

Governance and Disaster Management: A Study of Sikkim

A Dissertation Submitted

To

Sikkim University



In Partial Fulfillment of the Requirement for the
Degree of Master of Philosophy

By

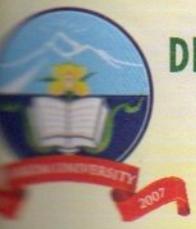
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DEPARTMENT OF PEACE & CONFLICT STUDIES & MANAGEMENT

SCHOOL OF SOCIAL SCIENCES
SIKKIM UNIVERSITY

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DECLARATION

I hereby declare that the dissertation entitled “**Governance and Disaster Management: A Study of Sikkim**” submitted to **Sikkim University** in partial fulfillment of the requirements for the degree of **Master of Philosophy** is my original work. This dissertation has not been submitted for any other degree of this university or any other university.

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“Governance and Disaster Management: A Study of Sikkim”

Submitted by Nor Bahadur Limboo under the supervision of Dr. Salvin Paul of the Department of Peace and Conflict Studies and Management, School of Social Sciences, Sikkim University, Gangtok 737102, India.

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CERTIFICATE

This is to certify that the dissertation entitled “ **Governance and Disaster Management: A Study of Sikkim**” submitted to **Sikkim University** for the award of the degree of **Master of Philosophy** in the Department of Peace and Conflict Studies and Management, embodies the result of bona fide research work carried out by Nor Bahadur Limboo under my guidance and supervision. No part of the dissertation is submitted for any other degrees, diploma, associate-ship and fellowship.

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Contents	Page no
Acknowledgement.....	i
List of Figures.....	ii
List of Tables.....	iii
Abbreviations.....	iv
CHAPTER 1- INTRODUCTION	1 -14
 CHAPTER 2- GOVERNANCE AND DISASTER MANAGEMENT	 15-48
Introduction.....	15
2.1 Governance: Perspectives.....	16-19
2.2 Disaster Management and Governance	19-34
2.3 Global Institutions and Best Practices in Disaster Management	34-50
Conclusion.....	51-52
 CHAPTER 3 -POLICIES AND PROGRAMMES OF DISASTER MANAGEMENT IN INDIA	 53-79
Introduction.....	53
3.1 Disaster in India: An Overview	54- 56
3.2 Legal Initiatives, Programmes and Policies.....	56- 63
3.3 Issues and Concerns in India’s Disaster Management	63– 74
3.4 Disaster Management in Sikkim	74 -78
Conclusion.....	78-79

CHAPTER 4- ISSUES AND CONCERNS OF DISASTER NANGEMENT: A STUDY OF SIKKIM	80 - 110
Introduction.....	80-81
4. 1 Disaster Management in North Sikkim.....	81-89
4.2 Data Interpretation and Analysis.....	90- 81
4.2.1 Socio Economic Status of Respondents	94 - 91
4.2.2 Living Area.....	94- 96
4.2.3 Disaster.....	96 - 98
4.2.4 Pre-Disaster and Post Disaster Plans.....	98-107
4.3 Respondent Views on Disaster Management.....	108
4.4 Government Officials understanding on Disaster.....	108
4.5 NGOs Response on Disaster.....	108
Conclusion.....	109-110
CHAPTER 5- CONCLUSION	111-117
BIBLIOGRAPHY.....	118-127
APPENDIX.....	128-132

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List of Tables

		Page no.
Table No.2.1	People Killed by Disaster in 2005-2014	20-21
Table No 2.2	Types of Natural Disaster	22
Table No 2.3	Types of Man-Made Disaster	23
Table.No.2.4	Types of Technological Disaster	24
Table No 3.1	Damage Caused by Natural Disaster in India 1990-2000	55-56
Table No 3.2	People Killed and Affects by Disaster in 1995-2014	56
Table no 3.3	Region wise Disaster in India	64
Table No 3.4	Earthquake in India	66
Table No 3.5	Impact of Earthquake in Sikkim 2011	76
Table No 4.1	Type of Disaster, Time of Occurrence, Impact and Vulnerable Areas	83
Table No 4.2	Disaster Prone areas of Sikkim	85
Table No 4.3	Areas Wise Classification of Respondents	90
Table No 4.4	Age group of Respondents	92
Table No 4.5	Educational Qualifications of Respondents	92
Table No 4.6	Occupations of Respondents	93
Table No 4.7	Facilities within 5km	95
Table No 4.8	Types of Disaster	96
Table No 4.9	Damage and Destruction Made by Disaster	97
Table No 4.10	Methods of Information on Disaster	99
Table No 4.11	The Agencies in the wake of Disaster	102
Table No 4.12	Relief facilities offered during Disaster	103
Table No 4.13	List of NGOs	109

List of Figures

Figure No 2.1	Governance Structure	26
Figure No 3.1	NDRF Base Camps in India	63
Figure No.4.1	Type of Disaster experienced in North Sikkim	82
Figure No .4.2	Maps of North Sikkim	84
Figure No.4.2	Type of Disaster in North Sikkim	86
Figure No.4.3	Health Institutes in North Sikkim	87
Figure No.4.4	Public Infrastructure in North Sikkim	88
Figure No.4.5	Health Education Institutes in Sikkim	89
Figure No.4.7	Gender of the Respondents	91
Figure No.4.8	Category of house	94
Figure No.4.9	Casualties by Disaster	98
Figure No 4.10	Skill Training and Workshop on Disaster	100
Figure No.4.11	Disaster Management Plan	101
Figure No.4.12	Works and Disaster Management	101
Figure No.4.13	Immediate Relief	104
Figure No.4.14	Supply of Fund During Disaster Management	105
Figure No.4.15	Home Disaster Resistant	106
Figure No 4.16	Improvement in the Basics Facilities, after Post Disaster Management	106

Abbreviations

BSF	Border Security Force
BNPB	Badan Nasional Penanggulangan Bencana
CBRN	Chemical, Biological, Radiological and Nuclear
CERF	Centre Emergency Response Fund
CISF	Central Industrial Security Force
CRED	Centre for Research on the Epidemiology of Disasters
CRED	The Centre for Research on the Epidemiology of Disaster
CRPF	Central Reserve Police Force
DDMAs	District Disaster Management Authorities
DM	Disaster Management
DRMC	The Disaster Risk Management Cycle
EM-DAT	Emergency Event Database
ERFs	Emergency response funds
ESFs	The Emergency Support Functions
FEMA	Federal Emergency Management Agency
FRP	The Federal Response Plan
HPC	The High Powered Committee
ICDS	Integrated Child Development Services
ICRC	The International Committee of The Red Cross
IDNDR	The International Decade for Natural Disaster Reduction
IFRC	The International Federation of Red Cross and Red Crescent Societies
IIPA	The Indian Institute for Public Administration
IMD	The Indian Meteorological Department
IMF	The International Monetary Fund
INGC	Instituto Nacional De Gestão De Calamidades
INGOs	International Non-Government Organizations

ISDR	International Strategy for Disaster Reduction
ITBP	Indo-Tibetan Border Police
NCDM	National Committee of Disaster Management
NDMA	National Disaster Management Authority
NDRF	National Disaster Response Force
NEC	National Executive Committee
NGOs	Non- Governmental Organizations
NIDM	National Institute of Disaster Management
NRA	The Nuclear Regulation Authority
NRF	The National Response Framework
OCHA	Office for the Coordination of Humanitarian Affairs
OFDA	Office of Foreign Disaster Assistance
REDRH	Reconstruction of Earthquake Damaged Rural House
RPB	Rencana Penanggulangan Bencana
SDMAs	State Disaster Management Authorities
SSDMA	Sikkim State Disaster Management Authority
UN	United Nations
UNDP	United Nations Development Programme
UNHCR	The UN High Commissioner for Refugees
UNICEF	The United Nations International Children ‘S Emergency Fund
UNISDR	United Nations Officer for Disaster Risk Reduction
USAID	United State Agency for International Development
WFP	The World Food Programme
WHO	World Health Organization

CHAPTER-1

INTRODUCTION

Sikkim is a mountainous State in the Himalayan region with rich biodiversity and natural resources. It is a land locked State with limited air facility; no rail and water transport facilities. It entirely depends on road transportation. Communication and transportation plays a vital role in the life of people in Sikkim in the wake of disasters.

Sikkim falls under disaster prone area, which has from time to time, taken much of life and property. Sikkim is covered by forest and today people of Sikkim are facing environmental challenges like pollution, climate change, global warming, deforestation and disasters like earthquake, landslide, forest fire, road accident etc. These issues are most important as it is caused by human activities like development, industries, construction of dams, houses and roads etc. Disaster is natural or man-induced processes or events that cause potential loss to human life, property, and disruption to normal activities and essential functions of the community and damage to environment. Landslide and accident are major disaster in Sikkim. Mostly during the rainy season landslide is most often cause of problem in Sikkim and the other is the earthquake which hits time to time.

The rapid developmental process in Sikkim had induced inflow of people, creating very little space for the settlement. So people settle in the areas which are very prone to natural hazards. The most disastrous natural hazard can be traced to the earthquake that hit Sikkim on 18th September 2011. The most affected area during 18th September earthquake was the rural area and most of the rural areas are still underdeveloped in terms of infrastructure. Most of the people living in the rural areas are heavily affected by natural hazards due to poor transportation and infrastructure.

In Sikkim, the Government is the main agents for providing security in the wake of natural calamities. The Land Revenue and Disaster Management Department and Urban Development Housing Department in Sikkim are working for disaster reduction and preparedness to face earthquake and reduce loss of life and property. One of the main

activities to reduce the impact of natural hazards is good Governmental policies and plans for mitigation, remedy, recovery and reconstruction through disaster management. The natural disaster creates direct threat to peace and security of people in Sikkim.

In this back drop, the study will analyze the causes, effects and the consequences of disaster in Sikkim. The study will also analyze the impact of disaster on population and how the capacity of vulnerable communities can be strengthened to cope with disaster. The study will bring out historical events of disaster in Sikkim and highlight knowledge of the people about the issues in tackling the disaster. The most important issues that this study will focus are the Government policies and plans on disaster management and how people have responded to these policies and programmes in wake of disaster in Sikkim.

Rationale and Scope of the Study

Losses of human lives and economic losses from disasters have increased drastically in the last decades. In the month of April and May, 2015, earthquake in Nepal killed over 8000 people and injured more than 21,000. Poorly constructed houses are more vulnerable to disasters. In Sikkim, total population is 607,688 and 600,000, permanent residents population density is 85.6 sq km (Census, 2011). Sikkim is the least populous state in India and the second smallest state after Goa in total area. The state is divided into four districts namely North, South, East and West. There are 440 inhabited villages and there are altogether nine towns, four in East district, two each in South and West districts and one in North district. Sikkim is exposed to a variety of disaster such as earthquake followed by drought, landslide, flood, forest fire, pollution and road accident. Major emergencies in recent years include 18 September 2011 earthquake, with a 5.8 magnitude, in which 60 people lost their life and 34,159 houses were damaged. Any disaster affects people emotionally. The change it brings in life seems unbearable and people often feel helpless, hopeless and frustrated in the aftermath of a disaster. The impact of Disaster is threatening to the life of people- physically, socially, economically and emotionally.

The governance and management planning can serve to establish policies and procedures to protection, conservation and mitigation through the use of community members with the opportunity to learn how to evaluate their situation and the problems, as well as their capabilities to prevent or mitigate adverse impacts of disaster. The government of India, United Nations Development Programme implementing disaster risk reduction programmer in India. The programme is implemented by Ministry of Home Affairs, New Delhi. In Sikkim Land Revenue, Disaster Management Department and Urban Development Housing Department is main body of disaster reduction. In Sikkim the important project and schemes is implemented by Sikkim State Disaster Management Authority fallows as National Earthquake Risk Mitigation Project, this project aim at preparedness of the state to face earthquake and to reduce loss to life and property. National Landslide Mitigation Project aims to strength the structure and non structure landslide mitigation efforts to reduce the landslide and risk and vulnerability in the state which prone to landslides and mudflows and School Safety, this project aims to promote a culture of safety in schools.

The study will examine government policies and programme of Disasters in Sikkim to understand how these policies and programme enable people of Sikkim with preparedness to face during and after disaster with necessary infrastructure, information, knowledge and skills. In this backdrop, the study tries to analyse the governance and Disaster management in Sikkim.

Governance and Disaster Management: Perspectives

Disaster may be defined as an unexpected happening causing a huge loss of life and property. It may be both natural as well as man-made in sense that in some part of the country. Disaster may come in a form of earthquakes, cyclones, floods, drought, fire etc (Bose, 2007). The united nation defines a natural disaster as “the consequences of events triggered by natural hazards that overwhelm local response capacity and seriously affect the social and economic development of a region” (UNDP, 2008). Disaster management is the multi-disciplinary area, it also covers search and rescue, relief, reconstruction and rehabilitation and multi-sectoral, administration, scientists, planner, volunteers and

communities, all have important roles to play, these roles and activities span the pre-disaster, during and post- disaster phase (Singh, 2007).

UNDP definition states that Governance is the exercise of political, economic and administrative authority in the management of a country's affairs at all levels. It comprises mechanisms, processes and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences. Governance encompasses, but also transcends, government. It encompasses all relevant groups, including the private sector and civil society organizations (UNDP, 2010). The structure of governance on disaster currently available institutions, policy administrative and regulatory for mechanism for managing risks (Gall et. al, 2014).

According to Tierney *Disaster Governance* consists of the interrelated sets of norms, organizational and institutional actors, and practices (pre-disaster and post-disaster periods) that are designed to reduce the impacts and losses associated with disasters arising from natural and man- made disaster. Disaster governance goes beyond governmental settings, powers, processes and tools by encouraging collective actions through the engagement of all stakeholders (e.g. governmental, private businesses, non-governmental entities, academia) operating at all scales from local to global (Tierney, 2012).

Disaster Risk Governance involves many actors. Only the State has the capacity to engage legal, administrative and economic reforms to involve all stakeholders in the decision-making process and assign them the powers and means necessary for their missions (Niekerk, 2011). In cases of Bangladesh, some projects seek to promote sustainable development in the face of climate Change, linking disaster risk reduction, climate change adaptation, sustainable livelihoods and good governance likes community mobilization, capacity building, connecting communities to government services, establishing sustainable livelihood practices at community level (tree planting, securing non-saline water supply) and sharing knowledge between all stakeholders and another cases Sendai city, since the 2011 Great East Japan Earthquake and Tsunami, and based on the lessons learnt from it, another development concept was added, disaster resilient

urban infrastructure. Based on the concept of "Building Back Better" and it has been selected as a model eco-town under Sendai City's Earthquake Disaster Reconstruction Plan (Meerpoel, 2015).

According to Viscusi, the government provides more information to people regarding the risks they face. The role of governance is very much important as formulates accurate risk belief concerning the low probability, high loss events associated with disaster (Viscusi, 2006). According to Leva and Apt, the risks from disasters such as floods and hurricanes are more the subject of guesswork. Government information provision could remedy this inadequacy and foster more rational risk taking decisions. Leva and Apt also has recommended emphasis for government policy. In view, there is little that can be done to address large disasters, which tend to be unexpected and infrequent. As a result, the government should focus more on information provision regarding small and moderate natural disasters (Leva and Apt, 2006). Each country bears the primary responsibility for protecting its own people, infrastructure and other national assets from the impact of natural disaster and accepting in the context of increasing global interdependence, concerted international co-operation and an enabling international environment are vital for the success of these national efforts (Yokohama Strategy, 1994).

According to James Lewis, *Intensity and depth or wind strength, rainfall and tide level*, determine the force of natural phenomena, so does the location, status of development, population density and state of preparedness of a human settlement. For instance, the greatest losses of life from natural disaster occur in the less-developed countries and most often amongst the poorest people of those countries (Lewis, 1977). On December 11, 1987, United Nations general assembly adopted resolution 42/169 designating the 1990s the "international decade for natural disaster reduction". State that to reduce through concerted international action, especially in developing countries, loss of life, property damage and social and economic disruption caused by natural disaster. It concluded that these differences are attributable, in large part, to socio-economic factors in particular the stage of development attained by particular societies. It is suggested that

many countries that have undergone rapid development in recent decades are in a state of limbo as far as hazard mitigation is concerned (Degg, 1992).

The last three decades have seen an increase in both the frequency and destructiveness of natural hazards (Guha-Sapir et. al, 2004). From a cumulative US\$75.5 billion in the 1960s, economic losses from natural disasters have skyrocketed in recent decades: they stood at roughly US\$660 billion in the 1990s. As high as this global figure is, it disguises the pertinent fact that developing countries suffer considerably more from natural disasters. Whereas people in developed countries suffer mostly economic damages that are often insured, those in developing countries do suffer proportionally greater losses when measured as a percentage of GDP (World Bank, 2004).

In 2011, drought, and food and political insecurity in East Africa contributed to a full-scale humanitarian crisis. A combination of natural hazards, conflict and fragility provided a recipe for human suffering. From 2005-2009, more than 50 percent of people affected by ‘natural’ disasters lived in fragile and conflict-affected states (Kellett and Sparks, 2012).

The UNDP 2004 reports show high levels of poverty disproportionately increase the vulnerability of those affected by disaster. UNDP defines governance as “the exercise of economic, political, and administrative authority to manage a country’s affairs at all levels. It comprises the mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences. It brings together the actions of state, non-state, and private sector actors”. UNDP explains three kinds of risk governance, economics governance, political governance and administrative governance (UNDP, 2004).

According to Kanti Paul on *Environmental Hazards and Disasters*, a natural disaster, the most important factor that distinguishes a natural event from a disaster. The human components and an event can impact society. An earthquake in an uninhabited desert, even if interesting for the geologist, will have little repercussion on humans. An earthquake in a densely populated area can disrupt not only the local infrastructure and economy, but in our globalized world cause also repercussion on worldwide scale. A

small community with limited resources like Haiti earthquake in 2010, 100,000 to 316,000 deaths, 250,000 residences and 30,000 commercial buildings had damaged will have affected stronger by an event than a large and rich society. It becomes clear from this consideration that to understand environmental hazards and risk, it is necessary to consider not only the physical forces behind a natural event, but also how humans perceive, react to and try to mitigate the effects of such an event (Paul, 2011).

Smith explains in detail the various measures available to reduce the ongoing losses to life and property. He defines basic concepts of hazards, risk, vulnerability and disaster and patterns of disaster impacts and to the optimum management strategies needed to minimize the future impact of damaging events. He argues that individual hazards such as earthquakes, severe storms, floods and droughts, biophysical and technological processes, create distinctive impacts and challenges throughout the world. The ways in which different societies can make positive responses to these threats are placed firmly in the context of sustainable development and environmental changes (Smith, 2012).

Ilan Kelman who contributed to numerous reports and articles on *Disaster Diplomacy*, how disaster affects peace and conflict, argues that disaster diplomacy is identifying whether disaster-related activities provide opportunities to induce cooperation between adversarial countries or communities. These opportunities manifest themselves in the time both before and after a disaster, which means that any goodwill collaboration due to disaster-related activities is understood to be part of disaster (Kelman, 2012).

Ferris argues on *Natural Disaster, Conflict and Human Right: Tracing the Connection*, where natural disasters occur in places where conflict has already disrupted the lives of people and natural disaster is linked to the society's response capacity, state and social structure which are weakened by conflict are less likely to be able to cope with the effects of natural hazards, making it more likely that a natural disaster will result. Somalia's government is extremely weak (controlling only a few blocks of the capital city) as a result of long-standing conflict and thus unable to respond to either the drought or flooding which has occurred in its country. In Somalia, it is more likely that both the state and

community institution would be better able to cope with the natural disaster (Ferris, 2010).

Policies and Programmes of Disaster Management in India

While all these post-Gujarat earthquake reform initiatives were still in their initial phase of implementation a devastating tsunami hit many countries of Indian Ocean and several States of the country further exposing the weakness of the crisis management system of the country. The Disaster Management Bill was introduced in the Parliament in May 2005 and finally enacted in December 2005. The Act defined disaster as ‘an event of natural or man-made causes that leads to sudden disruption of normalcy within society, causing damage to life and property to such an extent that is beyond the capacity of normal social and economic mechanism to cope up with, and to make ‘disaster’ synonymous with practically all ‘crisis’ situations (Ministry of Law and Justices, 2005).

In history of disaster in India ,Bengal famine, Orissa super cyclone, Latur earthquakes, Bhopal chemical disaster, Andhra cyclone, Gujarat earthquake, recurring floods, Mumbai 2008 bomb blasts and many other disaster face in India. Historically India has suffered from droughts and famine. India stands as the one of the most disaster prone countries where numbers of deaths as highest. All government, NGOs and other local organization need to be synchronized to provide suitable relief in acceptable time frame. The effective disaster management plan would be prevention, preparedness, response and recovery (Singh, 2015).

In India there are 29 states and 7 union territories where 22 states are disaster-prone. Disaster in future is going to be the most dangerous threat to the large number of people. Such policies have quite often in the past triggered off several incidents of disaster. Even the developmental policy executions have sometimes resulted in great protests and rebellions by people in several countries. The government of India planned a grand project named as Narmada valley development project to the turn of 3 billion pound investment. However the entire project is hanging in balance. The execution of this project is likely to render at least 100000 people homeless, 2200 families in 61 villages and destroy thousands of acres of cotton, chilli and wheat. In protest of this

project a massive movement has been launched known as Narmada Bachao Andolan. Narmada Bachao Andolan, which has emerged as a people protest against the execution of governmental plans, is a significant example of governance disaster (Ahmad, 2003).

