full control events after three days and thereafter search and rescue were in full swing.
- Armed forces took over search and rescue provided relief in Andaman and Nicobar Islands.
- Neighbouring districts administration officials came to the rescue of affected districts.
- Over 200 NGOs including international ones came for help.
- The relief initially was not organized properly. People sent old and not wanted cloths like pants, shirts, jackets. Fishermen are proud people and they did not accept old cloths. Piles of clothes on the road hindered relief works.

[52] http://www.iitk.ac.in

- General awareness about disasters was lacking aiming people.

Rehabilitation

- Most affected were fishermen community and they did not have alternate profession to fall back upon.
- Most boats and fishing nets were destroyed.
- There was requirement of over one lac boats. No Indian company could make them in short period and hence fishermen remained unemployed and could not be rehabilitated. Fiberglass boats were later procured and given to affected families. This raised their standard of living.

Reconstruction

- Most fishermen were living on Govt. or unauthorized land
- Permanent structures could come up only on acquired land which took time.
- It was decided to build multi hazard resistant houses 1-2 km from the sea coast.
- Temporary shelters were provided in situ in short period.

Constraints of Administration

- There was panic. People fled even from unaffected areas.
- Communications failed and hence it was difficult to marshal people and coordinate the rescue and relief work.
- Piling of boats/superstructures hindered search and rescue operations.
- Damage to roads and buildings caused obstruction to search and rescue teams.
- Hospitals near the coast were inundated and many wards became non functional.

- Most officials were themselves affected. It took time for them to report back for duty as they were busy looking after their families and property.
- It was a Sunday and post Christmas holiday. Most people were on leave. It took time to form search and rescue and relief teams and deploy them.
- Buses and light vehicles were available but drivers had fled away.
- Fear of another tsunami kept community away from responding. There was hold up in rescue work.
- Electricity and water supply were badly affected. Rescue was confined to day light hours. Water was however restored within 3 days and electricity within 7 days.
- Shopkeepers closed their shops due to fear of arson, which created temporary crisis.
- Everyone was surprised and caught unawares. It took some time for them to realize what had hit them. Cause and magnitude was not clear.

The most important lesson of Tsunami 2004 was capacity of India to manage natural disaster on its own. India did not seek help from any country for search, rescue and relief. It in fact helped Sri Lanka, Maldives and Indonesia in their hour of need.

CHAPTER V

A CRITICAL STUDY OF DISASTER MANAGEMENT ACT 2005

India has been haunted by series of disasters of different magnitude since years. The intensity and frequency of these disasters have increased in recent years. Examples can be drawn from the recent past when one after another disaster has shattered this sub-continent with irreparable loss of life and property. Tsunami of 2004, floods in various parts of the country and the earthquake in Jammu and Kashmir have once again raised the question of disaster management in India. India requires a long term development oriented approach to disaster risk management. Until recently, the focus had been laid on Post-disaster relief and rehabilitation. However presently philosophy emphasizes more on mitigation and vulnerability reduction and it has absolutely become necessary to strike reduction and it has absolutely become necessary to strike a balance between mitigation and disaster management.

Numerous deaths and enormous loss of property have compelled the states as well as civil society to ponder over the question- Are we well equipped to fight such emergency situation? In such a context, a welcome effort has come from the government of India. In the winter session of the Parliament, it passed a legislation known as **"The Disaster Management Act 2005".** The researcher in this chapter is trying to access the effectiveness of this ACT in combating the challenges of disasters and collateral issues.

The Government of India has decided to enact a law on disaster management to provide for requisite institutional mechanism for drawing up and monitoring the implementation of the disaster management plans, ensuring measures by various wings of the government for prevention and mitigating effects of disasters and for undertaking a holistic, coordinated and prompt response to any disaster situation. "To provide for the effective management of disasters and for matters connected therewith or incidental thereto", begins the bill... it defines 'disaster' as a catastrophe, mishap, calamity or grave occurrence affecting 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, environment, and is of such a nature or magnitude as to be beyond the copying capacity of the community of the affected area". The phrase Disaster Management is defined elaborately.

