CHAPTER -I
INTRODUCTION

Asia the most disaster prone region covers 61 per cent of the world's population devastated to loss of life and impact socio-economic development, political and cultural state of the affected area. Colossal and array with varieties disaster trigger over 70 per cent of all lives lost due to disasters occur within the Asia Pacific region. Among the natural hazards that annually impact the region, flood and cyclone is known to be the most destructive to property, crops and infrastructure, and one of the worst for causing death and injury. The need to combat the perennial problem of floods and the resultant destruction has been at the forefront of concern for most Asian nations. In view of the increasing vulnerability of the Asia and Pacific region to disasters, disaster risk reduction appears as the unique long-term viable solution to reduce the impact of disasters and build the resilience of communities and nations to disasters.

MEANING AND DEFINITION

The root of the word ‘disaster’ implies that when stars in a bad position, a disaster is about to happen. The Latin pejorative dis and astro, a star (L.aster), creating the Italian ‘disastro’, which came into the English language in the 16th century through the French word désastre. It is a combination of two terms des and aster, meaning bad or evil and star (Oxford Dictionary). ‘Disaster’ therefore implies loss or damage occurring due to some unfavorable star.1

According to the Webster dictionary disaster means ‘a grave occurrence having ruinous results.2 Ecological imbalances and global warming issues along with unplanned development place the world at a greater risk of facing disaster. More areas and increased number of people are becoming vulnerable to these disasters in

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As far as the natural environment is concerned, in contrast with the communities, it is practically always jeopardized by the potential impact of physical agents both on inhabited or uninhabited territories. From this viewpoint, any “disaster” should be considered as ecological because others simply do not exist. Another definition for disaster is the impact of a natural and man-made event that negatively affects life, property, livelihood or industry often resulting in permanent changes to human societies, eco-systems and environment. The term is also defined as “a serious disruption of the society causing widespread human, material and environmental loss which exceeds the ability of affected society to cope on its own resources”.

Social disruption may take different forms. For example, the impact of a geological agent like earthquake might be disruptive because it produces sudden anticipated losses of human and physical resources. The disruption of a biophysical agent (e.g., a famine) arises from the slow deterioration of human energy may have a subtle but cumulative negative effect on the economic institutions. These effects could not be identified at a particular point of time but would have to be determined by the earlier reference to baseline data on health and economic status of the community. Also the nature of disruption would vary depending on whether the agent leads to civil strife and similar disturbances or to natural or man-made disasters.

Disasters are complex and quintessentially social events, reflecting not so much uncontrolled brute forces as the interaction of hazards and natural events with social structures and political. A disaster is a sudden and unexpected calamity resulting in the disruption of normal life, dislocating the infrastructure, badly affected the internal survival strength of the society and making it dependent on the external help.

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Disaster is also defined as “an event concentrated in the same time and space, in which a community undergoes severe damages 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”. This definition is useful as it shifts the meaning away from the purely physical aspects to an emphasis on the human community. Some communities at high-risk areas develop so-called disasters sub cultures include norms as to how threats are to be perceived and how warning cues are to be interpreted and a technology on how to respond. Thus, such communities on a routine basis are able to deal with agents that are previously and in other communities would be considered “disastrous”.

The World Health Organization (WHO) defines disaster as “any occurrence that causes damage, economic destruction, loss of human life and deterioration in health and health services on a scale sufficient to warrant an extraordinary response from outside the affected community or area”. In modern times the term ‘disaster’ is defined as any odd event whether natural or man-made, bringing about sudden and great miseries to humanity at large scale extending over a period of time. It also signifies misfortune at larger scale or calamity of considerable amount for a section of humanity. These calamities have sudden destructive impact of distress over an extended period. Every disaster has a particular origin and probable target to be affected. A hill terrain is more susceptible to landslide than a plain land. Similarly, a coastal area is more prone to cyclone disaster than a non-coastal area.

CLASSIFICATION OF DISASTER

Different authors have different ways of classifying disasters. The first type of classification of disasters is- i) natural, such as flood, drought, cyclone and earthquakes and ii) man-made such as riots, conflicts, fire, epidemics, industrial accidents and environmental fallouts. Often the difference in the outcome of both

kinds is marginal. The second classification is natural, human made and policy disasters. These disasters are further classified into major disasters and minor disasters. It is not just the damage destruction potential that defines a disaster as major or minor but categorization depends on the measurement of the occurrence of the particular disaster. Policy disaster includes situations such as a lack of rational policies to restrict the sale of hazardous and harmful drugs, free sale of tobacco and liquor, banned pesticide and excessive displacement of people for developmental projects. These disasters are caused by the negligence on the part of the policy makers.11

The third way of classification which is based on the origin of a particular disaster is i) Exogenous (flood, droughts, storms, landslides, and avalanches) ii) Endogenous (volcanism, earthquakes) iii) Anthropogenic iv) Collapse of structures (dams, dykes, buildings) v) Land degradation vi) Population growth and vii) Fires. The intensity of the occurrence of the disasters mentioned above generates the consequences like famine / starvation / malnutrition, escalating poverty, reduced water availability, mass migration, deaths and conflict.12

To reduce or mitigate the above consequences, the disasters should be managed efficiently before, after, and at the time of disaster. How the different types of disasters are managed at Regional, National and global levels are presented below.