Chawla defines Disasters continue to occur without warning and are perceived to be on an increase in their magnitude, complexity, frequency and economic impact. India due to its geo-climatic and socio-economic condition is prone to various disasters (Chawla, 2012). There was a reported toll of 196 dead persons, 65 missing persons, 3,661 damaged houses and 27,350 hectares of affected crop area. Floods, earthquakes, cyclones, hailstorms, etc. are the most frequently occurring disasters in India (De et. al, 2005). Floods, droughts, cyclones, earthquakes and landslides have been recurrent phenomena. About 60 percent of the landmass is prone to floods, about 8 percent of the total areas are prone to cyclones and 68 percent of the area is susceptible to drought. In the decade 1990- 2000, an average of about 4344 people lost their lives and about 30 million people were affected by disaster every year. The loss in terms of private, community and public assets has been destroyed (Goel, 2010).

National Policy on Disaster Management, highlighted that ‘local authorities like Panchayati Raj Institutions (PRIs) and Municipalities will ensure capacity building of their officers and employees for managing disasters, carry out relief, rehabilitation and reconstruction activities in the affected areas and will prepare Disaster Management Plans. PRIs and Municipalities will play a significant role in the entire process, particularly in response and rescue operations, relief and rehabilitation, awareness generation and disaster preparedness, restoration of livelihood options and co-ordination with NGOs and civil society’ (National Policy on Disaster Management, 2009).

Local Governments in rural as well as urban areas have an important role to play in disaster management, with special reference to disaster preparedness and risk reduction (Gireesan, 2011). Local Government is in a better position to analyse the hazard, risk, vulnerability and capacity effectively, which is imperative in disaster preparedness and risk reduction. During disasters, people look up to the Local Government at the first instance, for addressing their basic needs, concerns and issues. The empowering Local Governments in the process of disaster management, with thrust on disaster preparedness

and risk reduction. Analyzing the efforts made for capacity building of the elected members of PRIs, officials and community members, with special focus on youth, it is noted that lot more is to be done to empower Local Governments to take suitable measures for disaster preparedness and risk reduction (Gireesan, 2013).

Research on disaster in India acknowledges that social systems causes or exacerbate disasters by making people more vulnerable to hazards associated with their daily lives and work environment (Parasuraman and Krishnan, 2013). Environmental issues likes' air pollution, water pollution, garbage and pollution of the natural environment pose major challenges for India. The cause of environmental degradation was mainly due to stresses from development and stresses from lack of development and environment issues such as human population growth, rising energy consumption, global warming and climatic change, deforestation, land degradation (Dwivedi, 2015). Chhattisgarh, Jharkhand and Orissa, show that drought is a major factor in keeping people below the poverty line and monsoon failure is a natural event. But how severe a drought, it will spark off depends on local factors like deforestation and health of soil (Mahapatra, 2013).

Disaster Management in Sikkim: Issues and Concerns

According to Chakraborty and Chakma, Sikkim is one of the most earthquake hazards prone areas. Sikkim is at risk of earthquake hazards and associated vulnerability due to natural as well as human induced activity and lack of awareness among people exaggerates the situation which enhances damage probability. The people and government should have more concern about the construction of building structures (Chakraborty and Chakma, 2013).

Human development Reported in 2012, human security goes much beyond the absence of violent conflict. For most people, a sense of insecurity arises from worries about everyday life. For them security symbolizes protection from the threat of disease, hunger, unemployment, crime, social conflict, political repression and environmental hazards. So Sikkim is rich in biodiversity, huge flora and fauna, abundant water resources and rich in natural resources. Sikkim physiographic structure makes the lives of people

extremely vulnerable to earthquake and landslides. Scarcity of land is likely to assume significant importance in Sikkim and would require serious debate on long term land planning policy with the growing population. With the growing population demand for growth and employment will only increase and land is critical input for sustaining economic development. The growth in urban population is increasing demands for urban civil infrastructure and amenities, putting a strain on local resources. To meet long term challenges of urbanization, Sikkim has to make sensible investment in urban infrastructure and at the same time reduce population pressure on just a few towns (Human Development Report, 2012).

According report on *The Earthquake of 18th September 2011 in Sikkim*, overall condition of the building stock in Sikkim is poor and limitation of land availability, particularly in urban areas, in Gangtok area's drainage system is direct effect. Earthquake induced landslides multiplied the problems of the people engaged in relief and rescue works. Surface connectivity with many far flung areas was cut off due to landslides. Many areas could not even be approached by air due to the bad weather conditions after the earthquake. Communication was worst affected by the earthquake and both road and telecom communication with many far flung areas was snapped. There were many areas that were totally cut off from the State capital and relief supplies and workers could not be sent to these areas. Search and Rescue equipments were not available in adequate quantities with the State. A case of Baystholung village in Dzongu has suffered major damage due to a landslide. Mud slide with a lot of boulders has been responsible for destruction of several houses in Lachung a day after the main earthquake (Disaster Mitigation and Management Center, 2012).

Sikkim State Disaster Management Authority report, *Inventory and GIS mapping of Landslides in North East West and South & it's mitigation* reported that human society and the natural environment have become increasingly vulnerable to nature hazards such as earthquakes, landslides, hurricanes, droughts and floods etc. the situation is particularly not always occurring in Sikkim, but it is situated in the very high zone in regard to earthquake and high zone with regards to landslides, which one of the most disaster prone region of India. Land constitute the major natural which accounts for

considerable loss of life, property and damage to communication networks, human settlement, agricultural and forest land in Sikkim. Management of this type of hazard is confined to post disaster relief and rehabilitation and that too on temporarily basis. According to this report 34,159 house damaged, 1255 government building damaged, 759 school damaged, 377 hospitals damaged, ICDS damaged 875 and water supply schemes damaged 1529 (SSDMA, 2012).

Reconstruction of earthquake damaged rural house project failed 5207 affected families due to improper planning and execution of works resulted in delay in reconstruction houses in rural Sikkim damaged by 18 September 2011 earthquake (Sikkim Express, 31 March 2016).

In Sikkim urban growth is mainly due to migration from other India states, international migration from Nepal, rural to urban migration for better socio-economic opportunities and amenities in urban centers. In the last decade women and children and elder from village moved to towns along with the male workers. People now prefer to have amenities of towns which are an index of growth and transformation. Gangtok being the capital has developed infrastructure and has been able to attract more people. Effect of environment in Sikkim are main cause is migration (Prakash, 2015).

The above literature explains the issues and debates associated with disaster management in the contemporary era at international, national and local level. A disaster is an inevitable phenomenon in the contemporary era but it could be better governed and managed to reduce its impact. The policies and programmes of government of Sikkim will be examined to understand people's response to them to reduce the impact of disaster.

Objectives of the Study

- To analyse the Nature and Scope of Governance and Management in Disaster
- To examine the Policies and Programmes of Disaster Management in India
- To understand people's perception of Disaster Management in Sikkim.

Research Questions

- What is the Scope of Governance and Management in Disaster?
- What are the Policies and Programmes of Disaster Management in India?
- How people perceive about Disaster Management in Sikkim?

Hypothesis

Disaster is an inevitable phenomenon, could it be better governed and managed to reduce its impact.

Research Methodology

Location of the Study: According to the Census of India, 2011 the total population of Sikkim is 607,688 where 323,070 are male and 287,507 are female. Accordingly, the total population of North Sikkim District is 43709, the total population of West Sikkim District is 136435, the total population of South Sikkim District is 146850 and the total population of East Sikkim District is 283583.

The Study Area: The study area is North Sikkim that is divided into five disaster prone places Mangan, Singhik, Mantam, Mangshila and Lanthey Khola of North Sikkim. The first two areas were most affected during the last earthquake and following places are frequently disturbed by landslides in North Sikkim. The study will analyse how people have coped with earthquake, landslide and other disaster over different income levels and occupation.

Methodology: The study is primarily qualitative in nature but quantitative techniques will also be employed to collect primary data from the field. The tools for primary data are government reports, questionnaire and interviews where the sample size is 100. The field work will be conducted in Lanthey Khola and Mantam, Mangan, Mangshila and Singhik of North Sikkim and targeting 25 respondents from each affected areas having different income and occupation. Other stakeholders such as Government Officers, NGOs (particularly working on Disaster related issues), local government, businessman, students and local contractors also will be consulted. The secondary data will be collected from journals, articles, books, newspaper and internet etc.

Chapterization

Chapter I: Introduction

This chapter introduces the issues under examination with the help of review of literature, Rationale and Scope, Objectives of the Study, Research Questions, Hypothesis and Research Methodology and chapterization.

Chapter II: Governance of Disaster Management

This chapter analyses various perspectives on governance and disaster management to understand its role and effectiveness. The first section of this chapter brings various concept and perspectives on governance and disaster management with its role and its necessity in terms of disaster. The second section highlights the types of disaster that directly and indirectly hampering the people in the world. The last section of the chapter deals with international organizations.

Chapter III: Policies and Programmes of Disaster Management in India

This chapter examines different policies and programmes of Disaster Management in India. The first section of this chapter traces out types of disaster prevalent in India. The other section brings out different policies and programmes of disaster management in India and

Chapter IV: Issues and Concern of Disaster Management: A Study of Sikkim

This chapter is based on field visit, data collection, data analyses and interpretation of the data by various forms of figures and tables. The works of Government of Sikkim in terms of disaster management, policies and programmes and public participation are examined to derive findings from the field.

Chapter V: Conclusion

This chapter summarizes whole dissertation with the findings of the study. It will also brings out recommendations and suggestions for further studies which will be helpful in understanding and better governing the impacts of disaster in future.

CHAPTER-2

GOVERNANCE OF DISASTER MANAGEMENT

Introduction

The term disaster may be unexpected happening, causing a huge loss of life and property. Disaster is a major issue in the world; every countries have struggled on major disaster likes floods, earthquake, landslides and drought etc. According to *UNISDR* report on 2015, 346 disaster are reported, 22773 people dead,98.6 million people affected and US\$ 66.5 billion economic lost. In year between 1994 and 2013, recorded 6,873 natural disasters worldwide which claimed 1.35 lives or almost 68,000 lives on average each year and 218 million people were affected by natural disaster on average for every 20 years period.

The disaster cannot be prevented but good governance and disaster management can help to reduce its impact. In present scenario governance is at top row on disaster reduction on national and international level but main issues are population growth, development, and climate change and environment degradation which are major problems faced by world. Another problem is people who are living in those places that are exposed to serious hazards. Yet they still live there because, lack of awareness programmers on disaster in world. At same time most responsibility on governance to improve and innovate to make disaster preparedness, mitigation, response and recovery more affective and accountable. On disaster governance is responsible for it affects in context of governance international organization and NGOs are working on disaster reduction through good policies and plans on disaster, mitigation preparedness, response and recovery.

This chapter tries to examine the scope of government on disaster management and its role towards it. It also highlights the different perspective of governance and its methods towards disaster management with different types of disasters. The global institutions which are working for the disaster prevention and mitigation have also be brought upon.

2.1 GOVERNANCE: PERSPECTIVES

World Bank defines Governance as concerns of the structures, functions, processes, and organizational traditions that have been put in place within the context of a program's authorizing environment "to ensure that the (program) is run in such a way that it achieves its objectives in an effective and transparent manner." It is the "framework of accountability to users, stakeholders and the wider community, within which organizations take decisions, and lead and control their functions, to achieve their objectives."¹

Governance is complicated by the fact that it involves multiple actors, not a single helmsman. These multiple actors are the organization's stakeholders. Decision makers are then accountable to those same stakeholders for the organization's output and the process of producing it (IOG, 2015)².

The same work developed on UNDP defines governance as "the exercise of economic, political, and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences. It brings together the actions of state, non-state, and private sector actors" (UNDP, 2004).

The United Nation Office Disaster Risk Reduction (UNISDR) also analysis "The governance arrangements adopted by many countries, relying heavily on specialized emergency management organizations, are not always appropriate to address disaster risk. The governance approach based on the disaster management cycle and represented by a specialized disaster risk management sector may have reached its limit, while at the same time a new governance paradigm has yet to emerge" (UNISDR, 2015).

¹ The information has been accessed from <http://siteresources.worldbank.org> on 18/06/2016.

² The information has been accessed from http://iog.ca/defining_governance on 18/06/2016.

The terms governance and modes of governance have been broadly used to refer to the steering and coordination of interdependent actors based on institutionalized rule systems (Benz, 2004).

Governance is about effectively implementing socially acceptable allocation and regulation and is thus intensely political. Governance generally involves mediating behavior via values, norms and where possible, through laws. The concept of governance of course encompasses laws, regulations and institutions but it also relates to government policies and action, to domestic activities and to networks of influence, including international market forces, the private sector and civil society. Good governance matters a great deal for economic, social and environmental outcomes. Some necessary conditions for good governance are inclusiveness, accountability, participation, transparency, predictability and responsiveness (Rogers and Hall, 2003).

The concept of governance may be applied to any form of collective action. Governance is about the more strategic aspects of steering: the larger decisions about both direction and roles. That is, governance is not only about where to go, but also about who should be involved in deciding, and in what capacity. There are three areas or zones where the concept is particularly relevant.

Governance in global space or global governance, deals with issues outside the direct preview of individual. Governance in national level within a country, which there may be several levels national, provincial or state, aboriginal, urban or local. However, particularly at the community level, governance is concerned with how other actors, such as civil society organization, may play a role in taking decisions on matters of public concern. Aboriginal governance is an area of particular complexity because the challenge is to create space for new kind of the government within fields of jurisdiction already occupied by national or provincial government structures. Corporate governance comprises the activities of incorporated and non incorporated organizations that are usually accountable to a broad of directions. Some such organization will be privately owned and operated, e.g. business corporations. Other may be publicly owned, e.g. hospital, schools, government corporation etc governance issues here tend to be

concerned with the role of the board of direction, its relationship to top management and accountability to shareholders or stakeholders (Dayton, 2001).

Roseneau and Czempiel 1992 their work, *Governance without Government: Order and Change in World Politics*. These ideas were closely followed by the work of Kooiman (1993). Rhodes explaining governance as the emerging pattern (or order) of a system that is both the outcomes of social processes (interaction) as well as the medium through which actor can act and interpret this pattern. Governance is characterized by a redistribution of state power and a change in way society is governed (Rhodes, 1996).

Governance refers to a complex set of institution and actors that are drawn from but also beyond government. Governance recognizes the blurring of boundaries and responsibilities for tackling social and economic issues. Governance identifies the power dependence involved in the relationship between institutions involved in collective action. Governance is about autonomous self governing networks of actors. Governance recognizes the capacity to get things done which does not rest on the power of government to command or use authority. It sees government as able to use new tools and techniques to steer and guide (UNDP, 2004).

Governance refers to “the capacity to govern a public problem. This capacity to govern manifests itself in the continuous and stable management not only by successive governments and administrations in a country but also by the stakeholders in the public and private (Ballart, 2013).

The term governance is mostly used to indicate a new mode of governing, different from the old hierarchical model in which state authorities exert sovereign control over the people and groups making up civil society (Mayntz, 1998). ‘Governance’ refers to a basically non hierarchical mode of governing, where non-state, private corporate actors (formal organizations) participate in the formulation and implementation of public policy (Rhodes, 1997).

Renate Mayntz argues that governance theory began by “being concerned with the steering actions of political authorities as they deliberately attempt to shape socio-economic structures and processes.” However, recently, “governance” has been used in

ways that differ from political steering. Firstly, it is used as an alternative mode of governing that is distinct from the hierarchical control model, namely, “a more cooperative mode where state and non-state actors participate in mixed public/private networks.” Secondly, it is used to mean different models of coordinating individual actions or basic forms of social order. Mayntz further claims that modern governance after World War II arose from the growing aspiration of governments to steer their nations towards better defined goals of social and economic development. As Mayntz further noted, “the first paradigm of governance concept was thus concerned with policy development and policy implementation and it adopted a top-down or legislators’ perspective” (Mayntz, 2003).

According to Goodwin adopting a governance perspective entails giving attention to the distribution of political power both internal and external to state. The distribution of power between state and non state actors has changed significantly over the last twenty years, as a consequence of neoliberal economic and political restructuring. This is often referred to as the shift from government to governance.

2.2 DISASTER MANAGEMENT AND GOVERNANCE

Disaster management and governance are different concepts but on disaster both concepts interlink with each other, in basically governance is governing and action plans and disaster management is governing body and implements plans and policy.

Disasters

The *Oxford English dictionary* states that the word disaster derives from the 16th century French word ‘disaster’. ‘Desastre’ is a combination of two terms. ‘Des’ and ‘Aster’. Des means bad star or evil and aster means star. Disaster therefore implies loss or damage occurring due to some unfavorable star. In modern world term disaster means or denotes any odd event, whether natural or man-made, which can bring about sudden and great miseries to humanity in terms of loss of life or property³.

³ The information has been accessed from <https://en.oxforddictionaries.com> on 18/08/2016.

The United Nation defines disaster as “the occurrence of a sudden or major misfortune which disrupts the basis fabric and normal functioning of society or community” (UNDP, 2015). Disaster is a sudden, calamitous event that causes serious disruption of the functioning of a community or a society causing widespread human, material, economic and environment losses which exceed the ability of the affected community or society to cope using its own level of resources.

Types of Disaster

Disasters are normally divided into two broad categories i.e. natural and manmade (technological) disasters. A disaster is a result from the combination of hazards, vulnerability and risk.

Table No .2.1
People Killed by Disaster in 2005-2014

Disaster	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total
Drought	88	208	n.a.	6	2	10,00	n.a.	n.a	n.a.	n.a	20,304
Dry mass movements	n.d.r	11	n.d.r	120	36	n.d.r	n.d.r	16	46	n.d.r	229
Earthquake	76,241	6,692	780	87,918	1,888	226,735	20,946	711	1,120	772	423,803
Extreme Temperature	814	5,104	1,044	1,608	1,212	57,064	806	1,598	1,982	1,189	72,421
Floods	5,754	5,845	8,565	4,028	3,581	8,579	6,148	3,574	9,819	3,199	59,092
Insect Infestation	n.d.r	n.a	n.d.r	n.d.r	n.a	n.a	n.a	n.d.r	n.d.r	n.d,r	n.a
Landslide	646	1,638	271	504	642	3,424	309	504	235	1,303	9,476
Storms	5,294	4,329	6,035	140,985	3,287	1,564	3,103	3,102	8,603	1,383	177,685
Volcanic	3	5	11	16	n.a	323	3	n.a	n.a	101	462
Wildfires	43	16	148	86	190	166	10	22	35	16	732
Total Natural Disaster	88,883	23,848	16,854	235,271	10,838	307,855	41,325	9,527	21,840	7,963	764,204

Industries	2,281	1,857	1,669	776	934	1,061	727	787	1,907	878	12,877
Miscellaneous	2,669	1,126	909	895	911	1,507	755	1,112	1,003	646	11,533
Transport Accidents	6,702	7,021	5,275	5,275	5,021	4,177	5,144	4,152	3,801	4,360	50,728
Total Technological Disaster	11,652	10,004	7,653	6,946	6,866	6,745	6,626	6,051	6,711	5,884	75,138
Total	100,535	33,852	24,507	242,217	17,704	314,600	47,951	15,578	28,551	13,847	839,342

Source: Centre for Research on the Epidemiology of Disaster, Annual Disaster Statistical Review, 2015.

In 2014 the number of death caused by natural disaster was very small; it was the lowest of decades, amounting to one tenth of the average for the decade. Death from technological disaster was also at their lowest level. Among natural disaster, the number of death from floods and storms was the lowest of the decade far below their average. Death from earthquakes was at their second lowest of decade very far below average and death from wildfires third lowest. Inversely, death from volcanic activities was at their second highest level for the decade and from landslides at their third highest.

The two deadliest natural disasters in 2014 was an earthquake in China 731 deaths and a cold wave in Peru 505 deaths. These number cannot be compared to those reported from Haiti earthquake in 2010 222,570 deaths, cyclone Nargis in Myanmar in 2008 138,375 deaths, the Sichuan earthquake in China in 2008 87,476 deaths, the 2005 Kashmir earthquake 74648 deaths and a heat wave in Russia in 2010 55,736 deaths. Among technological disaster, the number of death form miscellaneous accident was the third lowest of the decade, while death from transport accident was at their third lowest and those from industries accident at their fourth lowest. The two deathliest technological disasters were the Sewol shipwreck in the republic of Korea with 304 deaths and an explosion in the soma mine in Turkey 301 deaths.

Natural Disaster

Natural disasters occur as the result of action of the natural forces and tend to be accepted as unfortunate, but inevitable. The natural disaster results from forces of climate change and geology. Natural disaster is perhaps the most unexpected and costly in term of loss of human lives and resources.

The natural disaster such as earthquake, flood, hurricane, cyclone or typhoon, tornado, fir, tsunami, avalanche, volcanic eruption, drought and landslide occurs suddenly with far-reaching, severe physical, ecological and socio-economic consequences. They can also occur slowly, like drought and desertification which are caused by natural phenomena, or by natural phenomena coupled with overt effects of human action (Santra, 2001:555-570). Natural disasters are generally classified as having hydrological, meteorological, climatic, geophysical or biological cause/origins (Guha-sapir et. al, 2012).

The natural disaster can be divided into three subgroup hydro-meteorological disaster, geophysical disaster and biological disaster.