Drafting of Disaster Management Act

Interestingly the legislation defines words that may seem common. Thus **'mitigation'** means measures aimed at reducing the risk, impact of a disaster or threatening disaster situation. **Preparedness** refers to the state of readiness to deal with a threatening disaster situation or disaster and the effects thereof. **'Reconstruction'** means repair or construction of any property after a disaster. And **'resources'** includes man power, services, materials and provisions. The Act states that the phrase **'capacity -building'** includes (i) identification of existing resources and resources to be acquired or created; (ii) acquiring or creating resources identified under sub clause (1) and (iii) organization and training or personnel and coordination of such training for effective management of disasters.

The Disaster Management Act passed in 2005 provides for a detailed action plan right from the central government to the district and the local levels to draw implement and execute disaster management plans. However, it overlooks significant aspects, such as **classification of disasters, declaration of disaster prone zones, streamlining of responsibilities and involvement of local communities**. Until recently, the focus was on post-disaster relief and rehabilitation. However, the present philosophy lays more emphasis on mitigation and vulnerability reduction and it has become absolutely necessary to strike a balance between mitigation and managing disaster.

The Act is detailed in planning and execution. There are certain aspects which have been ignored like **public health**. This has detailed listing of all the government ministries and departments right till the local authorities that will be responsible for executing the provisions. But the basic lesson that all disaster situation have taught us is that without the involvement of the local people and the affected community, the implementation of any plan is not possible. Disaster prevention, mitigation, preparedness, and relief are the four essential elements of the disaster management.

"Although our country has been subjected to natural disasters from time to time, these have never been adequately factored into our planning process", laments 'India Economic Road Map the next five years 2002-2007'[53]. "By and large, we have taken the approach that these events are transient in nature and, therefore, can be addressed as and when they arise. The experience of recent years, however, suggests that even episodic shocks can disrupt the development process quite substantially unless contingency plans are already in place and fiscal and monetary fund can be adjusted with sufficient flexibility"[54].

Places that bore the brunt of the December 2004 tsunami, are now reeling under floods, fearing the next cyclone. The quake that hit is too recent to forget. Disasters have forced countries to postpone national development programmes and have contributed to worsening already precarious social, economic and environmental conditions, particularly in human settlements.[55] In the last decade, more than 200 million people were affected annually by natural disasters – seven times more than affected by conflict.

Existing Authoritative mechanism of Disaster Management:

[53] http:// planning commission.nic.in
[54] Ibid.
[55] www.unchs.org, the site of the United Nations Human Settlements Programme

In India, states are primarily responsible for handling disasters. The government of India supplements the efforts by extending logistics and financial support such as contributing to states Calamity Relief Fund (75 percent contribution by Government of India and 25 percent by the state governments) for immediate relief, restoration of essential infrastructure and the public assets in the social sector. In addition, **a National Calamity Contingency Fund** has been constituted at the central level for providing additional resources. Government of India has different nodal ministries in charge of different types of disasters: **Agricultural Ministry for natural disasters, Atomic Energy for nuclear disasters** and so on. There is a **National Crisis Management Committee (NCMC)**, under the cabinet secretary and Crisis Management Group, **(CMG)** under the central relief commissioner. Besides, a group of secretaries and high level committees can be constituted whenever required by the situations. Similarly, under the state level, there is a **State Crisis Management Group (SCMG)** headed by the chief secretary, the relief commissioners, contingency plans in the state as well as district level. Apart from that, some states have their comprehensive relief codes[56].

The government of India has adopted mitigation and prevention as essential component of its development strategy. The Disaster Management Act provides for a detailed action plan right from the central government to the district and local governments to draw, implement and execute a disaster management plan. According to the Act, **a National Disaster Management Authority will function under the chairmanship of the Prime Minister**. Similarly, the State Disaster Management, authorities will be under the chief minister and the district management, authorities under district magistrate. The national authorities would be the nodal body and lay down all the plans and policies and department heads.

[56] Economic and Political Weekly, November 23, 2002, volume 37, Issue 47, pp 4878

A mention has been made of setting up of a **National Institute of Disaster Management**, which will be engaged in research, training of personnel for disaster management, building awareness. Minimum relief is too provided in terms of medicine, shelter, food and water. Granting loans has been taken into account. It speaks of a holistic effort through various wings of the government to ensure a prompt response to disasters. A chain of experts in the field of disaster management be drawn on board in an advisory capacity.