DISASTER MANAGEMENT

Disaster Management is the discipline of dealing with and avoiding risks, it is a discipline that involves preparing, supporting and rebuilding society when natural or man-made disasters occur. Disaster management is the continuous process by which all individuals, groups, communities manage hazards in an effective manner to avoid or ameliorate the impact of disasters resulting from the hazards.13 Action taken depends on the part of perceptions of risk of those exposed. Effective disaster management relies on thorough integration of emergency plans at all levels

11 Care India, Care India Disaster Response Planning Guide, New Delhi, 1999, p-8,9.
12 Ibid.
(individual, groups, community) should not affect the other levels.\textsuperscript{14} It is common to place the responsibility for governmental emergency management with the institutions for civil defense or within the conventional structure of the emergency services.

Disaster management can be defined as “the range of activities designed to maintain control over disaster and emergency situations and provide a frame-work for helping the persons at risk to avoid or recover from the impact of the disaster”.\textsuperscript{15}

Comprehensive disaster management is based on four distinct components: mitigation, preparedness, response, and recovery. Effective disaster management utilizes each component in the following manner (1) Mitigation involves reducing or eliminating the likelihood or consequences of a hazard, or both. Mitigation seeks to “treat” the hazard such that it impacts society to a lesser degree.(2) Preparedness involves equipping people who may be impacted by a disaster or who may be able to help those with the tool to increase their chance of survival and to minimize their financial and other losses.(3) Response involves taking action to reduce or eliminate the impact of disasters that have occurred or are currently occurring, in order to prevent further suffering, financial loss, or a combination of both. Relief, a term commonly used in international disaster management. (4) Recovery involves returning victims’ lives back to a normal state following the impact of disaster consequences. Actions taken during the period following the emergency phase is often defined as the recovery phase, which encompasses both rehabilitation and reconstruction. The recovery phase generally begins after the immediate response has ended, and can persist for months or years thereafter.\textsuperscript{16}

Mitigation efforts attempt to prevent hazards from developing into disasters altogether, or reduce the effects of disasters when they occur. The mitigation phase differs from the other phases because it focuses on long-term measures for reducing


\textsuperscript{16} Ibid.
or eliminating risk.\textsuperscript{17} The implementation of mitigation strategies can be considered a part of the recovery process if applied after a disaster occurs. However, even if applied as part of recovery efforts, actions that reduce or eliminate risk over time are still considered mitigation efforts.\textsuperscript{18} In the preparedness phase, emergency managers develop plans of action when the disaster strikes.\textsuperscript{19} Common preparedness measures include the proper maintenance and training of emergency services, the development and exercise of emergency population warning methods combined with emergency shelters and evacuation plans, the stockpiling, inventory, maintenance of supplies and equipment, and the development and practice of multi-agency coordination. Another preparedness measure is to develop a volunteer response capability among civilian populations.\textsuperscript{20}

The response phase includes the mobilization of the necessary emergency services and first respondents in the disaster area, such as firefighters, police, volunteers, and non-governmental organizations (NGOs).\textsuperscript{21} Recovery efforts are primarily concerned with actions that involve rebuilding destroyed property, re-employment, and the repair of other essential infrastructure.\textsuperscript{22} Post-disaster management involves many problems like law and order, evacuation and warnings, communications, search and rescue; fire fighting, medical and psychiatric assistance, provision of relief and shelter.\textsuperscript{23}

Disaster management is very much an ongoing national requirement, important to governments and people alike. It has special significance today because of

\begin{itemize}
  \item \textsuperscript{17}Ibid.
  \item \textsuperscript{18}Quaranrelli, E.L., \textit{Emergent Citizen Groups in Disaster Preparedness and Recovery Activities}, Reports on disaster, Delaware Disaster Research Institute, Delaware, 1984. p-9.
  \item \textsuperscript{19}Ibid.
  \item \textsuperscript{20}Madan Kumar Jha, \textit{Natural and Anthropogenic Disasters: Vulnerability, Preparedness and Mitigation}, Springer, New Delhi, 2010, p-14.
  \item \textsuperscript{21}Ibid.
  \item \textsuperscript{23}Ibid.
\end{itemize}
increasing dangers to the national environment posed by natural hazards and their effects on economic development.24

INTERNATIONAL CONTEXT OF DISASTER MANAGEMENT

On December 11, 1987 the United Nations General Assembly declared the 1990’s as the “International Decade for National Disaster Reduction” (IDNDR). The stated mission of IDNDR was to improve each United Nation member countries capacity to prevent or diminish adverse effects from natural disasters and to establish guidelines for applying existing science and technology to reduce the impact of natural disaster.25 Its basic Objective was to decrease the loss of life, property destruction and social and economic disruption caused by natural disasters, such as earthquakes, tsunamis, floods, landslides, volcanic eruptions, droughts, locust infestations, and other disasters of natural origin. On December 22, 1989, through UN Resolution 44/236, the General Assembly set forth the goal they wished to achieve during IDNDR. Also to establish a special UN office in Geneva to coordinate the activities of the IDNDR, the resolution called upon the various UN agencies to,

1. Improve each country’s capacity to mitigate the impact of natural disasters
2. Guidelines and strategies for existing technological and technical knowledge.
3. Foster scientific and engineering to reduce loss of life and property.
4. Disseminate technical information for mitigation of Natural disasters.
5. Develop the assessment of natural disaster through technical assistance and technological transfer, demonstration project, education and training tailored to specific disaster and locations, and to evaluate the effectiveness of those programs. (United Nations, 1989).26

Disaster Management became global and financial resources along with the establishment of numerous associate and consortium organizations sprang up. Mass media took up the cause with every major and minor “disaster” reported worldwide.