Table No 2.2

Types of Natural Disasters

Natural Disaster	Types
Hydro-Meteorological Disaster	Floods, Storms and Drought
Geo-Physical Disaster	Earthquakes tsunamis, Volcanic Eruptions and Landslide
Biological Disaster	Epidemics and Insect Infestation

Source: Centre for Research on the Epidemiology of Disaster, Emergency Events Database, EMDAT, 2010.

Man- Made Disaster and Technological Disaster

In Man-made disaster, human action results in the disruption of living condition with a considerable number of death and casualties. War and social disorders is also one of the components of man-made disaster that causes hindrance to the people and society.

Man-made disasters are sometimes predictable and preventable. Industrial accidents or accidents in the transportation of dangerous materials or chemicals cause a disaster. Man-made disaster can develop suddenly or slowly they may have a technological or ecological origin. The effects of this disaster have short and the long consequences (Lechat, 1994). The manmade disaster can be divided into two subgroup i.e. economic crises and violence.

Table No 2.3
Types of Man-Made Disaster

Man-Made Disaster	Type of Man -Made Disaster
Economic Crises	Currency crises, Financial and Hyperinflation,
Violence	Terrorism, Civil Strifes, Riots and Wars

Source: Centre for Research on the Epidemiology of Disaster, Emergency Events Database, EMDAT, 2010.

Man-made disaster and technological disaster are similar in their effects and causes; the technological disaster can be dived into two subgroup industrial accidents and transport accidents.

Table No 2.4
Types of Technological Disaster

Technological Disaster	Type of Technological Disaster
Industrial Accidents	Chemical spills, collapses of Industrial Infrastructures Fires, and Radiation
Transport Accidents	Air, Rail, Road or Water

Source: Centre for Research on the Epidemiology of Disaster, Emergency Events Database, EMDAT, 2010.

The man-made disaster around the world had affected human as well as the environment directly and indirectly. The fire at coconut grove, in Boston in 1942, in which 450 died, some of the most devastating man-made disaster in history include the bombing of Chinese capital of Chongqing during World War II, which left over 2,500 people dead. London ‘killer fog or the great smog that occurred in 1952 left nearly 12,000 people dead. The Bhopal Gas Tragedy, India faced a disastrous gas leak, which resulted in nearly

30,000 deaths⁴. These are the some of the most dangerous man- made disaster that shook the world and also showed how man can become the perpetrators of disasters.

Governance on Disaster

The disaster governance's new concept is closely related to risk governance and environmental governance. Disaster governance arrangements and challenges are shaped by forces such as globalization, world-system dynamics, and social inequality and socio-demography trends. Governance regimes are polycentric and multi scale, show variation across the hazards cycle and tend to lack integration and to be formulated in response to particular large scale disaster events. Disaster governance is nested within and influenced by overarching societal governance systems. Although governance systems, as the governmental response to hurricane Katrina shows, poorly governed societies and weak states are almost certain to exhibit deficiencies in disaster governance. State civil society relationship, economic organization, and societal transition have implications for disaster governance (Tierney, 2012).

Disaster risk management reflect the principal of good governance ,institutional and legislative systems for disaster risk management explains “good governance” in disaster risk management facilitates transparency and accountability and thus reduces opportunities for corruption at the government and as well as civil society level, National policies provide firm commitments of the state to address development priorities at hand and give a clear mandate to decision-makers, planners, practitioners as well as the civil society. Good governance will provide an enabling environment for disaster risk management, which will translate into political commitment of decision-makers. Risk management principles, good practices and tools will bring about the desired change at all levels of intervention and reduce vulnerabilities in the long term. These include risk and impact assessments, early warning systems, public awareness, education and training, information management and research as much as environmental and natural resource management, social and economic development practices, physical and technical measures and lastly preparedness and emergency management (UNDP, 2007)

⁴ The information has been accessed from <http://listverse.com/2012/02/05/10> on 21/06/2016.

Governance is an important determining factor of the possible success of DRM and is considered key for achieving sustainable human development. It is defined as “the system of values, policies, and institutions by which a society manages its economic, political, and social affairs through interactions within and among the state, civil society and private sectors. It is the way a society organizes itself to make and implement decisions – achieving mutual understanding, agreement and action. It comprises the mechanisms and processes for citizens and groups articulate their interest, mediate their differences and exercise their legal rights and obligations. It is the rules, institutions and practices that set limits and provide incentives for individual organizations and firms. Governance, including its social, political and economic dimensions, operates at every level of human enterprise, be it the household, village, municipality, nation, region or globe” (UNDP, 2008).

In its governance policy UNDP emphasizes the need for a holistic approach in capacity building for governance recognizing the links which exist between institutions, levels and systems. In countries that are not experiencing serious political, economic or social crises four focus areas have been identified to facilitate UNDP’s provision of comprehensive programme assistance to governance efforts.

Figure No.2.1

Governance Structure



Source: UNDP, Global review: UNDP support to institutional and legislative systems for Disaster Risk Management, 2007.

Governing intuitions are key political institutions of the state, including legislatures, legal and judicial systems and electoral and human rights bodies. Public and private sector management is key institutions in charge of the management of economic transactions and social resources. Decentralization is key to the distribution of the financial and administrative processes of decision-making and management of public programmes among central, regional and local levels and civil society organizations is key role in various groups and individuals which can actively contribute to the public policy-making process and participate in the political, economic, and social affairs of the state (UNDP, 2007).

Disaster Management

World Bank defines Management as a concern of the day-to-day operation of the program within the context of the strategies, policies, processes, and procedures that have been established by the governing body”⁵.

Disaster management can be defined as the body of policy and administrative decisions and operational activities that pertain to the various stages of a disaster at all levels. Disaster management comprises of two components, viz. Disaster preparedness and disaster relief. Both the components have their own importance. In the aftermath of disaster, relief and rehabilitation need immediate attention and early response. A relatively smaller investment in disaster preparedness can save thousands of lives and vital economic assets, as well as reduce the cost of overall relief assistance. The disaster preparedness is a very cost effective component of disaster management (Sinha, 1998, Carter, 1991).

According to Warfield (2008) Disaster management aims to reduce, or avoid the potential losses from hazards, assure prompt and appropriate assistance to victims of disaster, and achieve rapid and effective recovery. The disaster management cycle illustrates the ongoing process by which governments, businesses, and civil society plan for and reduce the impact of disasters, react during and immediately following a disaster, and take steps to recover after a disaster has occurred. Appropriate actions at all points in

⁵ Information has been accessed from <http://siteresources.worldbank.org> on 29/06/2016.

the cycle lead to greater preparedness, better warnings, reduced vulnerability or the prevention of disasters during the next iteration of the cycle. The complete disaster management cycle includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property, and infrastructure (Warfield, 2008).

According to P. Namboodripad (2008) disaster management is defined as continuous and integrated process of planning, organizing, coordinating and implementing measures which are necessary or expedient to prevent danger or threat of any disaster, mitigation or reduce the risk or severity or consequences of any disaster, capacity building and preparedness to deal with any disaster, prompt response to any threatening disaster situation or disaster assessing the severity or magnitude of effects of any disaster evacuation, rescue and relief, rehabilitation and reconstruction.

Disaster management is a broad and interdisciplinary in nature and implementation oriented. In disaster management this terminology is used by Shaw and Krishnamurthy (2012) explains disaster management and its components, also describes disaster management as an umbrella concept.

Disaster Management Cycle

The Disaster risk management cycle diagram (DRMC) highlights the range of initiatives which normally occur during both the Emergency response and Recovery stages of a disaster. Some of these cut across both stages (such things as coordination and the provision of ongoing assistance); whilst other activities are unique to each stage (e.g. Early Warning and Evacuation during Emergency Response; and Reconstruction and Economic and Social Recovery as part of Recovery). The DRMC also highlights the role of the media, where there is a strong relationship between this and funding opportunities. This diagram works best for relatively sudden-onset disasters, such as floods, earthquakes, bushfires, tsunamis, cyclones etc, but is less reflective of slow-onset disasters, such as drought, where there is no obviously recognizable single event which triggers the movement into the Emergency Response stage (Khan, 2008).

The mitigation and preparedness phases occur as disaster management where improvements are made in anticipation of a disaster event. As disaster occurs, disaster management actors, in particular humanitarian organizations become involved in the immediate response and long term recovery phases.

There are three key stages of activities in disaster management

Before a disaster (pre disaster): to develop the capacity and create resilience in the community and responders to minimize human, material or environmental losses caused by hazards. During disaster to ensure that the needs and provisions of victims are met to alleviate their sufferings, the aim should be to build back better (Khanna, 2011:3).

Disaster Mitigation

Mitigation means action taken to prevent or reduce the risk to life, property, social and economic activities, and natural resources from natural hazards is central to the decade initiative. Awareness education, preparedness, and prediction and warning systems can reduce the disruptive impacts of a natural disaster on communities.

According to Olshansky and Kartez, the concept of on mitigation actions includes structural and non structural action undertaken to limit the adverse impacts of a hazard event. Some of the tools that are employed for hazards mitigation are building standards, development regulation, critical and public facilities policies, land and property acquisition, taxation and fiscal policies and information dissemination (Olshansky and Kartez, 1998: 170-71).

Mitigation activities actually eliminate or reduce or the probability of disaster occurrence, or reduce the effects of unavoidable disasters. Mitigation measures include building codes, vulnerability analyses updates, zoning and land use management, building use regulations and safety codes, preventive health care and public education. The mitigation phase and indeed the whole disaster management cycle, includes the shaping of public policies and plans that either modify the causes of disasters or mitigate their effects on people, property and infrastructure (Warfield, 2008).

One of the best known examples of investment in disaster mitigation is the red river floodway. The building of the floodway was a joint provincial and government undertaking to protect the city of Winnipeg and reduce the impact of flooding in the red river basin. Since then, the floodway has been used over 20 times. Its use during the 1997 red river flood alone saved an estimated \$6 billion. The floodway was expanded in 2006 as a joint provincial and government initiative. Disaster mitigation measures may be structural or non structural. Mitigation activities should incorporate the measurement and assessment of the evolving risk environment. Activities may include the creation of comprehensive, pro-active tools that help decide where to focus funding and efforts in risk reduction (Khanna and Nina, 2011).

Disaster Preparedness

The goals of disaster preparedness are to know what to do in disaster aftermath, knowing how to do it and being prepared with the right tools to do it effectively and preparedness which minimizes hazards. According to Coppola preparedness action and activities divided into two part government preparedness which included planning, exercise training equipment statutory authority and public preparedness included public education through awareness behavior and warning (Coppola, 2007).

Preparedness emergency or disaster preparedness involves actions that are carried out before disasters in order to facilitate social groups to respond when disaster occurs. Preparedness include activities such as formulating and testing disaster emergency plans, providing training in order to increase awareness, and communicating with the general public to teach what to do in case of a disaster. Preparedness activities take place at various levels, from household and communities to emergency management and other crisis relevant organization in state and national level (Gencer, 2007: 38).

FEMA defines preparedness as: “the leadership, training, readiness and exercise support, and technical and financial assistance to strengthen citizens, communities, state, local, and tribal governments, and professional emergency workers as they prepare for

disasters, mitigate the effects of disasters, respond to community needs after a disaster, and launch effective recovery efforts”⁶.

According to Jeannette Sutton and Kathleen Tierney explains about basic concept of disaster preparedness encompasses measures aimed at enhancing life safety when a disaster occurs, such as protective action during an earthquake, hazardous materials spill, or terrorist attack. It also includes action designed to enhance the ability to undertake emergency action in order to protect property and contain disaster damage and disruption as well as the ability to engage in post- disaster restoration and early recovery activities (Sutton & Tierney, 2006).

Disaster Response

The response phase of disaster management deals with search and rescue but in case the focus will quickly turn to the basic needs of the affected population. The affected population basic needs are shelter, foods and medical.

Response is defined as the actions taken to save lives and prevent further damage in a disaster or emergency situation. Response is putting preparedness plans into action. Response activities may include damage assessment, search and rescue, fire fighting, and sheltering victims. Response activities take place during an emergency (Gustin, 2010).

The response function of emergency management includes action aimed at limiting injuries, loss of life, and damage to property and the environment that are taken prior to, during and immediately after hazards events. Response processes begin as soon as it becomes apparent that a hazards event is imminent and lasts until the emergency is declared to be over. Response includes not only those activities that directly address these immediate needs such as first aid, search and rescue, and shelter but also includes system developed to coordinate and support such efforts. Response involves the rapid resumption of critical infrastructure such as opening transportation routes, restoring communication and electricity. And ensuring food and clean water distribution to allow recovery to take

⁶ The information has been accessed from <http://www.search.ask.com/web> on 29/11/2016.

place, reduce further injury and loss of life, and speed the return to a normally functioning society. Disaster response is centered upon information and coordination (Coppola, 2006: 251-252).

Emergency response consists of action taken during, after and in the case of some hazards, a short time before disaster impacts, in order to reduce casualties and damage. These actions include disseminating warnings, searching for and rescuing disaster victims, fire fighting, damage assessment, as well as providing emergency sheltering and medical care (Gencer, 2007:38-39).

The aim of emergency response is to provide immediate assistance to maintain life, improve health and support the morale of the affected population. Such assistance may range from providing specific but limited aid, such as assisting refugees with transport, temporary shelter, and food, to establishing semi-permanent settlement in camps and other locations. It also may involve initial repairs to damaged infrastructure. The focus in the response phase is on meeting the basic needs of the people until more permanent and sustainable solutions can be found. Humanitarian organizations are often strongly present in this phase of the disaster management cycle (Warfield, 2008).

The earthquake hit Haiti in 2010 approximately three million people and claimed nearly a quarter of a million lives, another 300,000 were injured and 1.5 million were left homeless. local world vision into action, during the emergency relief phase of the response, world vision distributed food to 2.5 million people in the first four month provide emergency shelter for 40,000 displaced families and worked to ensure access to safety drinking water and sanitation in displacement camps through surrounding areas (Irwin and Horugavye, 2012).

Disaster Recovery

Disaster recovery is the emergency management function by which countries, communities, families, and individuals repair, reconstruct, or regain what has been lost as result of disaster and ideally, reduce the risk of similar catastrophe in future. The disasters associated with disaster recovery are the most diverse of all the disaster management functions. The range of individuals, organization and groups that are involved is also

greater than in any other function. It is complex process, closely intertwined with the other three phases of emergency management and requires great amounts of planning, coordination and funding. Action and activities commonly performed in the recovery period of disaster include.

- Ongoing communication with the public
- Provision of temporary housing or long-term shelter
- Assessment of damages and needs
- Demolition of damaged structures
- Clearance, removal, and disposal of debris
- Rehabilitation of infrastructure
- Inspection of damaged structure
- Repair of damaged structures
- New construction
- Social rehabilitation programs
- Creation of employment opportunities
- Reimbursement for property losses
- Rehabilitation of the injured reassessment of hazards

Disaster recovery is almost always a long and arduous process that is more often measured in decades than month and years (Coppola, 2006:299-300).

Post-disaster recovery includes action in order to repair, rebuild, and reconstruct damaged properties, and to restore disrupted community and economic activities. These actions mostly focus on the provision of temporary shelters and reconstruction of new housing, as well as public infrastructure and facilities and delivering moral and financial assistance to the ones that have suffered from a disaster (Tierney, Lindell, and Perry, 2005). When post-disaster recovery is viewed as more than a physical reconstruction process, but as a social process that attempts to learn and apply lessons from previous disasters through a pre-disaster planning, this understanding brings it back to the start of the disaster management cycle, hazards mitigation (Gencer, 2007: 39).

The emergency is brought under control as the affected population is capable of undertaking a growing number of activities aimed at restoring their lives and the infrastructure that supports them. There is no distinct point at which immediate relief changes into recovery and then into long-term sustainable development. There will be many opportunities during the recovery period to enhance prevention and increase preparedness, thus reducing vulnerability. Ideally, there should be a smooth transition from recovery to on-going development. Recovery activities continue until all systems return to normal or better. Recovery measures, both short and long term, include returning vital life-support systems to minimum operating standards; temporary housing; public information; health and safety education; reconstruction; counseling programs; and economic impact studies. Information resources and services include data collection related to rebuilding, and documentation of lessons learned (Warfield, 2008, Gustin, 2010).

2.3 GLOBAL INSTITUTIONS AND BEST PRACTICE IN DISASTER MANAGEMENT

2.3.1 International Organization on Disaster Management

Disaster management is complex process involving international, national and local organization each with distinct role to play. To respond to disaster risk reduction, international organization is important role to play disaster reduction, according to disaster management cycle, international organization plays important role in four phase i.e. mitigation, preparedness, recovery and response.

The natural disasters are global phenomenon and strike regardless of any national boundaries or socio-economic status of the region. This has led to a strong international fraternity defined at the highest level by several UN bodies. The United Nations declared the decade from 1990 till 2000 as the international decade for natural disaster reduction. The major conference of the IDNDR programme was held in Yokohama in May 1994, where plan of action for disaster reduction called the Yokohama strategy was evolved (Ahmad, 2003).

The following international organization are support and working on disaster reduction plans.

- The United Nation and its Organization
- Health Care in danger project
- The International Federation of Red Cross and Red Crescent societies
- The International Committee of the Red Cross
- International Non- Governmental Agencies
- National Organization

The United Nations system

The UN was recognized in 1945, when representatives from 51 countries met in San Francisco to create the United Nations charter as a commitment to preserve peace in aftermath of world war. Soon after that year, the charter was ratified by the five permanent members of the China, France, the Soviet Union, the United Kingdom, and the United States. Today 192 countries are members of the UN and charter. The major UN bodies and their associated programs, the UN has established a presence in most countries throughout the world and fostered partnership with member state governments. Although more than 70 percent of UN works is devoted to development activities, several other issues are central in their mission, including disaster mitigation, preparedness, response and recovery. In the event of a disaster the UN is quite possibly the best equipped to coordinate disaster relief and to work with the governments to rehabilitate and reconstruct (Bennett and Oliver, 2002).

Upon onset of disaster, the UN responds immediately and on ongoing basis by supplying aid in the form of food, shelter, medical assistance, and logistical support. The UN emergency relief coordinator heads the international UN Response to crises through a committee of several humanitarian bodies, including the UN Children's Fund (UNICEF), The United Nation Development Programmed(UNDP), the world food programme (WFP), The UN High Commissioner For Refugees(UNHCR) and other associates as deemed necessary in accordance with the problems specific to events. Each of these agencies, as shown in this section, fulfills a specific need presented by most humanitarian

emergencies be they natural and man-made. The UN adopted its International Strategy for Disaster Reduction (ISDR) to promote the necessity of disaster reduction and risk mitigation as part of its mission (Haddow, Bullock and Coppola, 2011).

United Nations Development Programme

The United Nations Development Programme was established in 1965 during the decade of development to conducted investigation into private investment in developing countries. The UNDP was not originally considered an agency on the forefront of International Disaster Management and Humanitarian Emergencies because while it addressed national capacities. The UNDP now recognizes that disaster management must be viewed as integral to their mission in the developing world, as well as to civil conflict and complex humanitarian emergency scenarios. The UNDP links disaster vulnerability to a lack of or weak infrastructure, poor environmental policy, land misuse and growing population in disaster prone areas when disaster occur a country national development `which UNDP serves to promote, can be set back years, if not decades. In 1997 under the UN programme for reform, mitigation and preparedness response and emergency relief coordinator were formally transferred to UNDP. In response the UNDP created the disaster reduction and recovery programme and this program was proven effective in many recovery operation, including Cambodia after three decades of civil war, Afghanistan after the 2001 conflict, Gujarat India after the 2001 earthquake and from 2008 to 2010 in Sri lanka after the 26 years of civil war this special activities of the UNDP recovery mission (Haddow, Bullock and Coppola, 2011, Hurd, 2011, Barkin, 2006).

The United Nation Office for the Coordination of Humanitarian Affairs

The United Nation Office for the Coordination of Humanitarian Affairs established in 1991, the headquarters in New York main office in Geneva and 30 regional and field's offices. The mission of the Office for the Coordination of Humanitarian Affairs (OCHA) is to mobilize and coordinate effective and principled humanitarian action in partnership with national and international actors in order to: alleviate human suffering in disasters and emergencies advocate for the rights of people in need promote preparedness and prevention facilitate sustainable solutions. OCHA aims to speak out on behalf of people

affected by humanitarian crises. Specific areas of focus include the protection of civilians, displacement, disaster preparedness and the efficiency of humanitarian response. Current advocacy priorities in 2009 at the global level are focused on Internal Displacement, Climate Change, and Gender-Based Violence (Haddow, Bullock and Coppola, 2011).

OCHA supports and facilitates the work of UN agencies, non-governmental organizations and the Red Cross/Crescent Movement in delivering humanitarian services. Working closely with governments to support them in their lead role in humanitarian response, OCHA takes a multi-faceted approach. According to a report of OCHA on 2015, it coordinates efforts to plan humanitarian action, obtain funding and monitor progress in the aftermath of sudden disasters and during protracted crises. Funding requests are based on a thorough needs evaluation. They are underpinned by strategic response plans that lay out the common humanitarian response and make a compelling, evidence-based case for assistance. This collaborative process enables humanitarian actors to coordinate, carry out and monitor their responses and to appeal for funds as a group. This makes aid more effective, efficient and predictable. OCHA manages three types of pooled funds: CERF, Common Humanitarian Funds (CHF) and Emergency Response Funds (ERF). They all provide rapid funding for life-saving activities (Global Humanitarian Overview, 2016).