Competence of the Act in Disaster Management at all levels:

The Disaster Management Act of India talks about the measures to be taken after the occurrence of the disaster, there is no such effective mechanism to control the spread of disasters. The best example can be the case of epidemics which often affect a considerable portion of the population. The horror of plague that swept through south-central, south – western, and northern India in 1994 is still fresh in our memory. Disease like malaria and dengue haunt metro cities like Kolkata every year. In 2005, over 1,600 people in the city were affected by dengue. Still an effective mechanism has not been drawn to flight such situations or take a proactive role to check such ordeals. Once the situation gets out of control, the blame game starts among the various departments of the government and the civic authorities. Again, in India, each year tuberculosis kills half a million people. On the whole the matter of public health has been unable to find in any space in the new legislations. The Act provides for the establishment of a number of statutory committees and authorities. The establishment of so many committees and authorities does not seem to have a strong logical foundation. There are such **overlapping duties found among various authorities in the Act that are bound to confuse people**. Further the coordination among these bodies appears to be cumbersome. So far as the constitution of the authorities is concerned, the **maximum number of members is fixed at 10**. Among the 10

members nine are to be nominated by the Prime Minister, the Ex-officio chairperson. No qualification is necessary for the members, where as in the **Gujarat Act, 2003** the members of the State authority are clearly mentioned who include the **Director-General of Police** and the **State Relief Commissioner**. Being the authority at the National Level, the eligibility for members should have been spelt out in the Act. In the context of the political scenario of our country, the appointments to the national authority can be strongly influenced by political motives. This will lead to unsuitable people being appointed to high posts.

The local authorities, who probably have a valuable role to play, are barely mentioned in the Act. There are detailed provisions regarding the functions of the different authorities, including government departments. In the case of local authorities there are no such substantive provisions, but only minor references to taking necessary measures for disaster management under the Gujarat Legislation detailed responsibilities are laid down for the local authorities.

Experience from the Disaster Management Mechanism of other countries

Many countries around the world have disaster related legislations. Several Indian states have relief codes; states like Gujarat have a specified legislation known as the **Gujarat State Disaster Management Act, 2003**[57], which came into existence after parts of the state were ravaged by an earthquake in 2001. In the light of the legislations from countries like Japan, New Zealand and Canada as well as Gujarat, the new India Legislation is reviewed here to access to what extent it is required to manage disasters. In the processes, the United Nation's Guiding Principles on Internal Displacement have also been taken into consideration.

[57] Gujarat State Disaster Management Act, 2003

The ACT refers **to disaster as a substantial loss of life and property again in section 13**, it refers to "disasters of severe magnitude" it is difficult to differentiate between these two situations. Moreover, in the second case, relief in loan repayment or fresh loans may be granted. Favoritism will certainly play its role in these aspects. **The Disaster Management Act, 2002** of **South Africa**[58] or our own Gujarat Act has detailed provisions in these areas. One of the unique feature of the South African Legislation is the addressing of the disaster as a 'progressive or sudden phenomenon'. In the context of the Indian Act, disasters are portrayed only as sudden acts. But in many cases it is progressive.

Regarding the importance of the lower strata of the administration, some instances of foreign legislation can be sited. One of the striking features under the **Emergency Programme Act of British Columbia, Canada** is the importance of decision making placed in the hands of local authorities. The local authority is empowered to declare local emergency, if it is satisfied that an emergency exist or appears imminent. Under the **Disaster Relief Act, 1947, Japan**, the prefectural governor may delegate a part of his authority for the implementation of relief activities to a head of municipality, in order to conduct relief in a speedy manner. No disaster can be ever dealt with effectively only through administrative set-up, alienating the community as a whole. But unfortunately, the Act entirely ignores this very important aspect. This Act is going to be implemented entirely through the government system. The Gujarat Act makes the community, private sector and the individual's duty bound to assist the collector or the commission in countering disasters. Inspiration can be drawn from foreign legislations.

[58] The Disaster Management Act, 2002, South Africa

New Zealand enacted the **Civil Defence Emergency Management Act, 2002**[59] to counter emergency situations including disasters. Under this Act, local authorities, non-governmental agencies, the voluntary sector, churches and community groups are involved in disaster risk management activities at both national and community levels and tied into the process through the precedential planning and agreements.