Disaster myths were created and perpetuated by the mass media. Until this global agenda was declared, environmental issues were still in their infancy and the number of research or consulting organizations focused on disasters were extremely small.²⁷

The establishment of disaster research units (mainly university-affiliated) and disaster management units in public administrations only became visible in the second half of the century (the late 1950s). By 2000, the number of disaster related organizations, had grown exponentially. The US government alone has fewer than twenty six major agencies and dozens of regional offices related to disasters. And additional ninety-five specialized units for differing disaster situations and eighty US nongovernmental organizations (NGOs).²⁸

The distribution of disaster-related global-based agencies (NGOs and public) likewise grew, composing over ninety major public agencies with offices throughout the world. This pattern of globalization in disaster management also strengthened the hold of public administration in the area of disasters. It has also led to typical interagency conflicts and problems of coordination, as well as territorial imperatives, turf wars (International Federation of Red Cross, 1997) and competition. At the nation-state-level the public administration apparently dominates the definition of disasters, who was qualified to be a disaster victim, what help would be afforded, and so on, was now extended at the global level by other forms of public administration in different guises. As several critical reports have noted, the results have been at the same mediocre levels of disaster management (on a large scale), where in some cases, such assistance was more detrimental than helpful.²⁹

To be effective, disaster management should be implemented as a comprehensive and continuous activity, not as a sporadic or knee jerk reaction to individual disaster circumstances. It needs to be intricately linked to the national development agenda.

India supports one-sixth of the world’s population on just 2% of its landmass. It suffers heavily from natural disasters of every shade and description that hits the poorest of the poor and which is why the considerations of disaster safety deserve prime attention. In the Pre-National Disaster Management Act Era in India captured national imagination because of famines, and the periods of food scarcity usually inflicted untold misery on approximate 50 million people annually. In 1878, a Scarcity Relief Division was setup in the time of British by the then Agriculture ministry, in order to address famine. Eventually, in 1883, a Famine Commission was constituted, and it was then the first famine code was promulgated by the Government.

A Central Sector Scheme on Natural Disaster Management Programme (NDMP) was implemented for the first time in December 1993. The main objective of the programme is to enhance the national capability for disaster reduction, preparedness and mitigation. The programme is also expected to enhance the level of awareness of the community about the disasters they are likely to face and prepare them adequately to face the crisis situation. The major components of the programme are: i. Human Resource Development, ii. Activities under IDNDR. iii. Research and consultancy services. iv. Documentation of major events, v. Strengthening of NDM Division, vi. Establishment of National Central for Disaster Management (NCDM) at the Centre and Natural Disaster Management Faculties in States.

The major achievements of the programme are: i. Setting up of the National Center for Disaster Management in the Indian Institute of Public Administration, New Delhi, 1995, ii. Setting up of separate Disaster Management Faculties in Training Institutes in 16 out of 25 States in the country. iii. Documentation of major events like Uttarkashi and Latur earthquakes, research studies on land-slides in Kerala and Sikkim, drought in Rajasthan and cyclone mitigation in Andhra Pradesh.

30 NIRD, Training on Community Based Disaster Management, Centre for Agrarian Studies and Disaster Mitigation, Hyderabad, 2005, p-16,17.
v. Organizing and sponsoring training programmes and seminars on various aspects of natural disaster management.  
vi. Public education and community awareness campaign through Newspapers, postal stationery, observation of World Disaster Reduction Day and through films.  
vii. Reprinting of 45000 copies IDNDR publication for children in English and Hindi for distribution among school children.

Under India’s National Disaster Management framework, the Ministry of Home Affairs is the central government’s nodal agency for disaster management. Other national-level ministries that are involved include Health, Water Resources, Environment and Forestry, and Agriculture. At the state level, disaster management departments are being created. At the district level, disaster Management committees are being formed. Under the UNDP’s Disaster Risk Management Program, 28 districts will be assisted in the development of village-based disaster management committees and teams, which will be made up of local volunteers.

The Indian government’s National Disaster Management Program stems from the findings of the High-Powered Committee on Disaster Management (HPC), which was formed in 1999.  

**HIGH POWERED COMMITTEE**

In 1999, High Powered Committee (HPC) was set up by the Prime Minister of India under the Chairmanship of Shri J.C. Pant. The report submitted by this committee to the Government of India in October 2001, outlined the huge scope for Disaster Management by listing some three dozen different types of disasters India must be prepared for. These had been placed in five categories, namely, water and climate related disasters, geological disasters, chemical, industrial and nuclear disasters, accidents and biological disasters.