The United Nations Children's Fund

The United Nations Children's Fund (UNICEF, formerly known as the United Nations International Children's Emergency Fund) was established in the aftermath of world war II. Its original mandate was to aid the children suffering in postwar Europe, but its mission has been expanded to address the problems that affected poor children throughout the world. UNICEF is mandated by the general assembly to serve as an advocate for children's rights, to ensure that each child receives at least the minimum requirements for survival and to increase opportunities for a successful future. In situations of disaster or armed conflict where this is the case, UNICEF is well positioned to serve an immediate role as aid provider to its specific target groups. This rapid response is important because young mothers and children are often the most marginalized groups

in terms of aid receive. UNICEF works on a regular basis to ensure that children have access to education, healthcare, safety and protected child rights. In the response and recovery period of humanitarian emergencies, these roles are merely expanded to suit the rapidly expanded requirement of victims. UNICEF maintains that humanitarian assistance should include programs aimed specifically for child victims. Relief projects generally work to provide a rapidly needed response in the form of immunization, water and sanitation, nutrition, education and health. UNICEF is currently active in more than 190 countries (Haddow, Bullock and Coppola, 2011).

The World Food Programme

The World Food Programme (WFP) is the arm of the UN tasked with reacting to hunger related emergencies throughout the developing world. The WFP was created late in 1961 by a resolution adopted by the UN general assembly and the UN Food and Agriculture Organization (FAO). In the aftermath of disaster during the reconstruction phase, it is often necessary for the WFP to remain an active player through continued food distribution. Rehabilitation projects are implemented in a way that fosters increased local development and include providing food aid to families and food for working programs which break the chains of reliance on aid as well as provide an incentive to rebuild communities (Haddow, Bullock and Coppola, 2011, :280-281).

The World Health Organization

The World Health Organization (WHO) was proposed during the original meeting to establish the UN system in San Francisco in 1945. In 1946 at the united health conference in New York, the WHO constitution was approved. It was signed and made official, like the WFP, WHO proved its value by responding to an emergency (a cholera epidemic in Egypt) months before it was an officially recognized organization. WHO was established to serve as the central authority on sanitation and health issues throughout the globe. In the event of disaster, WHO respond in several ways that address the health of victims. Most important, it provides ongoing monitoring of diseases traditionally observed within the unsanitary condition of disaster aftermath. WHO also provides technical assistance to the responding agencies and host government that are establishing

disaster medical capabilities and serve as a constant source of expertise as needs arise (Haddow, Bullock and Coppola, 2011:281).

2.3.2 Nongovernment Organizations

The number of the nongovernment organizations (NGOs) focusing on international humanitarian relief has grown exponentially in past few decades. These organizations have to play a vital role in the response to and recovery from disasters. Some of the largest NGOs like the International Committee of the Red Cross have established an international and the grass level organization are successful in their activities that major bilateral development agencies like the US Agency for International Development, Office of Foreign Disaster Assistance, USAID and OFDA (Bennett and Oliver, 2002).

The International Red Cross

The International Red Cross or Red Crescent movements consist of the International Federation of Red Cross and Red Crescent Societies (IFRC) and the International Committee of the Red Cross (ICRC). The IFRC was founded in 1919 and has grown to be the world's largest humanitarian organization. The IFRC conducts complex relief and recovery operations in the aftermath of disaster throughout the world. Their four areas of focus include promoting humanitarian values, disaster response, disaster preparedness and health and community care. Through their work they seek to "improve the lives of vulnerable people by mobilizing the power of humanity" as stated in their mission (Haddow, Bullock and Coppola, 2011:283-286).

In 2010 the IFRC launched "strategy 2020" to guide the organization's efforts through the decade. This strategy focuses on three strategies.

1. Save lives, protect livelihood and strength recovery from disaster and crises.
2. Enable healthy and safe living
3. Promote social inclusion and a culture of nonviolence and peace.

The strategy directs the organization to pursue three "enabling actions" to deliver these three strategic aims,

1. Build strong national Red Cross and Red Cross crescent societies
2. Pursue humanitarian diplomacy to prevent and reduce vulnerability in a globalized world
3. Function effectively as the international federation

The IFRC has become increasingly engaged in disaster risk reeducation and emergency preparedness efforts and continues to promote hazards mitigation practices in the communities where they operate. These activities which focus on consequence reduction and working toward better disaster event prediction and prevention methods, have become more central to the goal of local red cross and red crescent society programs. The aim is most relevant to practices of international disaster management. The strategy 2020 describes their pre and post disaster action.

- Preparing and responding to disaster and crisis
- Recovery from disaster and crisis
- Our disaster management system ⁷

The International Monetary Fund

In the event of an international disaster or complex humanitarian emergency in a member country, the International Monetary Fund (IMF) utilizes its 'Emergency Assistance Specific Facility' to provide rapid financial assistance. In these situations, it is not uncommon for a country to have severely exhausted their monetary reserves. The IMF goals are to rebuild government capacity and to return stability to the local economy. In the event of a natural disaster, funding is directed towards local recovery efforts and for any economic adjustment that may be needed. The experience in the Gujarat, India earthquake provides an example of the overwhelming destruction a major disaster event in a developed country and the wide range of international organizations that become involved in response and recovery efforts. Similarly, the case studies of the El Salvador earthquakes and Hurricane Mitch in Guatemala demonstrate the devastating impact large natural disasters can have on a developing nation and the types of

⁷ The information has been accessed from <http://www.ifrc.org/> on 17/08/2016

international assistance provided to help these nations to respond effectively and to recover.

Role of International Organization in Mozambique

Mozambique is prone to a wide range of natural disasters, which regularly cause major damage and set back economic growth in the disaster affected areas. Mozambique is one of the poorest countries in the world and few would disagree that it has been ‘battered by colonial rule, civil war and famine’. It is more frequently and severely affected by natural disasters than virtually any other country in Africa. Throughout its recent history it has had to cope with a succession of floods, droughts and cyclones, which have had a devastating combined impact. The worst droughts were recorded between 1980 and 1983, which affected up to six million people. The two worst floods were in 2000 and 2001, which affected up to four and a half million. It has also been hit by a number of cyclones, the worst of which was in 1994, which affected two and a half million people (Foley, 2007).

In 2007, Mozambique suffered a double disaster of severe flooding in its central region river basins and a category four cyclone that devastated coastal districts in one of its southern provinces. Between 300,000 and 500,000 people are believed to have been affected by the two disasters through the loss of their homes or livelihoods. These simultaneous catastrophes seriously stretched the capacity of the national authorities and humanitarian agencies based in the country, and highlighted a number of issues related to coordination and communication between them. The emergency response was coordinated by the government of Mozambique’s Instituto Nacional de Gestão de Calamidades (INGC). It succeeded in evacuating up to 200,000 people from the flooded area without loss of life. Its emergency preparedness measures undoubtedly also reduced the number of deaths and injuries from the cyclone that struck around the same time⁸.

The two largest UN agencies in Mozambique, UNICEF and WFP, played the leading role in providing emergency relief along with the Mozambique Red Cross and a number of international on-governmental organizations (INGOs). Within two weeks of

⁸ The information has been accessed from <http://www.ifrc.org> on 31/08/2016.

the declaration of a ‘Red Alert’, WFP had distributed food aid to some 33,500 flood victims. UNICEF had provided water and sanitation supplies, including plastic sheets, chlorine, water tanks and latrine slabs. Other agencies ensured that emergency medical supplies were being provided and that people’s basic life-saving needs were being met. Over 100,000 people spent between one and three months living in the temporary accommodation centers before the flood waters receded. There were no major outbreaks of disease or any indications of serious excess morbidity rates in the centers. A subsequent evaluation of the international relief effort concluded that ‘the real needs for emergency relief were largely met’ by the operation (Recovery from Recurrent flood 2000-2013, Foley, 2007).

2.3.3 Japan, Indonesia and US Disaster Management system

Japan

Japan is a country which covers only 0.25 percent of land areas and geographical, topographical and meteorological condition the country is subject to frequent natural disaster such as typhoons, torrential rains and heavy snowfalls as earthquake and tsunami. In Japan, every year there is great loss of lives and property due to natural disaster. During 1950s large scale typhoons with earthquake caused damage and thousands of casualties. Thereafter, with the progress of society capabilities to respond to disaster and mitigate vulnerabilities to disasters by developing disaster management systems, promoting national land conservation, improving weather forecasting technologies and upgrading disaster information communications system (Disaster Management Plan in Japan , 2015)⁹

On 17 January 1995, an earthquake with a 7.3 on the Richter scale occurred at Awaji island of Hyogo Prefecture in Western Japan. It killed 6,434 people, injured 43,792 people, destroyed 104,906 houses, half destroyed 144,274 houses, and partially destroyed 390,506 houses. On 23 October 2004, the Mid Niigata Prefecture was affected by an earthquake with a 6.8 on the Richter scale. Landslides and destruction of buildings and houses caused 68 dead, and 4,805 injured. 3,175 houses were totally destroyed,

⁹The information has been accessed from <http://www.bousai.go.jp/kaigirep> on 20/07/2016.

13,810 houses were half destroyed, and 105,573 houses were partially destroyed¹⁰. On 11 March 2011, the largest earthquake hit Japan. Its epicenter was located in the coast of Sanriku and its epicentral area stretched from the coasts of Iwate Prefecture to Ibaraki Prefecture. According to the National Police Agency, this earthquake and tsunami have left unprecedented human suffering: 15,870 people dead, 2,814 people missing and 6,114 people injured, as well as property damage: 129,472 totally collapsed buildings, 255,977 half collapsed buildings and 702,928 partially collapsed buildings. Furthermore, the value of the destruction of the social infrastructure, housing, and corporate facilities was estimated at 16.9 trillion yen and it had a great impact on Japanese economy (Buerk, 2011).

Japan's legislative framework for the reduction of risk from natural disaster, which consists of the disaster countermeasure basic act and other legal instruments, covers a wide range of disaster related issues such as earthquake, tsunami, erosion, building standard, city planning, land use, road, landslide, typhoon, steep slope collapse, active volcanoes, fire, flood. The fundamental section of legislation related to disaster management in Japan is the Disaster Countermeasures Basic Act of 1961. This act provided guidelines for developing Japan's national and local disaster management offices and plans. The act addressed four basic disaster management functions: disaster management planning, disaster preparedness, disaster emergency response and financial measures for preparedness and recovery expenses (Tanaka, 2008).

The next section of legislation in Japan to address earthquakes was the Special Measures Law for Countermeasures against Large Earthquakes of 1978, mandating that preparations begin for the forecasted Great Tokai earthquake threatening Tokyo. This act enabled the central government to force the prefectural and local governments to take measures to increase their resilience. Following this act, the next big change to disaster management in Japan was the establishment of the Disaster Prevention Bureau and the National Land Agency in 1984. These two agencies work with the Cabinet Office to form the closest equivalent to FEMA Japan has. The Cabinet Office primarily assists with the

¹⁰The information has been accessed from <http://www.adrc.asia> on 25/08/2016.

development of legislation and disaster plans. The Disaster Prevention Bureau is primarily concerned with mitigation activities. The National Land Agency handles all disaster issues related to sustainable development (Britton, 2007). Further, based on the lessons learned from the Great East Japan Earthquake, a new chapter was created in December 2011, for Tsunami Disaster Countermeasures and changes were made in September 2012 and January 2014, reflecting amendment of the Disaster Countermeasures Basic Act and reflecting the study results by the Nuclear Regulation Authority (NRA) respectively. In November 2014, another change was made to reinforce the measures for removing unattended cars in case of emergency. A further change was made in March 2015, to enhance the nuclear disaster management system

The earthquake triggered a near-source tsunami with recorded wave heights of up to 10 meters that reached the coast in as little as 10 minutes. The Fukushima nuclear power plant lost electric generators and subsequently lost power, causing the reactors to overheat. Three of the nuclear reactors failed because of explosions in their cooling systems, and more than 200,000 people were evacuated from around the site. By April 2011, the nuclear reactor had reached a severity level rating of 7, the highest the scale goes and equivalent to that of the Chernobyl nuclear disaster (BBC, 2011)¹¹.

The JMA was able to warn a portion of citizens through their cell phones. Television stations immediately broadcasted the news, outlining the areas affected by the earthquake and covered by the tsunami warning. Communities hit by both the earthquake and tsunami were well educated on the risks associated with both disasters for their area and were generally well prepared for these events (Learning from Earthquakes, 2011)¹².

Many citizens had disaster preparedness kits on hand consisting of dry rations, water, a first-aid kit, and battery-powered radios (McCurry and Sample, 2011)¹³. The Japanese government had learned from Hyogoken-Nambu and had coordinated search and rescue teams which were ready and quickly deployed. The government was also quick to accept foreign aid and foreign workers. Shelters were quickly established in a

¹¹ The information has been accessed from <http://www.bbc.co.uk/news/world> on 26/09/2016.

¹² The information has been accessed from <http://www.udeledu> on 1/09/2016.

¹³ The information has been accessed from. <http://www.guardian.co.uk/world> on 07/09/2016.

combination of emergent and planned locations and were flooded with supplies. The argument that is currently developing is that Japan was not prepared for the maximum possible event; the country was focused on the maximum probable event. As with Hyogoken-Nambu, the Japanese had not prepared for an earthquake of this magnitude. In the preparedness plan established for the affected area, the maximum magnitude of the future earthquake was assumed to be Richter scale magnitude 8.0–8.3. Since earthquake magnitude is a logarithmic scale, there is a huge difference between a magnitude 8.3 and a magnitude 9.0 earthquake (Corben, 2011).

If this earthquake were to hit in the middle of the night without warning, the predicted death toll would be 7,900 to 9,200, with damage of up to US\$310 billion. The Japanese government established the Tokai Earthquake Preparedness Center to map the risk from this earthquake in order to increase preparedness and allow for resilience-building activities. The detail on these maps is impressive; as of March 2011, this center has mapped 6,449 areas prone to landslide and more than 58,000 houses at risk of fire following the earthquake. Strain meters are now in place surrounding the fault so seismologists can monitor any changes. Plans are already in place to send schoolchildren home and alert the country to the risk if these strain meters detect any changes, and emergency personnel are prepositioned in vulnerable areas (Achenbach, 2011).

The Central Disaster Management Council has developed the “Policy Framework for Large scale Earthquake Disaster Prevention and Reduction,” a master plan of the countermeasures for the large scale earthquake, that includes a range of activities from preventive measures to post-disaster response and recovery; the “Earthquake Disaster Reduction Strategy,” to determine an overarching goal of damage mitigation and strategic targets based on the damage estimation; and the “Guidelines for Emergency Response Activities,” which describes specific actions to be taken by related organizations. It is possible that an earthquake other than these large scale ones can hit any place in Japan as with the cases in the past 30 years. A guideline for the countermeasures against earthquakes by local municipalities has been compiled covering every step of the disaster response levels preparation, initial response, response, and recovery (Law and Regulation

for the Reduction of Risk from Natural Disasters in Japan)¹⁴ Japan's government has produced and distributed a guidebook for the public explaining the Tokai earthquake theory and telling families what they can do to prepare. Some of these activities include learning general information about earthquakes, securing furniture and glass, and setting up a family meeting place and disaster kit (city of Nagoya, 2004).

Indonesia

Indonesia is one of the most highly disaster-prone countries in the world. The Indonesian archipelago has some 17,000 islands out of which 6,000 are inhabited. In 2004 in Indonesia, Indian Ocean earthquake and tsunami left over 150,000 people dead and affected over 530,000 people. (Indonesian Disaster Management References Handbook, 2015)¹⁵ Legislative and regulatory framework of disaster management in Indonesia, since 2007 the Indonesian government has developed a legal framework to strengthen disaster risk management in the country by promulgating several laws, regulation, plans and policies. All 34 provinces of Indonesia have established provincial level Disaster Management Agencies (BPBDs) and have prepared Rencana Penanggulangan Bencana (RPB) or the Provincial Disaster Management Plan. More than 90 per cent of the districts and cities in Indonesia have their own local disaster management agencies. Disaster Risk Management Forums (FPRB) has been establishing in 19 provinces and 45 districts. The DRM Forums consists of the government and civil society members. According to the 2007 Disaster Management Act one of the key pillars in disaster management is transparency and accountability. BNPB has also reinforced its commitment for good governance with the enactment of Head of BNPB Regulation No. 10/2014 on Guidelines for Financial Accountability.¹⁶

Between 2005 and 2015, Indonesia made significant progress in mainstreaming DRR into national and local development. Substantial work has been done to improve disaster management during the last decade at the legislative, institutional and regulatory

¹⁴The information has been accessed from <http://drr-law.org/resources> on 07/09/2016.

¹⁵The information has been accessed from <http://www.flickr.com> 05/09/2016.

¹⁶The information has been accessed from <http://www.unisdr.org> on 14/07/2016.

levels, as well as at planning and programmatic levels. Disaster Management Offices have been established with operational disaster management plans in all the provinces of Indonesia. More than eighty per cent of the districts and cities in the country have also set-up their Local Disaster Management Offices (BPBDs) The Indonesian government has mobilized all the line ministries and agencies including the Ministry of Finance and the State Planning Board to support the effective integration of DRM into national and provincial development planning. Indonesia continues to take strides to ensure that all elements of disaster risk management are addressed, including DRR, from national to the community levels. Disaster risk reduction is being integrated into emergency preparedness through contingency planning processes at the national and local levels.

Post-disaster reconstruction policies have applied the principles of “building back better” and integrated DRR through human recovery principles. Several post-disaster areas have also developed specific programmes and activities with the aim of reducing physical and socio-economic vulnerabilities of the most disadvantaged communities. The government of President Joko Widodo has strongly maintained that it will focus national development efforts at the local and village level. Greater budget has been allocated to villages, and it is expected that DRR will become one of the priority programmes (Badan Nasional Penanggulangan Bencana and National Disaster Management Authority, 2015).

Flood Management in Jakarta

Jakarta is an example of dense cities that faces wicked disaster problem. It means beside the natural disaster events, Jakarta has already had problem in controlling massive development, which can potentially lead to environmental degradation and will exacerbate the impacts of disasters. One of the major disasters is flood. According to BNPB (2012), almost 63% flood incidents occurred during several years. Whereas, the flood infrastructures, such as east and west canals, have already built in 2010, but still Jakarta has many places flooded. RPB is a master plan for government agencies to conduct the program and for other stakeholders to participate in the disaster management program. RPB is made based on three levels of impacts, which are macro (national) level, mezzo (provincial) level, and micro (city level) (BNPB, 2012).

BPBD enhances its goals by focusing on risk reduction in holistic way. There are five objectives which cover: Strengthening legislation and institutional capacity; increasing coordination with the drafting of region regulations on disaster, Integrated Mitigation Plan; development of an integrated logistics distribution, Research, Education and Training; implementation of curriculum about disaster at schools, Increased capacity and participation of stakeholders; optimal application of technology by stakeholders, Protection of society from disaster: Construction of multi-disaster early warning system (BNPB, 2015).

Earthquake Management of Yogyakarta

In 2006 Yogyakarta was hit by earthquake with 6.3 magnitudes. As a result of this, more than 5000 people as victims and the damage of 370,776 units of private and public infrastructures (Public Works Ministry, 2006).

Shortly after an earthquake hit Yogyakarta, it became becoming chaos. At that time, disaster was not yet organized. The contribution of each element of society, both from the government, private sector, and international agency took place with minimal coordination. The vulnerable group in dealing with earthquake is about 30.1 % from population of Yogyakarta region. Moreover, beside an existence of vulnerable group, the most severe location is at South and East of Yogyakarta caused by density and loss of lot assets (BNPB, 2012)

Yogyakarta has already had institution and mechanism in place for coping disaster management, not only earthquake but also other type of disaster. BPBD Yogyakarta is very intense as a coordinating institution to interact with local and international NGO. There is also policies like Local Regulation No. 8 Year 2010 Implementation of Disaster Management at Province Level, Regulation of the Governor of DIY No 49 of 2011 on the Standard Operating Procedures for Disaster Management. BPBD Yogyakarta has also formulated the RPB based on the risk mapping above. The management planning has focused on the management cycle, which stated as follows: Pre Disaster: Compilation of integrative procedure operational, training and drilling to local government staff, private sector and society, re-manage building and land use

Response: Implementation of an integrated contingency plan, rescue and evacuation, *etc.*
Post Disaster: psychological rehabilitation, infrastructure development (BNPB, 2015)¹⁷

USA

The United States has traditionally operated under a shared governance system in which localities are responsible for most earthquake mitigation, preparedness, response, and recovery. Earthquake loss reduction efforts and their effectiveness have been controlled primarily by local governments. This level of governance is ultimately in charge of disaster preparedness and response; its authority cannot be pre-empted by the state or federal government. Localities' primary concerns are implementing disaster response plans, directing and carrying out all four stages of disaster response, and executing first responder duties. They mobilize their own police, fire, and medical services. The state can bring in the National Guard to assist if needed. The governor is typically the leading government official at the state level. The federal government concentrates on coordinating the emergency support functions of the federal agencies involved in disaster management (Greer Alex, 2012).

The federal government can ask that the military assist with a disaster and manage the urban search and rescue units (which are typically composed of individuals from the local area). The Robert T. Stafford Disaster Relief Act of 1988 (PL 100-707) gives the Federal Emergency Management Agency (FEMA) statutory authority for most federal disaster response activities (Waugh, 2007).