If we have a look on the Disaster Management Laws of different countries, we will find that most of them lay emphasis upon the participation of local communities and authorities of lower level to handle the disaster that has occurred. As the involvement of Central and State authorities are there but the capability o tackle the problem from a near approach is only possible with the local people of that area. But in Indian Act of Disaster Management the role that is given to the District level authorities are very few and they have to seek assistance and help from their higher authorities for any action they need to take during the situation of disaster. And it is true that, without the major involvement of local communities and authorities it is very difficult to tackle the problem of disaster. For example, in India if the tribes in Andaman could survive the tsunami, it was because their existing warning system worked well in our existent modern system. Native intelligence is significant and technical expertise needs to treat this as complementary.

Role of Courts:

The affected communities require sufficient space to voice their concern. Another significant aspect of the Act is that the action of the **National, State and District** authorities cannot be challenged except in the Supreme Court or the High Court having respective jurisdictions.

[59] Civil Defence Emergency Management Act, 2002, New Zealand

Granting the officials such a high degree of immunity encourages them to indulge in such activities which may go against the objective of the Act .In a country like India where seeking justice from the courts is very costly and time taking affair, it becomes difficult or say impossible for the affected people to go in the higher courts for their claims and ask for relief. Hence, it affects the people's right to seek justice. Conversely, it imposes punishment for false claims. Many studies even in the context of the tsunami had clearly shown that many people have been excluded on the basis of caste, religion etc. by the state in the relief and rehabilitation process. With the jurisdiction vested in the higher courts, it will create enormous difficulties for such alienated people to get their due share. Again losing documents in disasters is a common phenomenon. So, they cannot account for their lost properties. Does that mean those unfortunate losts will not get compensation and will be punished for asking the same?

As the Act has an overriding effect, it is going to be the supreme legislation in the field of disaster management. Some suggestions are:

- Declaration of disasters and or disaster prone zone and the classification of disaster is a must. Keeping constant watch and analyzing the causes can reduce the possibilities of disasters and improve the conditions of the disaster prone zone. It helps in better management of progressive disasters also. Modalities can be worked out to assign those work to various bodies referred to in the Act.
- Qualification for the members to be appointed in the national authority must e laid down. Incorporation of some experienced people outside the mechanism should be mandatory.
- The powers and functions of the various authorities and committees need to be worked out carefully so that there are not many overlapping areas.
- Creation of too many plans and policies should be avoided as far as possible.

- The entire system must have a budget of its own with provisions for accounts and audit of funds to in the Act should be provided to ensure transparency.
- Considering the plight of the people during disaster and the lackadaisical response of the authorities in many cases, the penal provisions for the false claims must be moved.
- Provisions of challenging actions of the officials only in the higher courts need to be removed. The involvement of local authorities and voluntary organizations regarding the ground level activities need to be stressed.

The emphasis of disaster management efforts should focus on the **rights of the communities and the people who live with them**. Some amendments should be made to avoid multiplicity of problems after its implementation. Finally, it may conclude that this Act won't serve its purpose and it will spell a greater disaster if there is no careful formulation of rules and regulations.

INDIA'S POLICY ON INTERNATIONAL ASSISTANCE:

India has the potential to be a catalyst for economic growth and development in an unstable region. However, poverty, rapid population growth, pockets of weak governance and health issues challenge the country. India, the world's largest democracy but for more than 50 years financial assistance and foreign aid have helped India at the time , when it is affected by the disaster. A tremendous change of policy was adopted by India when tsunami 2004, strikes this region.[60] The Prime Minister Manmohan Singh states that to the international community that, as of now we have enough resources and capability to be able to deal with this disaster. Further stated India will deeply appreciate the offer of help which have poured in from

[60] http://www.janathakshan.org

several countries, but so far we have managed on our own. We would continue be in touch with our friends in case of any requirements in future, he further stated.

It is true that we had managed as our own and huge operation has been launched for reief and rehabilitation within India. At the same time, India tried and help other countries who have affected by disaster including UC by providing expertise and exporting resources. In the case of NGOs, India only allowed the International NGOs who is working in this area to step in, the Prime Minister stated to international community that, there are several international NGOs and United Nations agencies which are already present in India, and are doing excellent work in carrying out relief operations in very close coordination with our local authorities.