Initially, the HPC’s mandate was to analyze India’s vulnerability to natural hazards. Later it was expanded to include both natural and manmade disasters.

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31 This paper was presented in the Annual Conference of Relief Commissioner of States/UTs on 26 May 2000 in Pune by Shri J.C. Pant, Chairman, High Powered Committee.
HPC in its October 2001 report suggested that a separate ministry for disaster management might be created in a phased manner with appropriate instrumentalities. HPC further recommended a Cabinet Committee on Disaster Management for a National Council on disaster management, assisted by a Working Group. The committee’s report was a comprehensive document that proposed a model National Calamity Management Act, state disaster management acts, possible structures and locations for key institutions, guidelines for state and district disaster management plans, and contents for the National Disaster Response Plan.

**NATIONAL CALAMITY MANAGEMENT ACT**

National Calamity Management Act, 2002 was an Act to ensure the efficiency and effective management of natural and other calamities, to achieve a greater co-ordination and responsiveness in respect of prevention and mitigation of disaster arising out of such calamities and to provide better relief and rehabilitation for the victims of such disasters and for matters connected therewith or incidental thereto. It was enacted by the Parliament in the 53rd year of the Republic of India.

Based on the recommendations of the committee and further deliberations, responsibility for disaster management was shifted to the Ministry of Home Affairs (MHA) in 2002. This also involved a shift in focus from relief and rehabilitation to prevention, preparedness, and mitigation. According to one key source, the MHA has carried out a comprehensive review of all existing disaster management policies, mechanisms, and capabilities. All Indian states were advised to enact disaster management laws and to convert their relief codes into disaster management codes. A National Emergency Management Authority was established and disaster management bodies were created at the state level. Numerous activities-information management, institution-building, capacity-building, infrastructure development, and procurement of state-of-the-art technologies were made to this ambitious effort to revamp and strengthen the disaster management throughout India.

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NATIONAL DISASTER MANAGEMENT ACT

A committee was constituted on 11 January 2005 by the Government of India to draft the Disaster Management Bill. The Bill was introduced in the Rajya Sabha on the 11 May 2005. It was referred to the Parliamentary Standing Committee for examination and report. The report was presented to the Government of India on 25 August 2005. Rajya Sabha passed the Bill with amendments on 28 November 2005 and Lok Sabha did so on the 12/13 December 2005. President of India signed the Bill on the 23 December 2005 and finally the BILL was passed as the National Disaster Management Act. The National Disaster Response force was also constituted on 29 November 2005.

National Disaster Management Act of 2005 brings about a paradigm shift in India’s approach to disaster management. The centre of gravity stands visibly shifted to preparedness, prevention and planning simultaneously as the national disaster response is improved. The new Act provides the following framework:

• There shall be a National Disaster Management Authority of which the Prime Minister of India will be the Chairperson, assisted by a Vice Chairperson

• There shall be a creation of State Disaster Management Authorities, expected to be chaired by the Chief Minister of the State.

• There shall be a creation of District Disaster Management Authorities, co-chaired by District Collector and President of the elected body of the district.

• There shall be an institution to study and do research in science and develop technologies to manage the disasters

• There shall be disaster management funds available to the union, State and District authorities to meet the immediate needs of providing rescue and relief to the victims of Disasters.

In the new scheme of things, enhanced role of local bodies in Disaster Management is envisioned. The Disaster Management Chain extended to Panchayats with the objective to ensure the involvement of local government, who are usually the first responders, at the grass root level. Thanks to the 73rd & 74th constitutional amendment Acts (1992 & 1993) asking all States to promulgate their own new Acts or amend old ones by April 1994.

The 73rd amendment covered land improvement, land reforms, soil conservation, rural housing, rural electrification, education, public distribution system and maintenance of community assets. Recognition of the need for women and members of the scheduled caste to contribute to governance was one of the most significant moves. The 12th Schedule of the 74th constitutional amendment act of India defines 18 new tasks in the functional domain of local urban bodies including urban planning including town planning, regulations of land use and construction of buildings, planning for economic and social development, public health, sanitation, fire services, slum improvement and up gradation etc. It, inter alia, directs every State to constitute two committees, namely the District Planning Committee and a Metropolitan Committee.

It would be important to recall that with the entry of computers at the district level and GIS during late 1980’s, local authorities are being empowered. They will not only have effective vertical linkage but much better capacity to manage the information and change. It was the Hanumanth Rao Committee (1984) that emphasized the need for efficient data management in the context of efficient local level planning and decision making. A chapter on Disaster Management also entered in to the Tenth Five Year Plan prepared by the Planning Commission of India. Realization increased so much that the terms of reference of the twelfth Finance Commission were changed to include concerns of Disaster Management.