The state and federal governments can enact laws that require localities to include seismic safety elements in their policy, but they cannot penalize them if they fail to do so. Such policy is most common in states such as California and Alaska where earthquakes are an ever-present hazard. Lack of policy including seismic safety elements may become a big issue in the area surrounding the New Madrid fault (including the cities of Memphis, Tennessee, and St. Louis, Missouri). While there has not been a major

¹⁷ The information has been accessed from <http://www.give2asia.org/> on 16/07/2016.

earthquake in this area since settlement, geologic records confirm that this fault has the potential to create an earthquake of Richter scale magnitude 9. The states and localities have not made major efforts to be prepared for this sort of earthquake, and this plan, developed originally to help the government effectively respond to catastrophic earthquakes, has application to all types of hazards (Haddow et al., 2011).

In the United States, two major pieces of federal policy drive how the earthquake response network organizes itself: the Federal Response Plan (FRP), replaced by the National Response Plan (NRP) in 2004 and later by the National Response Framework (NRF) in 2008, and the National Incident Management System (Tierney, 2004). The FRP was introduced in February of 1992 as a means for the federal government to standardize its response to disasters to increase effectiveness. The FRP involves 27 federal agencies along with the American Red Cross. One of the most important pieces of the FRP was the emergency support functions (ESFs) it set forth to help organize the federal response. The 15 ESFs cover an array of tasks that are necessary, immediately following a disaster and assign responsibility for these tasks to federal agencies (Sylves, 2008).

On January 17, 1994, Richter scale magnitude 6.7 earthquake struck Northridge, California. This earthquake was triggered by the San Andreas Fault line and did most of its damage to Los Angeles and other areas along the San Fernando Valley (Sylves, 2008). The earthquake was responsible for 60 deaths, 7,000 injuries, and roughly \$40 billion in damage. A presidential disaster declaration was awarded almost immediately and FEMA spent \$7 billion on the recovery effort, making it second only to Hurricane Katrina among the costliest U.S. disasters (Haddow et. al, 2011).

Conclusion

The World Bank and UNDP define concepts of governance as the work out of economic, political, and administrative ability to manage a country's affairs at all levels and it brings together the actions of state actors, non-state actors, and private sector actors. Governance means action plan to reduce on impact on social issues, economic issues and culture issues in society. In governance the terms civil society and private institutions links with government for good governance. The concept of disaster

management defines as the body of policy and administrative decisions and operational activities that affect to various stages of a disaster at all levels. There are two type of action plan when dealing with Disaster management i.e. pre-disaster and post-disaster. The pre-disaster plans works on mitigation and preparedness through early warning system, awareness programs, workshop and seminar and post disaster plans work on response and recovery through relief, rescue, rehabilitation and construction etc. Whereas governance is concerned with “doing the right thing,” management is concerned with “doing things right”.

Governance helps in disaster risk reduction in numerous ways, including planning, designing, engineering, construction and maintenances of the built environment. Governance generally refers to the structure and processes for community organization and collection decision making among them, managing a disaster is itself a complex system which involves various specialization and organization scientist, government, media and public to work on disaster.

Over 2 million people died from natural disaster between 1970 and 2014 in the world. Earthquakes, floods and tsunamis were the main causes of deaths. Due to ever increasing adverse impacts of the disasters risk reduction has become a very demanding area in recent days. A disaster is natural or manmade that affects directly or indirectly the life of people in the world. The United Nations declared the decade from 1990 till 2000 as the international decade for natural disaster reduction. The major conference of the IDNDR programme was held in Yokohama in May 1994, where plans of action for disaster reduction called the Yokohama strategy was evolved. The international organization working on disaster reduction, The United Nation and its Organization, The International Federation of Red Cross and Red Crescent societies, The International Committee of the Red Cross, International Non- Governmental Agencies and National Organization. The United Nation and International Organization set up the disaster management system in every country through disaster management plans, especially those countries which are affected by natural disaster or man- made disaster. The UN helps in rescue and relief facilities during disaster, and sends large number funds to disaster prone countries.

Good practice of Disaster Management can be learnt from Japan, Indonesia and USA to reduce the impact. Japan is good at the best practice on earthquake and flood management system through early warning, rescue, relief and recovery system. USA is working on floods and climate change systems through international seminar, workshops and information system. Indonesia is the best for flood management through mitigation, preparedness and recovery plans. One of the best practices of Disaster management can be seen from Indonesian government which had made focus on development of local level disaster management plans and village has got own disaster management plans that become the pivotal for rescue, relief and mitigation during and after disaster.

CHAPTER -3

POLICIES AND PROGRAMMERS OF DISASTER MANAGEMENT IN INDIA

Introduction

India has been vulnerable, in varying degrees, to a large number of natural, as well as human-made disasters on account of its unique geo-climatic and socio-economic conditions. It is highly vulnerable to floods, droughts, cyclones, earthquakes, landslides, avalanches and forest fires etc. The total land covers an area of 3,287,590 sq. km (1,269,346 sq m), as the seventh largest country in the world, Out of 29 states and 7 union territories in the country, 27 of them are disaster prone. Almost 58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity; over 40 million hectares (12 per cent of land) are prone to floods and river erosion; of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis; 68 per cent of the cultivable area is vulnerable to drought and hilly areas are at risk from landslides and avalanches. India stands apart from the rest of Asia, marked off as it is by mountains and the sea, which gives the country a distinct geographical entity. Bounded by the Great Himalayas in the north, it stretches southwards and at the Tropic of Cancer, tapers off into the Indian Ocean between the Bay of Bengal on the east and the Arabian Sea on the west.

India is a disaster prone country due to a number of factors; which both natural and human induced, including unfavorable Geo climatic conditions, topographic features, environmental degradation, population growth, urbanization, industrialization, non scientific development practices, etc. The factors, accelerating the intensity and frequency of disasters are responsible for heavy toll of human lives and disrupting the life support system in the country. This chapter delineates different policies and programmes of Disaster Management in India, in the context of disaster management 2005 Act. The governance and its management in terms of disaster in India have been also examined. The works of the government and its scope in terms of disaster have been explained at national level.

3.1 DISASTER IN INDIA: AN OVERVIEW

India has been traditionally vulnerable to natural disaster on account of its unique geo-climatic conditions. Floods, droughts, cyclones, earthquakes and landslides have been recurrent phenomena. About 60 percent of the landmass is prone to earthquakes of various intensities; over 40 million hectares is prone to floods; about 8 percent of the total area is prone to cyclones and 68 percent of the area is susceptible to drought (Sharma and Khanna, 2013). In 2002 to 2013, India was among the five countries most frequently hit by natural disasters. These included the Indian Ocean Tsunami in 2004, which caused around 11,000 deaths and affected 2.79 million people in India, and the 2013 floods in Uttarkhand, which caused 5,748 deaths and affected 4,200 villages. Before this, India's major disasters included Cyclone Paradip in 1999, which caused around 10,000 deaths. According to the World Risk Index 2014, India is in the top half of all countries at risk from natural hazards – and, more importantly, for many years it has severely lacked the capacity to cope with and adapt to these hazards. India has suffered from many disasters in its recent history, both natural and climate related and these continue to cause devastation. In November 2015 floods in the southern city of Chennai, Tamil Nadu, killed over 370 people and damaged crops worth US\$190 (Bahadur, Lovell and Pichon, 2016).

In India, the cyclone which occurred on 25th November, 1839 had a death toll of three lakh people. The Bhuj earthquake of 2001 in Gujarat and the Super Cyclone of Orissa on 29th October, 1999 are still fresh in the memory of most Indians. The most recent natural disaster of a cloud burst resulting in flash floods and mudflow in Leh and surrounding areas in the early hours of 6th August, 2010, caused severe damage in terms of human lives as well as property. There was a reported death toll of 196 persons, 65 missing persons, 3,661 damaged houses and 27,350 hectares of affected crop area. Floods, earthquakes, cyclones, hailstorms, etc. are the most frequently occurring disasters in India (National Institute of Disaster Management, 2011, 2012).

Developed countries which have modern early warning systems and effective mitigation programmes are able to reduce the impact of natural hazards whereas countries with less preparedness and inadequate mitigation efforts suffer more from

natural hazards. In the case of India, the human and economic losses from disasters are high in comparison to many other developing nations (Sharma and Khanna, 2013).

In India Natural disasters are earthquake, cyclones, landslide, floods, drought and tsunami and man-made disaster are accidents, chemical leakage, in India Most frequently affected every year are floods, earthquake, landslide, drought and cyclone (Dar, 2009: 99-105). The country is highly vulnerable to droughts, floods, cyclones, avalanches, forest fires and landslide. Out of 29 states/union territories in the country, 27 are disaster prone. India has 55 percentage of the total land vulnerable to earthquake, 8 percentages prone to cyclones and 5 percent vulnerable to floods. West Bengal is most prone to four common disasters, i.e. floods, drought, cyclone and earthquake; seven states face three type of disaster, ten states face two types of disaster and six states faces one type of disasters (Disaster Management in India, 2012).

In past history of disaster in India, earthquake of Gujarat, Chamoli, Jabalpur, Latur, landslide in Garhwali and Kumaon, cyclones of Gujarat , Andhra Pradesh and Orissa, tornadoes of Balasore and Midnapore etc. past example of disasters show the disaster in India are resulting into loss of life and property (Sharma and Gangandeeep, 2009).

Table No. 3.1
Damage Caused By Natural Disaster in India 1990- 2000

Year	Number of people affected (in crore)	Number of house and building partially or totally damaged	Amount of property damaged (Rs. In crore)
1990	3.17	1019930	171.0
1991	3.47	1190109	190.0
1992	1.90	570969	205.0
1993	2.62	1529916	580.0
1994	2.35	1051223	183.0
1995	5.43	2088355	473.0
1996	5.49	2376693	543.0
1997	4.43	11035405	n.a
1998	5.21	1563405	n.a
1999	5.01	3104064	n.a
2000	4.16	2736355	1020.90

Source: Ministry of Home Government of India, Disaster Management of India, 2011.

The natural disaster directly affects lives and property. Drought causes heavy crops and livestock losses over wide areas of land. Cyclones, earthquake, floods and landslides cause both infrastructure and agriculture. In India every year natural disaster affected county economy and also property individual people of the country.

Table No.3.2
People Killed and Affects by Disaster in 1995-2014

Year	Total Number of People Death	Total Number of People Affected
1995-2004	84,449	718,693.662
2004-2014	28,777	144,142,963
2014	1,432	5,658,539

Source: National Disaster Management Authority, National Disaster Management Plan, 2016.

Above table shows disaster affect the people of India. Every year country suffer disaster. It is most important issue in India society. Floods frequently affect India. Landslides, earthquake and cyclone are other causes of disaster in India.

India Government Approaches to Disaster Management

The disaster management Act, 2005 defines disaster as “a catastrophe, mishap, calamity or grave occurrence in any area arising from natural or man-made cause or by accident or negligence which results in substantial loss of life or human suffering or damage to and destruction of property, or damage to or degradation of environment and is such a nature or magnitude as to be beyond the coping capacity of the community of the affected area” (Ministry of Law and Justice, 2005).

On 23 December 2005, the government of India defining step enacted the disaster management Act 2005, which envisaged the creation of the national disaster management authority (NDMA) headed by the prime minister, state disaster management authorities (SDMAs) headed by chief minister and district disaster management authorities (DDMAs) headed by the district collector or district magistrate or deputy commissioner and adopted a holistic and integrated approach to disaster management. It was a paradigm shift, from the erstwhile relief-centric response to a proactive prevention, mitigation and

preparedness driven approach for conserving development gains and to minimize loss of life, livelihood and property. The NDMA have the responsibility for laying down the policies, plans and guidelines for disaster management for ensuring timely and effective response to disaster. The Act lays down institutional, legal, financial and coordination mechanisms at the National, State, District and Local levels. These institutions are not parallel structures and will work in close harmony. The new institutional framework is expected to usher in a paradigm shift in DM from relief-centric approach to a proactive regime that lays greater emphasis on preparedness, prevention and mitigation (Disaster Management in India, 2005, National Policy on Disaster Management, 2009).

Evolution of Disaster Management in India

In India, the 1999 Orissa super cyclone, the 2001 Gujarat earthquake and the 2004 Indian Ocean Tsunami proved to be watershed events which catalyzed the enactment of a national law on disaster management. Legislation provides a formal basis for disaster management activities relating to preparedness, response, recovery and reconstruction. It supports organizational arrangements and plans, allocates major legal responsibilities all of which are crucial for proper implementation. By describing specific norms and procedures, laws, regulations and codes also create structures of incentives and disincentives (National Policy on Disaster Management, 2009).

In the past few decades, laws have been enacted in India to respond to sectoral issues, be it environmental protection or economic development. There was a need for one comprehensive law that cuts across all sectors with its holistic conception of disaster management. As legal frameworks and institutional arrangements are interlinked, a review of laws relating to disaster management would invariably involve an analysis of organizational structures at different levels, and their roles and functions (Disaster Management in India, 2012)

In India, Famine Codes developed in the 19th century provided a formal basis for disaster relief activities, as did the Relief Manuals introduced by States both before and after Independence. The Environment (Protection) Act, 1986 and a number of rules under

the Act were significant developments which followed the Bhopal gas disaster. Several other Acts, rules and codes relating to the subjects of water, air, fire, chemicals, micro organisms, among others, were enacted at the national and state level. The High Powered Committee (HPC) constituted by the Government of India, which submitted its report in October 2001, prepared a draft National Calamity Management Act as well as a Model State Disaster Management Act. While considering the recommendations of the HPC, the GOI took a view that instead of a central legislation, the States should be advised to enact their own respective legislations. One reason for this could have been that the Constitution of India does not explicitly mention disaster management as a subject in any of the three lists of the Seventh Schedule.

In the meantime, States such as Gujarat, Bihar, Uttar Pradesh and the then Uttaranchal enacted their own legislations on disaster management. However, in the aftermath of the 2004 Asian tsunami, the GOI decided that a central law on disaster management was essential. Thus the DM Act, 2005, which brought under its purview the entire country, was the culmination of a process that had started almost a decade earlier (Government of India, 2013).

3.2 LEGAL INITIATIVES, PROGRAMMER AND POLICIES

The institutional and policy mechanisms for carrying out response, relief and rehabilitation have been well-established since Independence. These mechanisms have proved to be strong and effective insofar as response, relief and rehabilitation are concerned.

National Disaster Management Authority (NDMA)

National disaster management authority is an agency of the ministry of home affairs who primarily purpose to coordinate response to natural disaster and manmade disasters. NDMA was established through the disaster management act 2005, the prime minister is the chairperson of NDMA. The NDMA, as the apex body for disaster management, is headed by the prime minister is the responsibility for laying down policies, plans and guidelines for DM and coordinating their enforcement and

implementation for ensuring timely and effective response to disaster. The NDMA is mandated to deal with all type of disaster natural disaster and man-made disaster. whereas, such other emergencies including those requiring close involvement of the security forces and intelligence agencies such as terrorism, law and order situations, hijacking, air accidents, mine disaster, port and harbour emergencies, forest fire and oil spills will contribute to be handled by the extent mechanism. The National Crisis Management Committee (NCMC) and NDMA may formulate guidelines and facilitate and preparedness activities. The cross cutting themes likes medical preparedness, psycho-social care and trauma, community based disaster preparedness, information and communication technology, training, preparedness awareness generation etc (Das, 2012).¹⁸

National Executive (NEC)

A National Executive Committee is constituted under Section 8 of DM Act, 2005 to assist the National Authority in the performance of its functions. NEC consists of Home Secretary as its Chairperson, *ex-officio*, with other Secretaries to the Government of India in the Ministries or Departments having administrative control of the agriculture, atomic energy, defense, drinking water supply, environment and forest, finance (expenditure), health, power, rural development science and technology, space, telecommunication, urban development, water resources. The Chief of Integrated Defense Staff of the Chiefs of Staff Committee, *ex-officio*, is also its Members. NEC has been given the responsibility to act as the coordinating and monitoring body for disaster management, to prepare a National Plan, monitor the implementation of National Policy etc. vide section 10 of the DM Act (Disaster Management in India, 2012).

State Disaster Management Authority (SDMA)

At the state level, the SDMA headed by the chief minister, will lay down policies and plans for DM in the state. It will inter alia approve the state plan in accordance with the guidelines laid down by the NDMA, coordinate the implementation of the state plan,

¹⁸ The information has been accessed from <http://www.ndma.gov.in> on 16/08/2016.

recommend provision of funds for mitigation and preparedness measures and review the development plans of the different department of the state to ensure the integration of prevention, preparedness and mitigation measures (Disaster Management in India, 2012).

District Disaster Management Authority (DDMA)

The DDMA will be headed by the district collector, deputy commissioner or district magistrate as the case may be, with the elected representative of the local authority as the co-chairpersons. The DDMA will act as the planning coordinating and implementing body for DM at the district level and take all necessary measures for the purpose of DM in accordance with the guidelines laid down by the NDMA and SDMA. Section 25 of the DM Act provides for constitution of DDMA for every district of a state. The District Magistrate/ District Collector/Deputy Commissioner heads the Authority as Chairperson besides an elected representative of the local authority as Co-Chairperson, except in the tribal areas where the Chief Executive Member of the District Council of Autonomous District is designated as Co-Chairperson. Further in district, where Zilla Parishad exists, its Chairperson shall be the Co-Chairperson of DDMA. Other members of this authority include the CEO of the District Authority, Superintendent of Police, Chief Medical Officer of the District and other two district level officers are designated by the state Government (Disaster Management in India, 2012, National Policy on Disaster Management, 2009).

The District Authority is responsible for planning, coordination and implementation of disaster management and to take such measures for disaster management as provided in the guidelines. The District Authority also has the power to examine the construction in any area in the district to enforce the safety standards and also to arrange for relief measures and respond to the disaster at the district level (Disaster Management in India, 2012).

Local Authorities

For the purpose of this policy, local authorities would include Panchayati Raj Institutions (PRI), Municipalities, district and cantonment boards and town planning authorities which control and manage civic services. These bodies will ensure capacity

building of their officers and employees for managing disaster, carry out relief, rehabilitation and reconstruction activities in the affected areas and will prepare DM plans in consonance with the guidelines of the NDMA SDMAs and DDMAAs. Specific institutional framework for dealing with disaster management issues in mega cities will be put in place (Disaster Management in India, 2012).

National Institute of Disaster Management (NIDM)

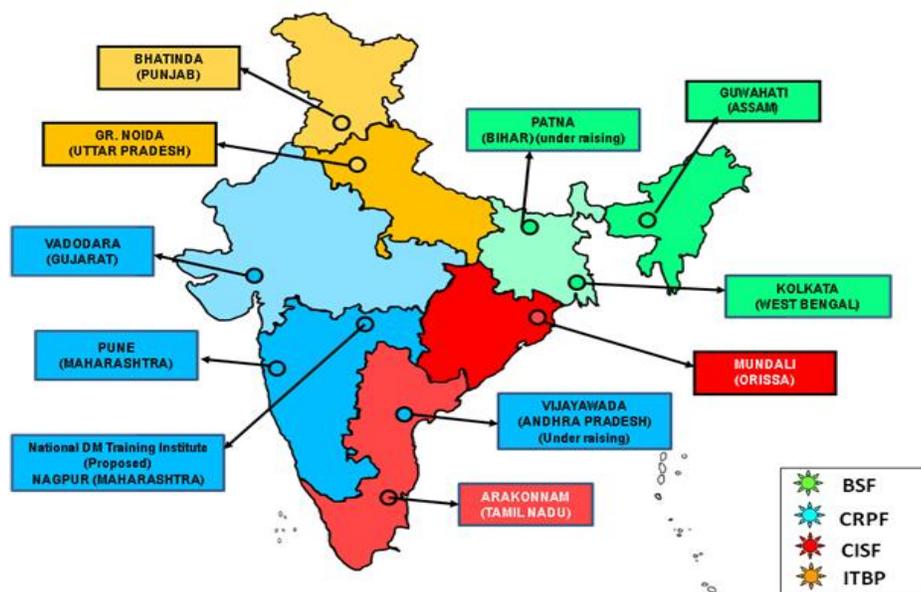
The International Decade for Natural Disaster Reduction (IDNDR), a National Centre for Disaster Management was established at the Indian Institute for Public Administration (IIPA) in 1995. The Centre was upgraded and designated as the National Institute of Disaster management (NIDM) on 16th October 2003. It has now achieved the status of a statutory organization under the Disaster Management Act, 2005. Section 42 of Chapter VII of the Disaster Management Act, 2005 entrusts the institute with numerous responsibilities, namely to develop training modules, undertake research and documentation in disaster management. The Union Home Minister is the President of the Institute. It was constituted on 23rd February, 2007 and has a general body of forty two members comprising of Secretaries of various ministries, departments of the Union Government and heads of national level scientific, research and technical organizations (National Policy on Disaster Management, 2009).

National Disaster Response Force

Two national calamities in quick succession in form of Orissa super cyclone 1999 and Gujarat earthquake 2001 brought about the realization of the need of having a specialist response mechanism at national level to effectively respond to disaster. The National Disaster Response Force (NDRF) has been constituted under Section 44 of the DM Act, 2005 by up-gradation/conversion of eight standard battalions of Central Para Military Forces i.e. two battalions each from Border Security Force (BSF), Indo-Tibetan Border Police (ITBP), Central Industrial Security Force (CISF) and Central Reserve Police Force (CRPF) to build them up as a specialist force to respond to disaster or disaster-like situations (Ministry of Home Affairs, Government of India 2010).