From this policy adopted by our nation, we can proud that, today, it is close to attaining its primary development goal and attained tremendous gains in different fields.

CONCLUSION

In this research the researcher has dealt with the natural and manmade disasters, its legal framework and then tried to analyze the efficacy of the legal framework. To address the crisis, law needs to play a more important role with a sensitive framework in understanding the sufferings, and plight underlying the institutionalized and sudden disasters. The natural disasters are largely the result of natural phenomenon and manmade as a result of human activities and negligence affecting life, liberty and property of several persons. Natural disasters cannot be predicted with certainty so therefore can't be prevented. It would become inevitable that the State will have to arise through managing the conditions resulting such calamities to rehabilitate human beings affected by the disaster. This would require the State to proactively exercise its power and duties to rehabilitate the victims and were possible to restore their conditions which obtain before the disaster.

Private resources or skills would not be adequate for considering that disaster management is largely an effort at protecting humanity, liberty and property. Prevention is better than cure. It would become incumbent on the State to take advantage of technology and use early warning systems to prevent disasters, or at least to minimize the effects of disaster. Depending upon the kinds of disasters the Disaster Management also varies. There is no single prescription that can meet all these disasters. Unfortunately all disasters affects human beings; their lives, property and liberty. The State has the duty to do everything possible to minimize their sufferings and to put people back to their positions.

Disaster Management aims to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disasters, and achieve rapid and effective recovery. There has been increase in number of natural and manmade disasters over the past years, and

with it, increasing losses on account of urbanization and population growth, as a result of which the impact of natural disasters is now felt to a larger extent. According to the United Nations, in 2001 alone, natural disasters of medium and high range caused at least 25,000 deaths around the world, more than double the previous year, the economic losses of US $ 36 billion. These figures would be much higher, if the consequences of the many smaller and unrecorded disasters that causes significant losses at the community level were to be taken into account.

Disasters are not bound by political boundaries when it occurs and have no social and economic considerations. They are borderless as they affect both developing and developed countries. They are also merciless, and as such the vulnerable tend to suffer more at the impact of natural disasters. For example the developing countries are much more seriously affected in terms of loss of lives, hardship borne by population and the percentage of their economic loss. Almost two third of the victims of the natural disaster is from the developing countries.

There are laws for prevention, mitigation and preparedness to fight against the natural and manmade disasters occurring in any part of the world. And under the given international pressure the nation States would be bound to take cognizance of the problem and initiate appropriate action to redress the same, particularly in ensuring the implementation of the laws. The legal provisions could sufficiently and meaningfully utilized to achieve the goal of protection. What lacks is the will to implement the laws. To address the crisis of laws needs to play a more important role with a sensitive framework in understanding the sufferings, and plight underlying the institutionalized and cold bolded disasters. The black letter of law has to be utilized meaningfully in favour of needy.

The Disaster Management plans should be decentralized and integrated into the district level preparedness exercise. Panchayats, municipality and corporations have to come up with location specific plans focusing on vulnerability to hazards, prevention, mitigation and preparedness plans and a response mechanism to handle relief and rehabilitation of the affected area. At the time of preparing the rehabilitation plan residents were expected to be made as a part of the entire process, as their lives are affected. In such a situation post-disaster plans should try and create self-reliant settlements rather than creating a community of dependents with the support of relief mechanism. Local bodies will have to identify prevention, mitigation measures for each type of disaster and prepare an action plan with time schedule, based on availability of the resources. They are also required to generate private and institutional support for prevention, preparedness and mitigation.

SUGGESTIONS

- Creation of awareness for disaster reduction is urgently needed amongst policy makers, decision makers, administrators, professionals (architects, engineers and others at various levels) financial institutions (banks insurance, house financing institutions) and NGOs and voluntary organizations.
- The district plan should involve the establishment of an emergency control room and setting up of shelters and other facilities to accommodate affected people. It also calls for preparing community to deal disasters and a system to impart training to identify functionaries. Arrangement should be made for inter-state sharing of resources to be incorporated in State ministry of home affairs/state governments.