The Government of India is a member of various international organizations in the field of disaster response and relief. While, as a policy, no requests for assistance or appeals are made to the international community in the event of a disaster, assistance offered suo moto is accepted. Linkages exist with the following
organizations: a) UN Office for Coordination of Humanitarian Affairs (UN OCHA), which has been made responsible by UN General Assembly mandate for all international disaster response. b) United Nations Development Programme (UNDP), responsible for mitigation and prevention aspects of disaster management. c) UN Disaster Assessment and Coordination (UNDAC) System.34

In the recorded history of cyclones, more than a million lives have been lost in India. About half of the Indian boundary is surrounded by ocean and approximately 40% of total population lives within 100 km ocean coast. The people living in the coastal regions of India are highly vulnerable to natural hazards such as cyclones. A GIS based analysis, by Sheikh M. Nazmul Hossain and Ashbindu Singh of the USGS EROS Data Center shows that an estimated 54 million people in 20 states are extremely vulnerable to cyclones. Using per capita income as a measure of coping capacity of the states and combining it with storm risk they conclude that Orissa is the most vulnerable state, followed by Tamilnadu, Andhra Pradesh and West Bengal. Maharashtra and Goa are less vulnerable because of better per capita income.35

Flood has always been a recurrent phenomenon in India. With more than 12 per cent of the total land area in India prone to flood it is necessary to understand the concept of flood. Floods are common and mostly natural disasters. When rivers overflow their banks they cause damage to lives, property, infrastructure and crops. Floods are common and mostly natural disasters. Floods usually are local, short-lived events that can happen suddenly and sometimes with little or no warning. They usually are caused by intense storms that produce more runoff than an area can store or a stream can carry within its normal channel. River Flood, Coastal Flood, Urban Flood, Flash Flood, Ice Jam are the different types of floods.36

Rivers can also flood its surroundings when the dams fail, when ice or a landslide temporarily block the course of the river channel, or when snow melts

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34 Damon P. Coppola, 2007, p-384.
35 Gauthamadas U., India's Vast and Vulnerable Coast, AIDMI, Academy for Disaster Management Education Planning and Training, Chennai, 2006, p-6,7.
36 http://wrmin.nic.in.
rapidly. In a broader sense, normally dry lands can be flooded by high lake levels, by high tides, or by waves driven ashore by strong winds. Small streams are subject to floods (very rapid increases in runoff), which may last for a few minutes to a few hours. On larger streams, floods usually last for several hours to a few days. A series of storms might keep a river above flood stage (the water level at which a river overflows its banks) for several weeks.

**TYPICAL EFFECTS OF FLOOD AND CYCLONE**

**Physical damage** – structures damaged or collapsed by washing waters, landslide triggered on account of water getting saturated. Boats and fishing equipments may be lost or damaged in coastal areas.

**Casualties and public health** – people and livestock deaths caused by drowning, very few serious injuries. Outbreak of epidemics, diarrhea, viral infections, malaria, etc.

**Water supplies** – contamination of water (wells, ground water, and piped water supply). Clean water may be unavailable.

**Crops and food supplies** – sudden food shortage can be caused due to loss of entire harvest, spoiling of grains when saturated in water along with loss of animal fodder. The crop storage facilities and godowns may get submerged resulting in immediate food shortage. Floods may also affect the soil characteristics; the land may be rendered infertile due to erosion of top layer or may turn saline if sea water floods the area.

**Hazard Zones**

The Vulnerability Atlas of India shows pictorially the areas liable to floods. The flood hazard map is based on the Flood Atlas of India brought out by the Central Water Commission, state wise marking both the areas which are liable to flooding as well as those which have been protected. The maps given in the Vulnerability Atlas 37  [www.nih.ernet.in](http://www.nih.ernet.in)  
38 [www.cwc.nic.in](http://www.cwc.nic.in).
of India show the district boundaries and the location of the district towns along with the rivers district wise identification of vulnerable areas.

Besides the problems of flooding in the river plains, heavy intensity rains could cause local flooding in certain areas where the drainage is either naturally poor or the drains are choked due to various reasons such as careless dumping of refuse in the drains and lack of maintenance. Much of the flooding in the towns and cities occur due to such cases. Under cyclonic winds in coastal areas, the sea coast of India can be flooded due to heavy down pour on the one hand and storm surge on the other. The depth of inland water inundation could be worked out by taking the storm surge heights.

According to the High Power Committee Report of Government of India, around 75% of the total rainfall is concentrated over 4 months of monsoon (June – September). Around 12% of the country’s land area is prone to floods which means around 40 million hectares are prone to flood and annually on an average 8 million is affected by floods. The most flood prone are the Brahmaputra, Ganga and the Meghana basins. The states are Uttar Pradesh, Bihar, West Bengal, Assam and Orissa. But of late floods have also become a serious affair in the states of Andhra Pradesh and Gujarat. India accounts for one- fifth of the global death count due to floods. Over 30 million people are displaced annually.

SIGNIFICANCE OF THE STUDY

Disasters are particularly frustrating because the knowledge that is needed to reduce their impacts, to improve lives and reduce harm, is not in hand. The challenge is in the successful translation of knowledge into action. Tropical cyclones are the most costly disasters worldwide. Earthquakes are a close second, but cyclones affect more people and more places. Damages due to cyclones have increased at a rate that far exceeds any trends in the occurrence or intensity of the storms themselves. This results from growing development in exposed coastal locations. Inland flooding from this phenomenon is a growing threat as well. A long-term perspective is necessary for the development of effective preparedness which will help to mitigate the intensity of disaster. Similarly the state of Tamilnadu is also facing natural disasters including
flood and cyclone disasters. The impact is phenomenally increasing each year in terms of destruction of physical and economic infrastructure of the society.