The eight battalions (1 battalion comprised of nearly 1000 person) of NDRF consist of 144 specialized teams trained in various types of natural, man- made and non-natural disasters. 72 of such teams are designed to cater to the Chemical, Biological, Radiological and Nuclear (CBRN) calamities besides natural calamities. Each NDRF battalion consists of 1149 personnel organized in 18 teams comprising of 45 personnel, who are being equipped and trained for rendering effective response to any threatening disaster situation or disaster, both natural and man- made. All these eight battalions are being trained in natural disasters while four of them are being additionally trained for handling CBRN disasters. These NDRF battalions are located at ten different locations in the country based on vulnerability profile of country and to cut down the response time for their deployment at disaster site (Disaster Management in India, 2012)¹⁹.

Figure No 3.1
NDRF base camps of India



Source: NIDM, National Level .Retrieved from <http://nidm.gov.in/pdf/dp/Nat.pdf>
Accessed on 23/09/2016.

¹⁹ The information has been accessed from <http://ndrfandcd.gov.in> 19/08/2016.

Mitigation Reserves

Experience in major disaster in the last decade has clearly established the need for prepositioning of some essential reserves at crucial locations, including some for the high altitude areas. These reserves are intended to argument the resources at the state level. Mitigation reserves will be placed at the disposal of the NDRF for enhancing their emergency response capabilities for assisting the state governments during disaster or disaster-like satiation (Disaster Management in India, 2012).

3.3 ISSUES AND CONCERN IN INDIA'S DISASTERS

In India, role of emergency management falls to national disaster management of India, a government agency subordinate to the ministry of home affairs. In India some common disaster are floods, cyclones, earthquake and landslide. This common disaster regularly affects life of people in India. In 2016 disaster is reported by news, north east earthquake, 8 people killed and 85 are injured, in Uttar Pradesh, Bihar, Uttarkhand, Rajasthan and Madhya Pradesh are worst affected by floods and 35 people death ,1000 people are homeless and Arunachal landslide.

Disaster Concerned Distinctive Region of India

As far as the vulnerability to disaster is concerned, the five distinctive regions of the country i.e. Himalayan region, the alluvial plains, the hilly part of the peninsula, and the coastal zone have their own specific problems.

Table No 3.3
Region wise Disaster in India

Region	Disaster
Himalayan	Earthquakes and landslides
Plain	Floods
Desert	Drought and famine
Coastal zone	Cyclones and storms

Source: NIDM, 2012.

While the Himalayan region is prone to disasters like earthquakes and landslides, the plain is affected by floods almost every year. The desert part of the country is affected by droughts and famine while the coastal zone susceptible to cyclones and storms.

The natural geological setting of the country is the primary basic reason for its increased vulnerability. The geo-tectonic features of the Himalayan region and adjacent alluvial plains make the region susceptible to earthquakes, landslides, water erosion, etc. Though peninsular of India is considered to be the most stable portions, but occasional earthquakes in the region shows that geo- tectonic movements are still going on within its depth. The tectonic features, characteristics of the Himalaya are prevalent in the alluvial plains of Indus, Ganga and Brahmaputra too, as the rocks lying below the alluvial plains are just extension of the Himalayan ranges only. Thus this region is also quite prone to seismic activities. As a result of various major river systems flowing from Himalaya and huge quantity of sediment brought by them, the area is also suffering from river channel siltation, resulting into frequent floods, especially in the plains of Uttar Pradesh and Bihar (Negi, 2009).

The western part of the country, including Rajasthan, Gujarat and some parts of Maharashtra are hit very frequently by drought situation. If Monsoon worsens, the situation spreads in other parts of the country too. The disturbance in the pressure conditions over oceans, results into cyclones in coastal regions. The Geo-tectonic movements going on in the ocean floor make the coastal region prone to tsunami disaster too. The extreme weather conditions, huge quantity of ice and snow stored in the glaciers, etc. are other natural factors which make the country prone to various forms of disasters (Disaster Management Status Report, 2004).²⁰

Along with the natural factors human induced activities like increasing demographic pressure, deteriorating environmental conditions, deforestation, unscientific development, faulty agricultural practices and grazing, unplanned urbanization, construction of large dams on river channels etc. are also responsible for accelerated impact and increase in frequency of disasters in India (National Institute of Disaster Management, 2012).

²⁰ The information has been accessed <http://www.ndmindia.nic>. on 28/11/2016.

Earthquakes

India has been divided into four seismic zones. According to the maximum intensity of earthquake expected of these, zone V is the most active which comprises of whole of North East India, the northern portion of Bihar, Uttarkhand, Himachal Pradesh, J&K, Gujarat and Andaman & Nicobar Islands. India has highly populous cities and the constructions in these cities are predominantly not earthquake resistant. Regulatory mechanisms are weak, thus any earthquake striking in one of these cities would turn into a major disaster (GoI-UNDP Disaster Risk Reduction Programmer, 2009-2012).

Six major earthquakes have struck different parts of India over a span of the last 15 years. The entire Himalayan Region is considered to be vulnerable to high intensity earthquakes of a magnitude exceeding 8.0 on the Richter Scale, and in a relatively short span of about 50 years, four such major earthquakes have occurred in the regions: Shillong, 1897 (M8.7); Kangra, 1905 (M.8.0); Bihar–Nepal, 1934 (M 8.3); and Assam–Tibet, 1950 (M 8.6). Scientific publications have warned that very severe earthquakes are likely to occur anytime in the Himalayan Region, which could adversely affect the lives of several million people in India (Negi, 2009).

Table No 3.4
Earthquakes in India

Date	Location	Magnitude
10 June 2008	Tibet	6.4
27 June 2008	Andaman island	6.7
28 June 2008	Andaman island	6.1
25 August 2008	Tibet	6.4
8 October 2008	Andaman island	6
10 November 2009	Nicobar island	6.1
30 march 2010	North off coast of Andaman island	6.8
12 June 2010	Off west coast of Nicobar island	7.8
18 June 2010	Andaman island	6
10 November 2010	South east India ridge	6.3
18 sep 2011	Indo-Nepal border in Sikkim	6.9

Source: Ministry of Home Affairs Government of India, Disaster Management in India, 2011.

In India earthquake is most destructive of life and property. Himalayan region and coastal areas are most vulnerable to earthquake. In recent year, Sikkim is also affected by

earthquake. Earthquakes are considered as one of the most destructive natural disaster and can produce many types of losses, including physical, social-economic and cultural losses (Shaw, 2015). In India 12 percentage area prone to severe earthquake such as in Gujarat, 18 percentage areas is prone to earthquakes like in Latur and Uttaranchal and 25 percent area is exposed to relatively less severe earthquake as in Jabalpur and its adjoining areas (Satendra,2003). The effects of earthquake are landslide, damage to life property, damage to government infrastructure, fire hazards, landmass deformation and flash foods (Jain, 1998).

A Study of Uttar Pradesh and Gujarat Earthquake

Uttar Pradesh: a severe earthquake occurred in Garhwali region of Uttar Pradesh on 20th October 1991. The magnitude of earthquake was measured 6.6 on Richter scale and its epicenter was at Angola, a place near Uttarkashi. Mild tremors are a regular feature of the area. The worst affected areas have been in the district of Uttarkashi, Tehri Garhwali and Chamoli while it also caused sizeable damage in the districts of Dehradun, Tehri Garhwali and Nainital. The roads and bridges are the chief means of communication in hill region, which underwent heavy damage. The economy of such places is based on tourism to a great extent, which suffered a great set back. The overhead drinking tanks and pipelines had developed cracks. Sources of drinking water had been damaged. The earthquake caused intensive damaged to the building of various government department, forest, home finance and rural development (Vinita et al, 2016).

Gujarat earthquake: On 26th January 2001 in Gujarat earthquake Richter scale 7.9, the epicenter was a small town called Bhuj. The Gujarat earthquake in India, it was recorded that almost 20,000 people died, 166,000 were injured, and 600,000 left homeless and almost 35,000 homes were destroyed. Twenty one out of 25 districts in the state were totally destroyed and Kutch was worst affected district, followed by Ahmadabad, Jamnagar, Rajkot and Surendranager. Damage to roads affected the transportation or ports and Gujarat was the second most industrialized state in India, the earthquake totally destructed communication, transportation and electricity gas supplies (Satendra, 2003).

Landslide

The term landslide includes all varieties of mass movement of hill slopes and can be defined as the downward and outward movement of slope forming materials composed of rock, soil, artificial fills or combination of all these materials along surfaces of separation by failing, sliding and flowing, either slowly or quickly from one place to another. The landslides are primarily associated with mountains terrain. These can also occur in areas where an activity such as surface excavations for highway, buildings and open pit mines takes place (Choudhary, 2010:280).

Landslides mainly affect the Himalayan region and the Western Ghats of India. Landslides are also common in the Nilgiri range. It is estimated that 30 percent of the world's landslides occur in the Himalayas. The Himalayan Mountains, which constitute the youngest and most dominating mountain system in the world, are not a single long landmass but comprises a series of seven curvilinear parallel folds running along a grand arc for a total of 3400 kilometers. Due to its unique nature, the Himalayas have a history of landslides that has no comparison with any other mountain range in the world (Parkas, 2012).

Landslides are also common in Western Ghats. In the Nilgiri, in 1978 alone, unprecedented rains in the region triggered about one hundred landslides which caused severe damage to communication lines, tea gardens and other cultivated crops. A valley in Nilgiris is called "Avalanches Valley". Scientific observation in North Sikkim and Garhwali regions in the Himalayas clearly reveal that there is an average of two landslides per sq. km. The mean rate of land loss is to the tune of 120 meter per km per year and annual soil loss is about 2500 tons per sq km. Landslides constitute a major natural hazard in our country, which accounts for considerable loss of life and damage to communication routes, human settlements, agricultural fields and forest lands. Based on the general experience with landslides, a rough estimate of monetary loss is of the order of ` 100 crore to ` 150 crore per annum at the current prices for the country as a whole (Prakash and Awasthi, 2004, Prakash, 2011).

A landslide hazard is one of the most significant hazards that affect different part of India every year during the rainy seasons. The occurrence of landslides is a common phenomenon in the Himalaya. In the recent past there were few landslide disasters in Uttaranchal Himalaya. The landslide disaster at Malpa in the Kali valley occurred on 18th August 1998, which completely destroyed the habitation and wiped out temporary shelters of pilgrims going to Kailash-Mansarovar causing a death toll of more than 200 peoples. The Mandakini Valley of Rudraprayag district has been struck by several landslides as a result of heavy precipitation in the 3rd week of July, 2001. The important among them are Phata and Byung Gad landslides which killed 20 lives along with several injured. The landslide occurred in Uttarkashi on 24th September, 2003 has deposited a huge quantity of debris at the foot hill which caused a huge loss of property (Rajarithnam and Ganapathy, 2006).

From 10 to 15 November 2009, in the landslide of Nilgiris, total 1150 landslide and landslip were reported within five days. The landslide in Nilgiris is worst in India, about 80 human lives were lost and 3785 houses were damaged and part of roads and railway lines were totally damaged. Nilgiris district of Tamil Nadu is most prone to landslide in India (Ganapathy and Sekar, 2012). The landslide of mountain region in rising problem is increase population and also increase in infrastructural construction has led to increase in the probability of landslide occurrence. The various landslide triggers rainfall erosion, deforestation, earthquake, construction, infrastructural ,geological causes etc. in north east landslide take place most frequently during the monsoon period (Thakur,1996).

Landslide is one of the main Natural Hazards causing enormous loss in life and property in the landslide prone hilly terrain of our country every year during the Monsoon period and also in the event of Earthquake. About 15% land area i.e. about 0.49 million square kilometer of our country covering the entire Himalayan Mountain Chain, North east parts of India, parts of the Eastern Ghats and the Western Ghats and Nilgiri Hills in the southern parts of our country is highly susceptible to landslide (Geological Survey of India).

Landslides are amongst the most damaging natural hazards in the mountainous terrain like Himalaya. Landslides constitute one of the major natural catastrophes, which account for considerable loss of life and damage to communication routes, human settlements, agricultural and forestland. Most of the terrain in mountainous areas have been subjected to slope failures under the influence of variety of terrain factors and figured by events such as extreme rainfall or earthquake. In India, landslides are occurring frequently in Himalayan region in North east India (Rai, Kumar and Mohan, 2014)

Landslides may be caused either by natural process or human activity or combination of both. In many cases, modifications in hill slopes are carried out with or without proper slope stability analysis. In other cases, stable slopes are converted into unstable slopes by the people residing in the area by artificial modification or alterations of the hill slope without basic knowledge of hill slope management. Such cases are very common in the hilly terrain including north east India and they have caused loss of many lives even though the sizes of such landslide are very small (Singh and Singh, 2013).

Impact of these landslides in the north eastern part of the Himalayas in India is severe because of the excessively high rate of precipitation during the monsoon (June–October) which acts as a cardinal triggering factor (Sarkar et.al. 2010). Landslides, as natural hazards, create havoc on the civic infrastructure and generate heavy economic losses as well as loss of human lives. Landslides are triggered frequently due to the rugged topography, complex geological structures, intensive rainfall and unplanned urbanization in Sikkim (Hindayar et.al, 2016).

Flood

Flooding constitutes the most prevalent and costly natural disaster in the world (Kyu-Cheoul Shim et. al 2002). Floods are defined as a moderately high flow of water discharged from river and stream network, which sets the riverbanks margins to overflow and lead to the flood of low land areas surrounding the riverbed. It is essentially a physical phenomenon. Floods arise from abnormally heavy rains, dam failures, snow melts, river blockage. Flood disaster ranks second only to drought in total number of

people affected worldwide (Kumar, 2009). The flood can be divided into three categories as river floods, coastal floods and flash floods. The nature of flood problem varies from one river system to another (Satendra, 2003: 128-138). Brahmaputra River: the main problem of floods in the northeastern region arises from the Brahmaputra Rivers and its tributaries. The river in monsoon season overflows its banks and causes a great damage to life of people and property (Mohapatra and Singh, 2002).

Ganga river system: in the region the northern tributaries of Ganga, namely the Sharada, the Ghaghar and the Gandak cause extensive flood along their banks. Drainage congestion is confined to the northwestern parts of Uttar Pradesh, Mathuri, and Agra suffering most. Bihar suffers a considerable amount of damage due to the flood of Burhi Gandak, the Bagmati, the Kamla Balan, the Koshi and the Mahanadi. In Bengal region Bhagirathi, the Ajoy and the Damodar causes extensive flood. In Delhi and Haryana it is Yamuna, the biggest tributary of the Ganga, which causes a marginal total of floods (Kumar, 2009: 20).

A Study of Floods

On 18 August 2008, the Koshi River burst through its eastern bank about 13 km upstream of the Koshi Barrage in Nepal, 8 km north of the Indian border. This created major flooding in Nepal and India. In India, Bihar is worst affected by flood and the affected districts of Supaul, Saharsa, Madhepura, Araria and Purnia. A total area of close to 3700 sq. km, 30 percent of the affected areas districts, was inundated, affecting 412 Panchayats and 993 villages and 3.3 million People were affected by flood. Approximately 493 lives were lost and 3,500 were reported missing after the disaster. According to Government of Bihar report on 236,632 houses were fully or partially destroyed across the districts of Supaul, Madhepura, Saharsa, Araria, and Purnea. The estimated damage is Rs. 5,935 million (US\$ 134.9 million). Of these, the first three districts were the worst hit with over 95 percent of the reported damage. Roads and Bridges: About 1800 kilometers of paved and unpaved roads and about 1100 bridges and culverts were destroyed in the floods (National Institute of Disaster Management, 2012)

Over 350,000 acres of paddy, 18,000 acres of maize and 240,000 of other crops were adversely affected, impacting close to 500,000 farmers. Approximately 10,000 milk animals, 3000 draught animals, and 2500 small ruminants perished in the disaster. Over 90 percent of the flood affected population was dependent on agricultural livelihoods which were severely affected. The Government of Bihar (GoB) was extremely proactive in relief operations in the immediate aftermath of the flood. An emergency response effort was initiated by the State government with assistance from the Indian Army, Air Force, Navy, National Disaster Response Force (NDRF), as well as a number of international and national relief organizations. The State Government set up 360 relief camps within school and college buildings and tents to house evacuees. At peak, more than 440,000 people were living in camps (Government of Bihar, 2010)²¹.

Cyclones

Cyclones are the centers of low pressure surrounded by closed isobars having increasing pressure outward and closed air circulation from outside towards the central low pressure in such a way that air blows inward in anticlockwise on northern hemisphere and clockwise in southern hemisphere. From location viewpoint cyclones are classified into two principal type e.g. extra-tropical cyclones and tropical cyclones (Kumar, 2009: 21-23).

India with a long coastline of 8041 km. is exposed to on average 5-6 tropical cyclones from the Bay of Bengal and Arabian Sea annually. Cyclones are very common in pre-monsoon (may-June) and post monsoon (October- November) seasons in country. Andhra Pradesh 1996, Gujarat 1998 and Orissa 1999 cyclones are the recent cyclones which caused colossal loss to life and property (Satendra, 2003:6-7).

According to report of disaster management in India, 2012, India has a coastline of about 7516 km, and it is exposed to nearly 10 percent of the world's tropical cyclones. About 71 percent of this area is in ten states (Gujarat, Maharashtra, Goa, Karnataka, Kerala, Tamil Nadu, Pondicherry, Andhra Pradesh, Orissa and West Bengal). The islands of Andaman, Nicobar and Lakshadweep are also prone to cyclones. On an average, about

²¹ The information has been accessed from <https://www.gfdrr.org> on 09/09/2016.

five or six tropical cyclones form in the Bay of Bengal and Arabian sea and hit the coast every year. A severe super cyclonic storm with winds of up to 250 km/hour crossed the coast in Orissa On October 29, 1999. This may have been the worst cyclone of the country in the Orissa region and was responsible for as many as 10,000 deaths, rendering millions homeless and extensive damage to property and environment (Disaster Management in India, 2012).

Droughts

The term drought is used for a situation of significant water shortage and due to insufficient rainfall or increase in water demands. Drought is a most frequently occurring disaster in India.

Drought is the most widespread hydro-meteorological syndrome of 'prolonged period of water scarcity affecting natural resources, environment and, thereby, the people'. Environmental changes, viz. climate change, land-use changes and natural resource degradation have aggravated drought occurrences and vulnerability, thus disrupting the normal socio-economic settings. All the regions of India suffer with drought incidences of varying periodicity, with 13 states repeatedly declared as drought-prone. Regions of Rajasthan, Karnataka and Orissa are typical examples of drought-related deprivation and resultant conflicts, whereas droughts in states like Chhattisgarh, Punjab, Haryana, etc. are the result of improper agriculture practices and poor water management (Gupta and Tyagi et.al . ,2011).

The primary cause of any drought is deficiency of rainfall and in particular, the timing, distribution and intensity of this deficiency in relation to existing reserves. A prolonged period of relatively dry weather leading to drought is a widely recognized climate anomaly. Drought can be devastating as water supplies dry up, crops fail to grow, animals die, and malnutrition and ill health become widespread. The environmental effects of drought, including Salinization of soil and groundwater decline, increased pollution of freshwater ecosystems and regional extinction of animal species. Since 2001, India has experienced three major droughts in the years 2002, 2004 and 2009, severely

affecting the various sectors and overall economic development of the country. India in 2002 experienced its worst drought in 20 years (Disaster Management India, 2012).

Drought conditions are induced by low precipitation or when monsoons are delayed. It is observed that 16 percentage of country's total area is prone to drought affecting 50 million population annually .If drought conditions go unnoticed, they culminate into a natural calamity (Bajpai, et.al. 2005). Generally this occurs when a region receives consistently below average precipitation. It can have a large impact on the ecosystem and agriculture of affected region. Although drought can persist for several years, even a short, intense drought can cause significant damage and harm the local economy (Choudhary, 2010:92-93).

3.4 DISASTER MANAGEMENT IN SIKKIM

Disaster management set up legislative responsibilities of disaster management act 2005, objective of DM in Sikkim to build a safe and disaster resilient Sikkim by developing a holistic, proactive, multi-disaster oriented and technology driven strategy through a culture of prevention, mitigation, preparedness and response. With the capacity building and trainings provided, the community participation should be encouraged. The participation of community will guarantee local ownership, local needs and will provide effective volunteerism during the disaster. Hence, the disaster resilient community will ensure disaster resilient state²².

Sikkim State Disaster Management Authority

Sikkim State Disaster Management Authority (SSDMA) is a part of the State Government and is a nodal institution for planning, co-ordination and monitoring for disaster prevention, mitigation, preparedness and management. SSDMA lays down policies on disaster management for the state. It approves disaster management plan in accordance with the guidelines laid down by National Authority and co-ordinates its implementation. It provides guidelines and reviews the measures being taken for mitigation, capacity building

²² The information has been accessed from <http://www.ssdma.nic.in> on 23/07/2016.

and preparedness by the Government and issue guidelines as necessary. SSDMA recommends provision of funds for mitigation and preparedness measures. (Sikkim State Disaster management plan, 2011).

District Disaster Management Authorities (DDMAS)

District Disaster Management Authorities (DDMAS) headed by the District Collector or District Magistrate or Deputy Commissioner as the case may be, to spearhead and adopt a holistic and integrated approach to DM. There will be a paradigm shift, from the erstwhile relief-centric response to a proactive prevention, mitigation and preparedness-driven approach for conserving developmental gains and to minimize loss of life, livelihood and property (Sikkim State Disaster Management Plan, 2011).