- Create awareness for improving preparedness amongst the communities, using media, and education. Appropriate amendments in the legislative and regulatory instruments (state levels, master plans, development area plan rules, building regulations, and byelaws of local bodies) should be made along with strengthening of the enforcement mechanism at different levels.
- Recreating lively hoods is essential to disaster recovery. By providing small scale loans to women for purchasing livestock and starting small businesses. Granting sewing machines and livestock that generate income for recipients and should serve as source of pride. Develop community based institutions that support local business activities.
- To respond effectively, disaster systems must be in places that allow decisions to be made, communication to flow, technical expertise to be executed, resources to be allocated and actions synchronized.
- The government should make plans in post disaster period and after making plans they should make an effort to consult the community before finalizing rehabilitation and other post disaster plans. The community should also play an important role in the entire process.
- To promote the study of natural disaster prevention, mitigation, and preparedness and to create detailed data base on hazards occurrences, damage caused to buildings and infrastructure and the economic losses suffered and ensure its accessibility to interested researches for effective analysis of cost of disasters and benefit of mitigation plan. To devise appropriate policy instrument and finding support for urgent disaster preparedness and prevention actions in high risk areas including upgrading the resistance of existing housing and related structures and systems.

- Enablement of affected population. People who faced hazards should be assisted to manage their own environments more responsibly and equitably over the long term by joining in a global structure that supports informed, responsible, systematic actions to improve local conditions in vulnerable actions.
- The disaster prevention, mitigation, preparedness and relief are the four elements which contribute to and gain from the implementation of the sustainable policies. So the government should incorporate them in their developmental plans and snsure efficient follow up measures at the community, sub-regional, regional, national, and international level.
- The disaster prevention and mitigation should be aimed at building up the capacities of the community organizations, and government functionaries at all levels by considering the vast population and the geographical area of the country. The ultimate goal is to make prevention and mitigation a part of normal day to day life.
- The recent experience also shows that during the rescue and relief operations, political leaders and VIP should be kept away from the affected areas as it deflect attention from relief work. Senior officials of the State administration should remain in their offices for coordinating the activities of the affected areas. VIP movements have really hampered the relief work as attention was delivered for security and other requirements.
- A rapid action force should be there always to address the problem of immediate rescue and relief operation to be in place to begin relief efforts without any delay.

The disaster prevention, mitigation, and preparedness are better than disaster response in achieving the goals and objectives of vulnerability reduction. These measures should work hand in hand for vulnerability reduction and rapid professional responses to disasters. Disaster

response alone is not sufficient as it yields only temporary results at the very high cost. Prevention and mitigation contribute to lasting improvement in safety and are essential to integrated disaster. An efficient disaster management should focus on trying to minimize the damage of life and property before the event.

Under the circumstances it becomes the duty of the nation states to see that the problem is resolved and they are obliged to extend the much needed relief and rehabilitation support for the same. The international legal instruments could be used as 'soft law' to help the 'nation under crisis' in capacity building and ensuring that effort at national and subordinate level thereof are made to effectively reduce the burden. Thus, a transnational coalition to fight the situation seems to be inevitable.

In India, we have the first few but significant steps towards vulnerability reduction, putting in place prevention and mitigation measures and preparedness for a rapid and professional responses. With a massive awareness generation campaign and building up of capabilities as well as institutionalization of the entire mechanism through a techno legal financial framework, we are gradually moving in the direction of sustainable development.

Our vision 2020 is to build a safer and secure India through sustained collective efforts, synergy of national capacities and people's participation. What looks a dream today will be transformed into reality in the next two decades. This is our goal and we shall strive to achieve this goal with a missionary zeal. The path ahead, which looks difficult today, will become a lot easier as we move along together.

Disaster Management has to be multi-disciplinary and proactive approach, in this the central government, the community, civil society organizations and media also have a key role paly in achieving our goal of moving together, towards a safe India and for that, development projects should be sensitive towards disaster mitigation. Our mission is vulnerability reduction to all types of disasters, it may be natural or manmade. This is not an easy task to achieve, keeping in view the vast population, and the multiple hazards to which the country is exposed. However, if we are firm in our conviction and to resolve that the government and the people of this country are not prepared to pay the price in terms of massive causalities and economic losses, the task though difficult, is achievable and we can achieve it.

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