Several studies have been undertaken to study the disaster management by various research institutions, government agencies, non-governmental organizations and research scholar but lesser attention has been given for the flood and cyclone disaster management in Tamilnadu though the vulnerability for this type of disaster is jeopardize to the society. The government and NGOs have adopted various welfare measures and social sustainability and economic development in the affected areas but these measures do not fulfill their overall needs especially the most vulnerable group. World Vision is one of the most prominent organizations which plays a vital role in disaster management in Tamilnadu and also focuses on the most vulnerable group like women and children.

Therefore the researcher has chosen this topic to study the “Flood and Cyclone Disaster Management in Tamilnadu with special reference to World Vision India.”

**METHODOLOGY**

The study is a descriptive and analytical study based on primary and secondary data collection. Both primary and secondary data have been collected for investigating the objectives framed for the present study. The secondary sources of data have been collected from the Books, Journals, Annual Reports, Publications, and Manuals. The secondary data relating to Tamilnadu profile, amount of Flood and Cyclone disaster management in Tamilnadu have been collected from World Vision-India, United Nations/UNDP and on-line reports of Tamilnadu Government in the research area.

The descriptive research includes fact-finding inquires and the impact of the disaster management in the target areas. The analytical research on the other hand the researcher had used facts already available and analyses these to make evaluation of the material of Disaster Management of World Vision India.
Sample Size and Area

The researcher had collected from 300 samples of respondents in the targeted area. Among these three hundred samples seventy five had been taken from each district viz., the Perambalur District, Chennai District, Thiruvarur District and Kancheepuram District. For the research purpose the researcher has chosen certain blocks which are considered as flood and cyclone prone areas- Perambalur, Kancheepuram, Thiruvarur, and Chennai districts of Tamilnadu.

TECHNIQUES OF DATA COLLECTION

PRIMARY SOURCE OF DATA

The questionnaire was designed to elicit information on the role and performance of World Vision in disaster Management in the flood and cyclone prone areas for the study. The questionnaire involves four important stages of disaster management in the study area. They are: 1) Mitigation, 2) Preparedness, 3) Relief, 4) Rehabilitation and reconstruction. The researcher also used qualitative and quantitative methods in the questionnaire with open-end questions and closed-end questions. The closed-end questions were in line with Likert’s three point scaling system.

To provide necessary information about the role and functions of World Vision of Flood and Cyclone Disaster Management in Tamilnadu the researcher conducted interviews with about 50 respondents through unstructured interview from the various stakeholders which includes dignitaries of Non-governmental Organizations and governmental Organizations in order to bring case studies for the measures and implications of disaster management adopted in the state of Tamilnadu. This aspect of the study included literature and website review, interviews, and a survey of Area Development Programs and Institutions by means of targeted e-mails to named individuals.

SECONDARY SOURCE OF DATA COLLECTION

Secondary source of data were collected from publications of the Central, State and Local governments, published materials from various books, journals,
magazines, daily newspapers, website review. The data from non-governmental organizations and research institutions were also used as secondary source of data.

**ANALYSIS OF DATA**

The total of 300 samples, from among the community of the target areas (flood and cyclone prone areas) were selected at random. Data collected from the respondents were entered into a personal computer and a commonly used package SPSS (Statistical Package for Social Sciences Version 18) was used to analyze the data. Some of the statistical tools used for the analysis include

i) Summary statistics, frequency tables, one way, two way and multiple way tables.  
ii) Tests such as Binomial Test, Chi-square, t-test, One way Analysis of Variance (ANOVA), Cluster Analysis, Discriminant Analysis were being used.

**Parametric tests** (ANOVA, t-test) have been used to compare the data given by the respondents. t-test is any statistical hypothesis test in which the test statistic follows a t-distribution if the null hypothesis is supported. It is most commonly applied when the test statistic would follow a normal distribution if the value of a scaling term in the test statistic were known. When the scaling term is unknown and is replaced by an estimate based on the data, the test statistic (under certain conditions) follows a t-distribution. ANOVA gives a statistical test of whether the mean of several groups are all equal, and therefore generalizes two sample tests to more than two groups. One-way ANOVA is used for differences among two or more statistically independent groups.

**Non-parametric test** (Chi-square and binomial test) used on the demographic data of the respondents to verify whether the sample respondents are evenly distributed across the different categories in each of the demographic items. Chi-square test is a statistical test used to examine differences with categorical variables or it is a statistical test commonly used to compare observed data with data we would expect to obtain according to a specific hypothesis. It is used to estimate how closely an observed distribution matches an expected distribution. This is referred as the goodness-of-fit for estimating whether two random variables are independent. The measure of Chi-square is the square of the difference between observed and expected
frequencies divided by the expected frequency. The degree of freedom is observed for the more than two groups and three-point scaling, a simple rule is that the degree of freedom is equal to the number of rows minus one multiplies by the number of column minus one and not counting the total number of rows and columns. The significance test measures the observed association between the independent variables and dependent variables is caused by chance. A Chi-square of 0.05 is conventional accepted threshold of statistical significance; values less than 0.05 are commonly referred to a statistically significant. If the significant value is less than 0.05, the null hypothesis is rejected.