History of Disaster in Sikkim

Sikkim is a mountainous state which is crisscrossed by narrow valleys and steep cliffs. It has a fragile ecology being the steepest and the highest state in India, and the third highest landscape globally. It is located in the highest seismic zone and has weak geological formations, comprising of sedimentary and low grade metamorphic rocks which are prone to landslides. The State also experiences heavy monsoons with an average rainfall to the tune of 2800 mm. Cupped in the lap of eastern Himalaya, the North East State of Sikkim falls in high seismic zone V (National Institute of Disaster Management, 2012).

The region has experienced relatively moderate seismicity in the past, with 18 earthquakes of Magnitude 6.9 or greater over the past 35 years within 100 kilometers of the epicenter of September 18 event. The largest of them was of Magnitude 6.1 in November, 1980. The last significant earthquake in the region occurred in February, 2006 measuring 5.3 on Richter scale.

An earthquake measuring 6.8 on Richter scale occurred on September 18, 2011 in Sikkim Nepal border region. The epicenter of the earthquake (27.7°N , 88.2°E) was located near the Sikkim-Nepal border, about 68 km northwest of Gangtok, Sikkim at a shallow depth of about 19.7 km. The earthquake caused strong shaking in many areas

adjacent to its epicenter lasting for about 30-40 seconds. It was widely felt in all North East of India, West Bengal, Bihar, Uttar Pradesh, Haryana, Rajasthan including capital city Delhi. The Indian Meteorology Department recorded two aftershocks of M 5.7 and M5.1 within two hours and another of M 4.6 at 3:21 am on 19th September, 2011 (Sikkim Earthquake, 2011).

Table No 3.5
Affect of Earthquake in Sikkim 2011

Human lives lost	60
House damaged	34,159
Government building damaged	1,255
Roads damaged (in kilometers)	3,230
Village footpaths	1,596
Bridges damaged	8,135
Water supply damaged	1,529
Minor irrigation works damaged	204
Flood control management works damaged	533
School damaged	759
Hospitals	377
ICDS damaged	875
Historic monuments, monasteries and religious institutions damaged	259
Gram Panchayats offices damaged	60
Community toilets damaged	155
Village level cooperatives damaged	49
Rural product marketing center damaged	8

Source: SSDMA, Sikkim State Disaster Management Plan, 2011.

Total numbers of houses were damaged in varying degree 4,125 houses were completely destroyed, 17,026 houses required major repairing and 21,929 needed minor repairing. Out of a total of 779 schools in the States, 759 schools were damaged. Children fall in vulnerable group and children in primary classes are more vulnerable to disasters. Hence, in the case of Sikkim, since all schools have primary classes, they all become more vulnerable. Gangtok, besides being the capital of the State is also its most populated city with maximum infrastructure. Most of the buildings withstand the quake on that fateful night, except the main secretariat, police headquarters and school buildings.

On 2011 earthquake caused 300 landslides which occurred all over the state and disturbed the road connectivity to major towns like Mangan, Chunthang, and Lachung

and even NH31A, main route connecting Sikkim and West Bengal. It was followed by road blocks, falling boulders, lake bursts and flash floods with incessant rain which continued for over a week after the earthquake. On 18 September 2011 Earthquake of magnitude of 6.9 on Richter scale struck Sikkim. This earthquake caused huge destruction of property and loss of lives. Sikkim one of the states of North east India falls in the seismic Zone-IV, while other states of the region in the highest seismic risk Zone-V. The destructions and aftermath of the earthquake hazard will definitely help in the planning of seismic mitigation in this region (Sikkim State Disaster Management Plan, 2011).

Government Initiatives and Programmes

Response: Heavy rain, fog and blocked roads prevented the rapid deployment of rescue workers in the initial phase of the earthquake response. Rescue teams experienced difficulties in accessing some of the remote worst affected areas in north Sikkim and in the eastern region of Nepal that borders the State. As heavy rains eased on 22 September, relief teams reached the worst affected areas in northern Sikkim State by Indian Air Force's (AIF) helicopters (Sikkim earthquake, 2011).

Massive operations were launched to rescue the injured and trapped population from the buildings and houses by the state administration along with the army, ITBP, SSB, NDRF, central government and state agencies. About 103 relief camps were made operational in the entire four districts and 14360 members of the affected community were accommodated and provided with food, clothing and medical care. The relief camps were set up in almost every gram Panchayati units. The State government declared an ex gratia payment of Rs 5 Lakh each to the next of kin of the deceased while the central government announced an ex gratia payment of Rs 2 Lakh. The central government also gave Rs 1 Lakh for the injured persons while the state government gave Rs 50,000/- to the families of each injured person (National Institute of Disaster Management, 2012).

Rehabilitation and Recovery: Several steps were taken at the central and state level to rehabilitate the affected community and to “build back better”. The central and the state government worked together towards reconstruction and rehabilitation in such a way so

as to mitigate any such future disaster. The Prime Minister Shri Manmohan Singh announced an assistance of Rs.1, 000 crore to the State of Sikkim to meet the requirements of relief and rehabilitation in the wake of the massive destruction caused by the earthquake. The central government assured the Sikkim government of “every possible assistance” to manage effectively the task of reconstruction, rehabilitation and re-development”. The Sikkim government was also advised to learn from its experience by using proper building technology and building by-laws so as to be better prepared in the event of recurrences of earthquakes (Sikkim earthquake, 2011)²³.

An expert’s team on earthquake-resistant technology was sent by the Centre to assist the State in rebuilding its infrastructure and to make Sikkim a model State in earthquake mitigation and to show the way to other earthquake-prone States in the country. The Ministry of Power had also asked the National Hydro Power Corporation (NHPC) to extend all possible assistance to State Government of Sikkim to bring normalcy to the earthquake affected areas near NHPC’s Teesta Hydel Power Station and Rangit Hydel Power Station in the State. It was decided to avail the services of seismic experts from IIT Roorkee to analyse the earthquake data and conduct the earthquake impact study at the dam sites of NHPC in the region and more specifically those in Sikkim (National Institute of Disaster Management, 2012).

Conclusion

India is highly vulnerable to natural disaster due to its location and geographical setting. The prevention of loss to life and property due to natural calamities is being viewed very seriously by the Government of India. In the past, the main role played by the Government in the case of various disasters was confined mainly to post-disaster activities that included providing relief and organizing rehabilitation. The disaster management mechanism was carried out by the Government in June 2002 and the subject of disaster management was shifted from the Ministry of Agriculture to the Ministry of Home Affairs. The latter was declared as the nodal ministry for coordination of relief and response and overall disaster management.

²³ The information has been accessed from <http://sikenvis.nic.in>

The Disaster Management Act, 2005, was enacted on 23 December 2005 and the National Disaster Management Authority, a statutory body under the chairmanship of the Prime Minister as provided for in this Act, was set up. At the state level, each state government is to set up a state disaster management authority under the chairpersonship of the chief minister. At the district level, the collector/district magistrate/ deputy commissioner is the chairperson of the district disaster management authority and directs, coordinates and supervises disaster management activities.

In India policies and programmes implemented by government of India, the national policy on disaster management to minimize the losses to lives and property, caused by natural disaster or manmade disaster with build a safe or disaster resilient. To promote culture of prevention, preparedness and resilience at all levels the state disaster management policies on disaster have been implemented for relief and mitigate during disaster. While significant achievements have been made, the case on post disaster still poses challenge to the government and the people. Sikkim is highly prone to Natural disaster events such as earthquake, landslides, flashflood etc. Landslides and earthquake has frequently affected life of people. On 18 September 2011 earthquake of Sikkim experiences worst affected people are helpless during the disaster.

CHAPTER -4

ISSUES AND CONCERN OF DISASTER MANAGEMENT: A STUDY OF SIKKIM

Introduction

Sikkim is situated between 27° 04' to 28° 07' North latitudes and 88° 01 to 88° 55' East longitudes. It is bounded by Nepal in the West, by the vast stretches of the Tibetan plateau in the North and by Bhutan and Chumbi valley of Tibet in the East. Darjeeling district of West Bengal stretches along its southern boundary. Sikkim is divided into four districts East, West, North and South. The State of Sikkim has a total area of 7096 sq km and is stretched over 112 kms from north to south and 64 kms from east to west. Around 81 percent of the geographical area of Sikkim covers by forest. More than 64 percent of the populations are depended on agriculture for their livelihood directly or indirectly. According to 2011 census the total population of Sikkim is 610,577 of which male 288,484 and female 252,367.

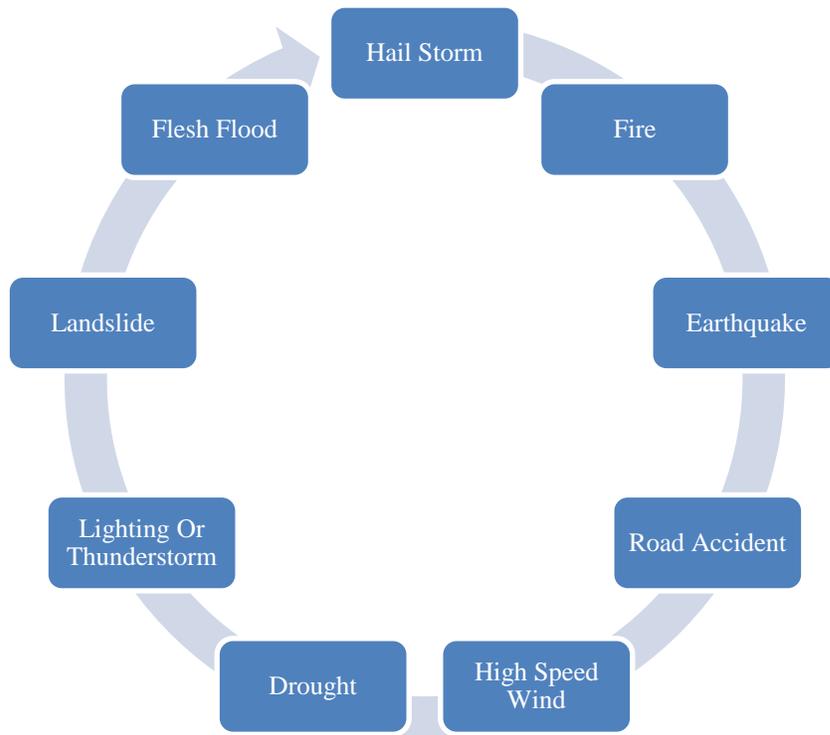
Sikkim is a land locked Himalayan State with no air, rail and water transportation facility depend on road transportation. Communication and transportation plays a vital role in the life of people on wake of disaster. During the monsoon season, heavy rain cause widespread damaged along the road network. The national highway connects Gangtok to Siliguri, which is a major town in the west Bengal. The nearest airport and rail station Siliguri is 117 kms from Gangtok. The state has 2 Hospitals, 4 District Hospitals, 24 Primary Health Centre, 147 Primary Health Sub-Centre and the state has 471 schools. Sikkim, being hilly state is mostly affected by the natural disaster of landslides, earthquake, flash flood, high speed wind, drought, forest fire and hail storm, its lies under seismic zone IV and V which is known as a very high risk zone. In case of Sikkim disaster management plans developed under the disaster management act 2005 of India. Sikkim state disaster management authority and district disaster management department are working on disaster mitigation likes landslides mitigation, school safety and earthquake recovery are major work on disaster.

In this context, the main objective of this chapter is to understand people's perception of Disaster Management in Sikkim and how it deals with the roles and activities of various actors and institutions involved during pre-disaster and post-disaster governance. This chapter also tries to explore people's perception about Disaster Management in Sikkim. Further it helps to understand the people knowledge on disaster management through mitigation, preparedness, response and recovery on local level and policies and programmes proper implementation at local level.

4.1 DISASTER MANAGEMENT IN NORTH SIKKIM

North Sikkim is largest district of Sikkim and its districts headquarters is in Mangan. It is the seventh least populous district in country out of 640 districts of India. North districts are situated on north latitude between 27° 41' 23", east longitude between 88° 31' 44". The total geographical area of North Sikkim is 4226 km with an elevation 610 meter. The north district is almost 60 percent of the total area of the state. It is bounded on the east by Tibet, North by China, on the South by East district and the west by Nepal. The total population of North Sikkim is 43354, where males are 24513 and females are 18841. This district is divided into four blocks namely Mangan, Passingdong, Kabi-Tingda and Chunthang. There are 21 gram Panchayats units and 331 inhabited villages. The everyday people experienced kinds of disaster, during rainy season as most pertinent outcome of this rainfall is the landslide causing many deaths and danger for the region in North Sikkim.

Figure No. 4.1
Type of Disaster experienced in North Sikkim



Source: Sikkim State Disaster Management Authority, Land Revenue & Disaster Management Department Government of Sikkim, 2012

In North Sikkim different kinds of disaster like earthquake, landslides, flashflood, hail storm, lighting or thunderstorm, drought, high speed wind, fire and road accident occurs. Each change of seasons creates some kind of disaster in this region. One of the most occurring disasters in this region is earthquake and landslide which has created much of chaos among the people as well as the government.

Table No. 4.1
Types of Disaster, Time of Occurrence, Impact and Vulnerable Areas

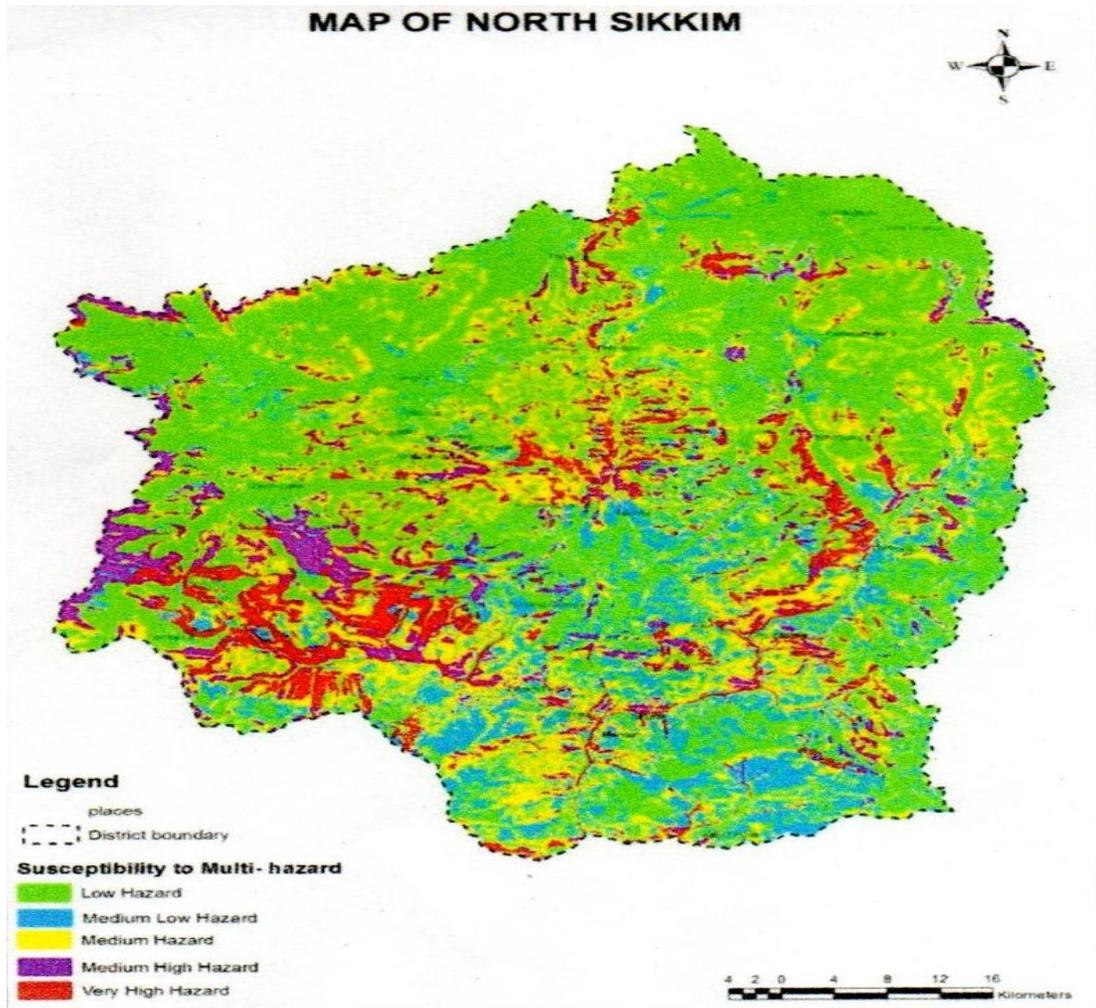
Type of Hazards	Time of Occurrence	Potential Impacts	Vulnerable Areas
Landslide	May-August	Loss of life, livestock, crops and infrastructure	Entire districts major landslide area: namok Khola, Dikchu, Pazingreet, entire Mangan, Singhik, Lanthey Khola, Meyong and Richum
Avalanche	July-September	Loss of life, crops infrastructure and animals	Lichen, Lachung, Thangu, Yumthang, Keshung (Dzongu)
Drought	July-September	Loss of crops, water scarcity	Entire district
Hail Storm	March-May	Loss of life	-do-
Epidemics	Any Time	Loss to human life	-do-
Fire Accidents	November- January	Human loss and house damaged	Entire districts especially lichen and Lachung
Earthquake	Any Time	Loss of life, livestock and infrastructure	-do-
Heavy Rainfall	June- August	Loss of crops	-do-
Flash Flood	June- August	Loss of crops, damage, infrastructure, houses, bridges etc.	-do-

Source: District Disaster Management Plan, North Districts, 2010 .Retrieved from: <http://www.ssdma.nic.in/disaster> Accessed on 23/09/2016.

During rainy seasons, the entire major river's water level rise which poses potential threat of flood. The most dangerous threat it poses during rainfall is its effects on crops. This rainfall not only devastates crops but also becomes the source of epidemics, fire accidents which is one of the serious problems in Lachen and Lachung in the North district. This is mostly due to the peculiar housing pattern adopted in the Lachen and Lachung. These houses are normally built of wooden planks made out of timber, bamboo and straw. Any occurrences of fire destroy houses and properties, causing serious damaged to the already affected people. Sometimes rain at the proper time either defers commencement of agricultural operations or affects growth of crops. Occurrence of drought is not as frequent in North districts as it lies on the coastal belt of

Tista River. The past occurrences show that the entire district is prone to drought. The earthquake causes or damages the lives of people, infrastructure and one of the most negative implications is the possibility can never rule out as it can happen any time.

Figure No. 4.2



Source: NIDM Sikkim. Retrieved from: <http://nidm.gov.in/pdf/dp/Sikkim.pdf>. Accessed on 21/11/2016.

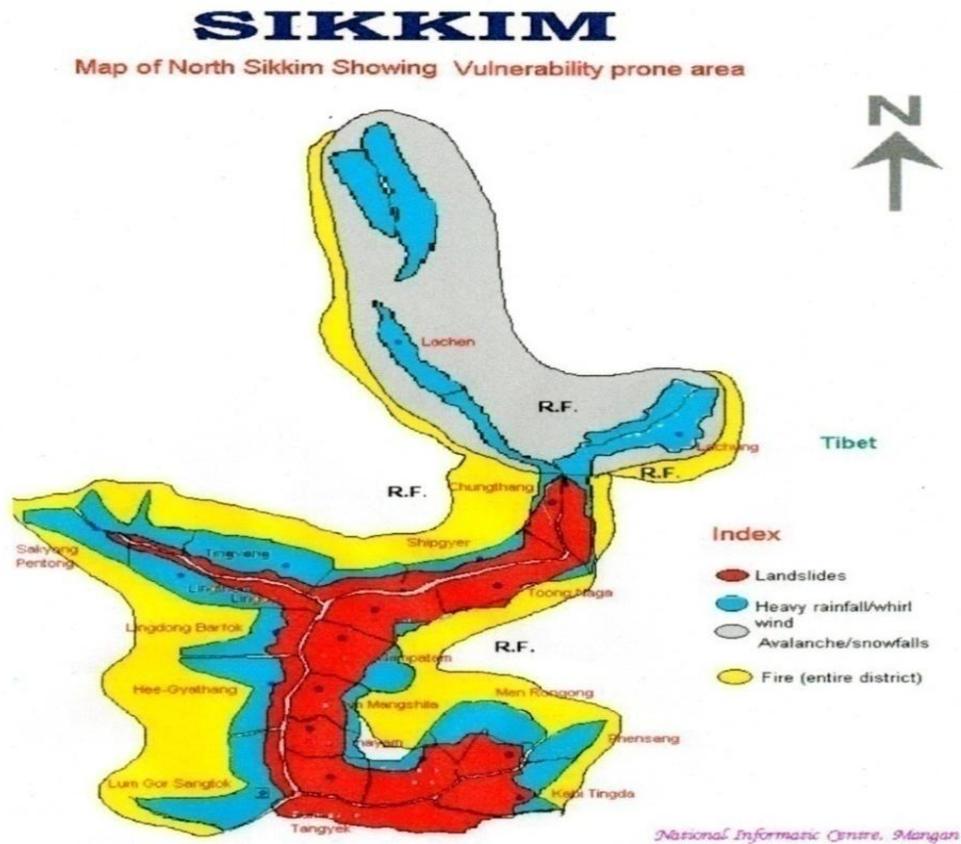
Table No. 4.2
Prone areas in North Sikkim

Prone Areas in North Sikkim Hazards	% of Area	% of Household	Risk
Very High Hazards	5.16	2.15	Very high
Medium High Hazards	10.91	6.23	High
Medium Hazards	22.71	29.04	Medium
Medium Low Hazards	25.07	36.54	Low
Low Hazards	36.15	26.04	Low

Source: NIDM Sikkim. Retrieved from: <http://nidm.gov.in/pdf/dp/Sikkim.pdf>. Accessed on 21/11/2016.