The binomial test is useful for determining the proportion of people in one of the two categories is different from a specified amount. Binomial test is conducted when there are two possible outcomes. It is an exact test of the statistical significance of deviations from a theoretically expected distribution of observations into two categories. This test is also done for the qualitative data. If the significant value is less than 0.05 then it could be assumed that the samples are not evenly distributed.

LIMITAION OF THE STUDY

• The result of the study depends upon the information furnished by the community. Hence the information provided by them is subjected to personal bias also due to their personal issues.

• Owing to the time constrain the study focuses only to four districts namely Kancheepuram, Thiruvarur, Chennai and Perambalur. However, to understand a comprehensive study of Disaster Management it is essential to take up the similar projects in other districts also.

REVIEW OF LITERATURE

The book “Disaster Management in libraries and museums” edited by Graham Matthews, Yvonne Smith and Gemma Knowles assesses the current state of

39 http://www.graphpad.com/quickcalcs/binomial1.cfm
Disaster Management in archives, libraries and museums in the UK and around the world, and provides recommendations for addressing current and future threats. The research is the first study of a cross-domain nature in this book that provides an overview of the sector, the individual domains, as well as an international perspective.40 The book “Management of natural disasters in developing countries” by H. N. Srivastava and G. D. Gupta, is based on the modern needs of government and nongovernmental organizations involved in one or more of the four phases of emergency management—mitigation, preparedness, response and recovery. Contributed seminar papers presented at the International Workshop on Management of Natural Disasters during, 24-27 Jan. 2000 at Bangkok.41

The book “Introduction to International Disaster Management” by Damon P. Coppola is written from a global perspective on risk, hazards, and disasters, Introduction to International Disaster Management provides practitioners, educators and students with a comprehensive overview of the players, processes and special issues involved in the management of large-scale natural and technological disasters. The book discusses special issues encountered in the management of international disasters, and explains the various private, non-governmental, national, and international agencies that assist in preparedness, mitigation, response and recovery during national and regional events. This book concentrates on the four major phases of emergency management - mitigation, preparedness, response, and recovery. Also this book is the first of its kind to take a global approach to the topic of international disaster management and based on the juncture of two separate trends(1) All countries face increased risk from full range of unknown hazards and (2) disaster consequences are having greater adverse effects on population and environments.42

The book “Natural hazard” by Gilbert F. White exists apart from human adjustment to it. It always involves human initiative and choice to natural, local, national, global hazards.43

Disaster Management is relatively a new discipline in India. A few decades ago, the Administration and the government machinery in India had no clear concept of Disaster Management, leave alone its execution and implementation of corrective measures. Ironically, it was the alarm given by natural calamities like cyclones, floods and earthquakes which awakened our authorities and policy planners to concern about the problems and related matters. The book “Disaster Management through the New Millennium” by Ayaz Ahmad is research based and authentic work should fill the bill.44

Disasters are not totally discrete events. The possibility of occurrence, time, place and severity of disaster strike can be reasonably and in some cases accurately predicted by technological and scientific advances. It has been established that a definite pattern in occurrence of such disaster can be reduced to some extent of damage though the extent of damage itself cannot be reduced. The book “Disaster Management” by I. Sundar, T Sezhiyan, 2007 focuses on the basic concept of disaster management and also differentiates disaster from individual, non-extreme or small-scale suffering.45

P. Michael Vetha Siromony’s “Source book on district disaster management” focused on to help the district administration and society to be prepared to face disasters, reduce their vulnerability and prevent loss of lives and property. This source book would help in identifying various resources within the districts and also be identified in handling disasters.46

Harsh K. Gupta’s “Disaster Management” contains seven chapters, each dealing with one major natural disaster encountered in our country. Each of the authors is an expert in that particular field. The outstanding contribution of this book is that it not only deals with the forecasting and description of the various natural disasters, but also stresses the management aspect, exhaustively detailing the necessary steps that need to be taken to deal with the fallout in the wake of these disasters. The book also describes the advances in remote sensing and the state-of-the-art technology available in India for the monitoring and prediction of these phenomena. It also draws up a comprehensive warning system to be implemented, in order to minimize the extensive losses to life and property that occur year after year.47

The book “Disaster Mitigation Experiences and Reflection” by Pardeep Sahni, Alka Dhameja and Uma Medury is a collection articles from several contributors is an excellent analysis of different mitigation strategies. The underlying attempt in each chapter is to illuminate the pertinence of those mitigation efforts that would prepare everyone related with disaster management to comprehend and approach the problem more holistically.48

“Mitigation, Management and Control of Floods in South Asia” Volume I of UN-HABITAT and UNEP chronicles the development and comprises of the complete proceedings of two conferences, of a foundation for collaboration and information exchange for mitigation and flood management in South Asia. The main objective of the meetings was to explore possibilities of technical cooperation among the participating countries on flood management and mitigation.49

The book “Hazards: Assessing Risks and Reducing Disaster” by Keith Smith, David N. Petley provides a balanced overview of all the major rapid-onset events that threaten people and what they value in the twenty-first century.50

48 Pardeep Sahni, Alka Dhameja and Uma Medury, Disaster Mitigation Experiences and Reflection, 2008.
Overall the book “Disaster Management: Warning Response and Community Relocation” by Amit Awasthy expands on the problematic nature of disaster management. It has done so by stressing how the basic conceptual basis of disaster management, preparedness, has little scientific grounding and is plagued by conflicting interpretations, all of which suit organizational demands rather than the potential victims needs. Further it reviews related to hazard vulnerability, disaster event characteristics and pre-impact emergency management interventions as determinants of disaster impacts. It illustrates global patterns in disaster risk and development and introduces the concept of sustainable development as vision for creating disaster-resilient places. Further it outlines a vision for IT-enhanced disaster management in terms of six areas of IT-based capabilities with existing IT use in disaster management and to highlight how to progress would have tangible positive impacts.51

The book, “State, NGOs and Disaster Management” by Kishor Chandra Samal analyses the impact of 1999 Super Cyclone in Orissa, on the livelihood of poor and vulnerable groups and the response of outside agencies including government and NGOs in relief, construction, reconstruction and rehabilitation. It also details strategies adopted by weaker sections, particularly dalits and women, to cope up with the situation. The book concludes that it is not the government alone which can cope up with the catastrophe of such magnitude.52

“Handbook of disaster research” by Havidan Rodriguez, Enrico Louis Quarantelli and Russell Rowe Dynes has brought together a comprehensive, interdisciplinary and international approach to disasters with theoretical, methodological and practical applications. The Handbook is based on the principle that disasters are social constructions and focuses on social science disaster research. In addition, it includes contributions focusing on the relationship between disaster and

development, the popular culture of disasters, new dimensions of disaster research, as well as projections of disasters into future.53

**OBJECTIVES OF THE STUDY**

The following are the objectives:

- To study the meaning and definition of disasters, meaning, scope, and various aspects of disaster management.
- To examine the significance of Disaster Management on international and national perspective.
- To study the Disaster Management in order to assess the role and precautionary measures enforced by the recognized Governmental and Non-Governmental Organizations in India.
- To study the historical account, structure, function and the role of World Vision in Disaster Management.
- To examine the administrative profile of Chennai district, Kancheepuram district, Perambalur district and the district of Thiruvarur in Tamilnadu in order to analyses the role of flood and cyclone disaster management in Chennai, Kancheepuram, Perambalur and Thiruvarur with special reference to World Vision India.
- To provide finding, recommendations and suggestions to promote the significance of policy formulation and implementation for the better disaster management programmes in India.

**HYPOTHESIS OF THE STUDY**

The study attempts to examine the following hypothesis for affirmation or rejection that is “World Vision India as an NGO performs effective organizational Disaster Management to ameliorate and project humanitarian and emergency affairs”.

CHAPTERIZATION

Chapter I: Introduction

This introductory chapter deals with the meaning and definition of disasters, meaning, scope and handling of disaster management, conceptual framework about the research, reason for choosing the topic, aim of the study, objective of the study, hypothesis, research methodology, review of literature and classification of chapters.

Chapter II: Disaster Management –International and National Perspective

This chapter covers elaborately the types of disasters, their effects, the damages caused by them globally, and the organization of emergency management in international perspective, global stimulus - landmark events for Disaster Management, and the role of United Nation in Disaster Management, the role of NGO in Disaster Risk Reduction. Also elucidates the Indian experience of various major disasters.

Chapter III: The Role of Government of India in Disaster Management

This succeeding chapter describes the administrative structure of Government of India in Disaster Management, financial arrangements for Natural Disaster in India, different schemes under Government of India for disaster mitigation and relief, Disaster Management through Panchayat Raj, Non-Governmental Organization in disaster management and application of information technology in Disaster Management particularly in India.

Chapter IV: Organizational Structure and Functions of World Vision India

This chapter focuses on the historical account of World Vision and the structure, function and role of World Vision. A brief note of World Vision India and an overview of humanitarian and emergency affairs in World Vision India and its frameworks are explained in this chapter.

Chapter V: World Vision India in Disaster Management

This chapter enumerates the performance of World Vision India in various disaster management projects. Moreover, the chapter also explains how World Vision
India dealt with the Andhra Pradesh Flood Rehabilitation Project and Bijapur Flood Relief Program. Project design and implementation, Project rationale, justification for the Project and World Vision Response to Flood affected victims are also focused in this chapter. The opinions of the beneficiary of World Vision disaster management programs are dealt with, in detail.

**Chapter VI: The Role of World Vision India in Flood and Cyclone Disaster Management - An Analysis**

This Chapter documents a brief administrative profile of Chennai district, Kancheepuram District, Perambalur District and the district of Thiruvarur in Tamilnadu. This chapter analyses the role of flood and cyclone disaster management in Chennai, Kancheepuram, Perambalur and Thiruvarur with special reference to World Vision India. And also discusses a few case studies and relevant information about the disaster mitigation, preparedness, relief, rehabilitation and reconstruction of Disaster Management in the target areas. The data will be analyzed and interpreted based on the hypothesis of the study.

**Chapter VI: Conclusion**

This chapter enlists the main findings and provides some recommendations and suggestions to promote the significance of policy formulation and implementation for the better disaster management programmes in India.