The above table and figure gives the brief detail of the scales and areas of hazards in the North Sikkim. As mention earlier that the North Sikkim is very prone to many natural hazards to which many lives were taken and also hampered the economy of the State. The above table and figure brings out the areas where there are less hazards and more hazards in the North district the green areas in the above map show the areas where there is less hazards, blue indicates medium low hazards, yellow area indicates medium, purple medium high and the red one indicates very high hazards. The most important observation that can be drawn from the above map is that there is not a single area to which there were no traces of hazards. The overall areas of the North Sikkim is engulf with hazards from low to very high with high risk.

Figure No.4.3
Types of Disaster in North Sikkim



Source: District Disaster Management Plan, North Districts, 2010 .Retrieved from: <http://www.ssdma.nic.in/disaster> Accessed on 23/09/2016.

Above map shows disaster prone areas in North Sikkim. The land is affected by landslide, forest fire heavy rainfall which causes heavy wind, avalanches or snowfall. The red portion in the map shows the area where people were settled which is very prone to landslide. This red line also indicates the parts where the river Teesta flows which are very dangerous when heavy rainfall occurs during summer season.

Figure No. 4.4
Health Institutes in North Sikkim



Source: District Disaster Management Plan, North Districts, 2010 .Retrieved from: <http://www.ssdma.nic.in/disaster> Accessed on 23/09/2016.

Above map shows the health institutes in North Sikkim. There is one district hospital in Mangan, three public health centers in Phodong, Chunthang and Passingdong and 19 sub centers. During the disaster hospital, PHC and sub center plays vital role in saving the life of people in this area. These centers and hospital is the first mode of response when disaster occurs. But most of the households are very far away from these centers. The most important issues is that the centers doesn't have proper infrastructures and medicine during emergency or normal situation. Most of the areas lack of proper road infrastructure which creates extra burden to the people.

Figure No. 4.5

Public Infrastructure in North Sikkim



Source: District Disaster Management Plan, North Districts, 2010 .Retrieved from: <http://www.ssdma.nic.in/disaster> Accessed on 23/09/2016.

The above map shows location of public infrastructure, in North Sikkim as there are 5 police station, 6 police out post and 3 military base camps. During the disaster police station, military base and police out post play important role to rescue people from affected areas and also one of the most informative agencies regarding information about disaster and its prevention.

Figure No. 4.6
Education institutes In North Sikkim



Source: District Disaster Management Plan, North Districts, 2010 .Retrieved from: <http://www.ssdma.nic.in/disaster> Accessed on 23/09/2016.

Above maps shows education institutes in North Sikkim. Education institutes are important to save place of public during disaster.

4.2 DATA INTERPRETATION AND ANALYSIS

The study has been conducted in Mangan, Mangshila, Singhik, Lanthey and Mantam (Dzongu), these areas are most vulnerable in parts of North Sikkim. These areas are constant victims of landslide, earthquake etc. In order to understand the Governance and Disaster Management this study has been conducted in North Sikkim one of the districts of Sikkim. The total respondent has been taken is 100. To understand the governance and management in terms of pre and post disaster occurrence the gender of the respondents, age group, education, occupation, income and comments etc are taken into accounts.

Table No. 4.3
Area Wise Classification of Respondents

Category of Respondents → Name of Study area ↓	Students	Government employed	Private employed	Local Leaders	Business	Others	Total
Mangan	8	10	1	0	2	4	25
Singhik	6	7	4	4	2	2	25
Mangshila	5	5	1	5	4	5	25
Lanthey and Mantam	5	6	2	1	4	7	25
Total	24	28	8	10	12	18	100

Source: Field Work²⁴, 13 to 24 October 2016.

Above table shows area wise classification of respondents. The area has been dividing into three places Mangan, Mangshila and Singhik each of 25 respondents and Lanthey and Mantam (Dzongu) included 25 respondents. The most of the respondents are people who are government employs around 28 percent, the other are the students around 24 percent, private employs consists of 8 percent, around 10 percent consists of local leaders, 12% are businessmen and rest 18 are from other category. Most of the respondent was government employed because in disaster management plans employed

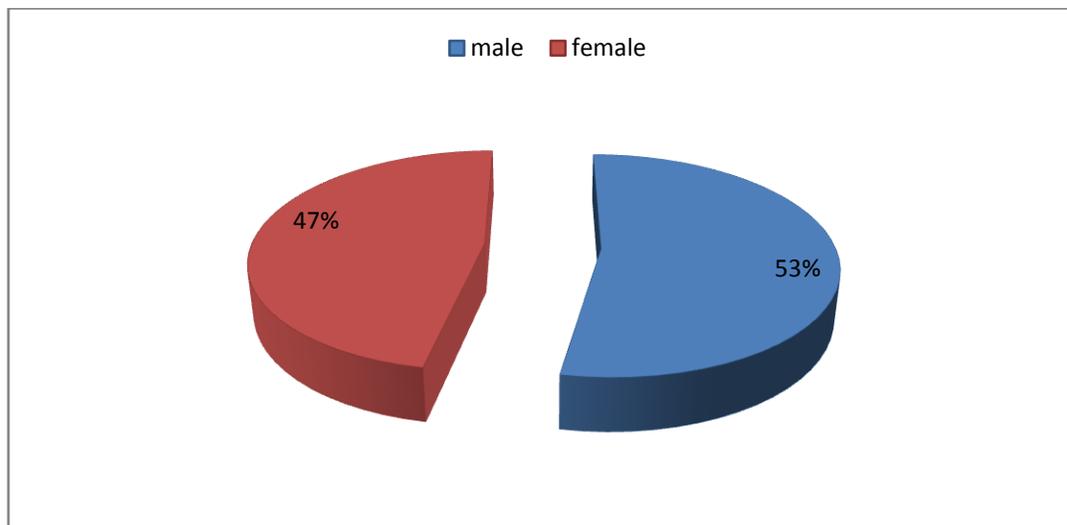
²⁴ Fieldwork has been conducted during 13 to 24 October, 2016 at Mangan, Mangshila, Singhik and Lanthey and Mantam, North Sikkim. Hereafter it is referred as field work.

respondent have better knowledge and students are involved in awareness programmes in schools. In study area, private employed are less in number as most of them were not interested and some people are working under hydro power company and teaching on private schools.

4.2.1 Socio Economic Status of Respondents

To understand the socio- economic status of respondents Gender, Age, Qualification and Occupation has been taken in consideration to understand the concept of Governance and disaster management. In order to know the people's view regarding socio economic status, a close ended question was posed to the respondents.

Figure No. 4.7
Gender of the Respondents



Source: Field Work, 13 to 24 October 2016.

The field survey was conducted in North Sikkim and the total sample population comprised of 53 percent male populations and 47 percent female population. Emphasis is given on gender to understand their knowledge, preparedness and experiences in pre and post disaster. During the time of the field study women were more inclined to give information about the disaster. The women were more informative as compared to male respondents.

Table No.4.4
Age group of Respondents

Sl. No.	Age Group (Years)	Male	Female	Total Respondents	Male%	Female %	Total Percentage
1	10 to 20	11	7	18	11%	7%	18%
2	21to40	34	27	61	34%	27%	61%
3	41 to 60	4	11	15	4%	11%	15%
4	Above60	4	2	6	4%	2%	6%
5	Total	53	47	100	53%	47%	100%

Source: Field Work, 13 to 24 October 2016

The respondents were from different age groups. Maximum importance was given to respondent above the age of 10 years and preferential above twenty 20 years. The number of respondent of the age groups between 21 years 40 years was predominant, going higher than 61 percent of the total respondents. In selecting the age groups of the respondent, the age of 10 years are taken in the lower limit and the age of above 60 years is counted as the upper limit.

Table No.4.5
Educational Qualifications of Respondents

Sl. No.	Qualification	Male	Female	Total Respondents	Male%	Female%	Total Percentage
1	I to X	10	12	22	10	12	22%
2	XI to XII	25	20	45	25	20	45%
3	BA	12	6	18	12	6	18%
4	Above BA	5	7	12	5	7	12%
5	Diploma	1	2	3	1	2	3%
6	Total	53	47	100	53	47	100%

Source: Field Work, 13 to 24 October 2016

Maximum importance was given to respondents at least who have formal education. It can be better understanding in terms of critical issues. 22 percent of them

had education between class I to X standard and another 45 percent of total respondent were from XI to XII standard, 18 percent of respondent were BA (graduation) and 12 percent of respondent were above BA (graduation), only 3 percent of respondent were diploma. Most of the respondents were from X to XII, this age group predominantly. As the education is the one of the most initial stage in terms of disaster is concerned. As it was found most of the respondents were educated and have some kind of information about disaster and how to prepare during the time of calamities.

**Table No.4.6
Occupation of Respondents**

Sl. No.	Occupation	Male	Female	Total Respondents	Male%	Female%	Total Percentage
1	Student	14	10	24	14	10	24
2	Government employed	12	16	28	12	16	28
3	Private employed	3	5	8	3	5	8
4	Local leaders	6	4	10	6	4	10
5	Business	6	6	12	6	6	12
6	Other	12	6	18	12	6	18
7	Total	53	47	100	53	47	100

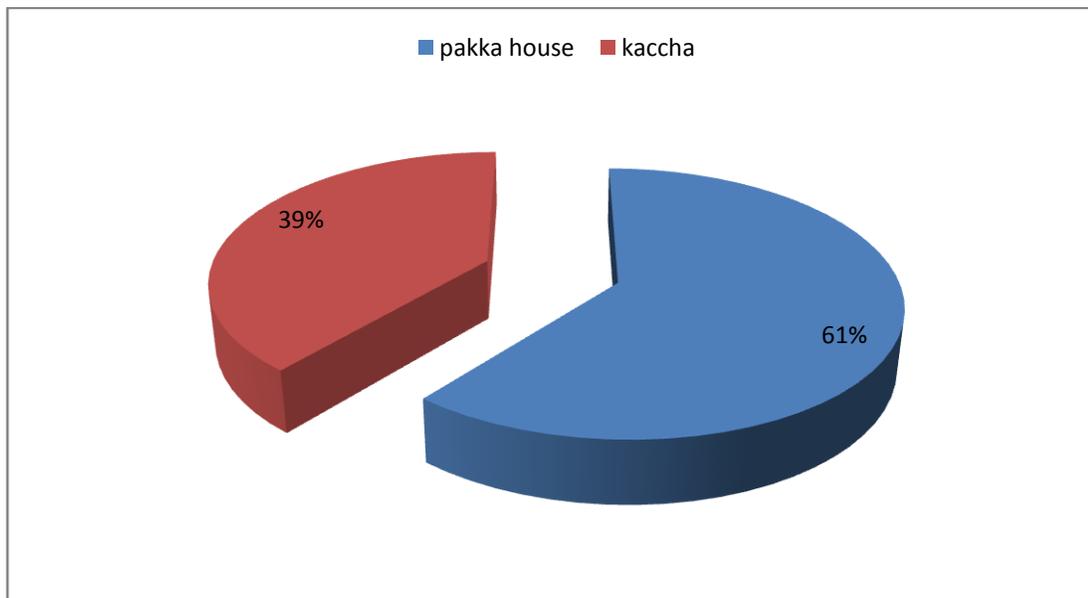
Source: Field Work, 13 to 24 October 2016

The occupations of the respondents have been divided into student, government employed, private employed, local leaders business and other like social workers, social works, local contractors, taxi drivers, youth and workers. Around 24 percent of respondents were students, 28 percent of respondents were government employed, 8 percent of the respondents were private employed, 10 percent of the respondents were local leaders, 12 percent of the respondents were business, and 18 percent of the respondents were other. According to occupation most predominantly occupation is government employed.

4.2.2 Living Area

The surrounding environment is also great indicator during disaster as much of the casualties that occurs due to the types of the houses. Not only that the available facilities like the police station, fire station, hospital, health center community hall, panchayat house, ICDS and school are also great indicators in time of emergencies. House is significant factor of the responds during disaster and living area depend on human cost of people in their area. According to government of India, house is divided into two type Kaccha and Pakka house. In order to know the people's view regarding the living part of life, a close ended question was posed to the respondents.

Figure No.4.8
Category of House



Source: Field Work, 13 to 24 October 2016

The above figure reveals that most of the respondents were living in the pakka house around 61 per cent and around 39 per cent are living in kaccha house. It has been seen that during the times of disaster most of the houses are affected or destroyed irrespective of their structure like kaccha or pakka. But most of the houses that have been destroyed by the disaster are kaccha house. Most of the houses are made out of

wooden and bamboo straws mixed with the red mud which not so much durable in times of natural disasters.

Table No.4.7
Facilities within 5 km

Sl. No.	Within 5 km	Male	Female	Total Respondents	Male%	Female %	Percentage
1	Hospital	1	3	4	1	3	4
2	Health center	8	10	18	8	10	18
3	Police station	2	3	5	2	3	5
4	Fire station	3	1	4	3	1	4
5	School	12	10	22	12	10	22
6	Panchayats house	10	6	16	10	6	16
7	ICDS	16	10	26	16	10	26
8	Community hall	1	4	5	1	4	5
9	Total	53	47	100	53%	47%	100%

Source: Field Work, 13 to 24 October 2016

Above the table show available facilities for the people within five km. The highest numbers of respondents having ICDS is around 26 percent, followed by school around 22 percent, around 18 percent health care centers, 16 percent panchayat house, 5 percent community hall, 4 percent hospitals and 4 percent fire stations. The other places are at least 10 km away from Mangan. Most of the villages have ICDS and schools, only one hospital and community hall in Mangan so other place like Mangshila, Lanthey and mantam are far away from Mangan. In case of Mangan there are fire station, police station and zilla Bhawan In case of Mangshila there are 5 schools, thigchim and Namok health center cover with 4 km from Mangshila and Panchayats house. In case of Mantam its 3 km away from Passingdong PHC and schools. In case of Singhik and Lanthey it covers Singhik PHC and schools. The relevance of this institution around the areas is that it can act as the first aid in times of disaster and can help in reducing the casualties.

Most of these institutions have been the source of aid in times of emergency in North Sikkim.

4.2.3 Disaster

Most of the respondent experiences different kind of disaster in their locality. Disaster is divided into two type manmade disaster and natural disaster and most frequently disaster are of natural disaster in their locality and already most of the respondent is lost their property and life.

Table No. 4.8
Types of Disaster

Respondent of study area ↓	Disasters occur or occurred					
	Earthquake (%)	Landslide (%)	Floods (%)	Fire (%)	Other specify (%)	Total (%)
Mangan	12	7	1	3	2	25
Singhik	11	5	4	2	3	25
Mangshila	9	11	-	3	2	25
Lanthay and mantam	6	12	2	3	2	25
Total (%)	38	35	7	11	9	100

Source: Field Work, 13 to 24 October 2016

Above table shows types of disaster i.e. earthquake, landslide, floods, fire and other specify like hail storm, drought, lightning and wind storm. Area wise in Mangan 12 percent is affected by earthquake, followed by 7 percent landslide, 3 percent fire, 2 percent other like hail storm, wave and 1 percent floods like flash floods occurs. In Singhik 11 percent earthquake, followed by 5 percent landslides, 4 percent floods, and 3 percent others, 2 percent fire. In Mangshila 11 percent landslides, 9 percent earthquake, 3 percent fire, 2 percent other. In Lanthay and mantam 12 percent landslide, 6 percent earthquake, 3 percent fire 2 percent floods and other.

The most pertinent disaster that occurs is the earthquake i.e. 38 percent, followed by 35 percent landslide, 11 percent fire, and 9 percent other and 7 percent floods.

Earthquake and landslide are most frequently occurred natural disaster in the study area. The increasing number of earthquake and landslide and the 2011 earthquake's damages are still the major sources of landslide during the time of rainy seasons in the study area. The time of August is the major months that landslide occurs. Lanthey, Mantam and Mangshila people are affected by landslide every year. Around 25 to 30 houses are damaged during the time of rainy season and Mantam primary schools also damaged once. Other specific disaster is hailstone, lightening and accident major disaster.

Table No.4.9
Damage and Destruction made by Disaster

Respondent of study area ↓	Damaged of Disaster (%)					
	Land (%)	Livestock (%)	Agriculture (%)	House (%)	Other (%)	Total
Mangan	4	1	4	14	2	25
Singhik	5	1	4	12	3	25
Mangshila	5	3	4	11	2	25
Lanthay and Mantam	5	3	5	8	4	25
Total (%)	18	8	17	45	11	100

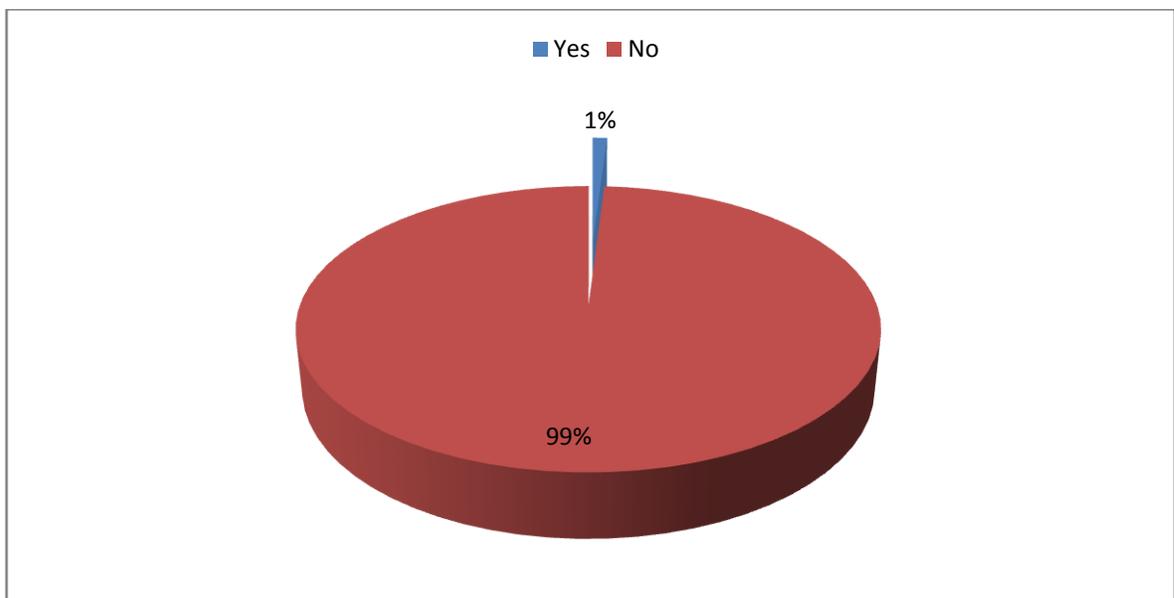
Source: Field Work, 13 to 24 October 2016

Above table shows the damaged made by disaster which are divided into land, livestock, agriculture, house and other like drainage, construction, cultural heritage etc. Mangan has the highest damages in terms of houses i.e. 14 percent followed by 4 percent land and agriculture, 2 percent other and 1 percent livestock. In Singhik 12 percent house followed by 5 percent land, 4 percent agriculture, 3 percent other and 1 percent livestock. In Mangshila 11 percent house damaged followed by 5 percent land, percent, and 3 percent livestock. In Lanthey and Mantam 8 percent house damaged, 5 percent land and agriculture, 4 percent other and 3 percent.

Over all damaged to houses is 45 percent, damaged to lands 18 percent damaged to agriculture 17 percent damaged to other 11 percent and damaged to livestock 8 percent. During the 2011 earthquake most of the area is worse affected as most of the housing, schools and hospitals were damaged. Every year landslide creates extra burden

on people as most the time this landslide due to heavy rainfall creates damage to land, property etc and not only that it also creates burden to the government as it also affects the drainage system and bridges. One of the most dangerous effects of landslide was on 13 August 2016 landslide of Dzongu of small village Mantam, which has created chaos not only the property of the people but also their cultural heritage too. This landslide has created a sort of migration of these people to different places in Sikkim.

Figure No.4.9
Casualties by Disaster



Source: Field Work, 13 to 24 October 2016

The above figure reveals that most of the respondents haven't lost any member in times of disaster. Around 99 percent of them haven't lost any member and around 1 percent only have lost their dear ones in road accident caused by landslide.

4.2.4 Pre-Disaster and Post-Disaster Plan

Pre disaster actions are those which are taken to reduce human and property losses caused by a hazard. As it also carry out awareness campaigns, preparation disaster management plans at house hold level and community level. The pre disaster within period is term as mitigation and preparedness and Post disaster actions taken in response

to disaster with a purpose to achieve early recovery and rehabilitation of affected communities, immediately after a disaster. The post disaster period is recovery and response.

Mitigation

In order to know the people's view on mitigation in their locality, a close ended question was posed to the respondents taking effective way to communicate information regarding disaster and any skill training and workshops on disaster.

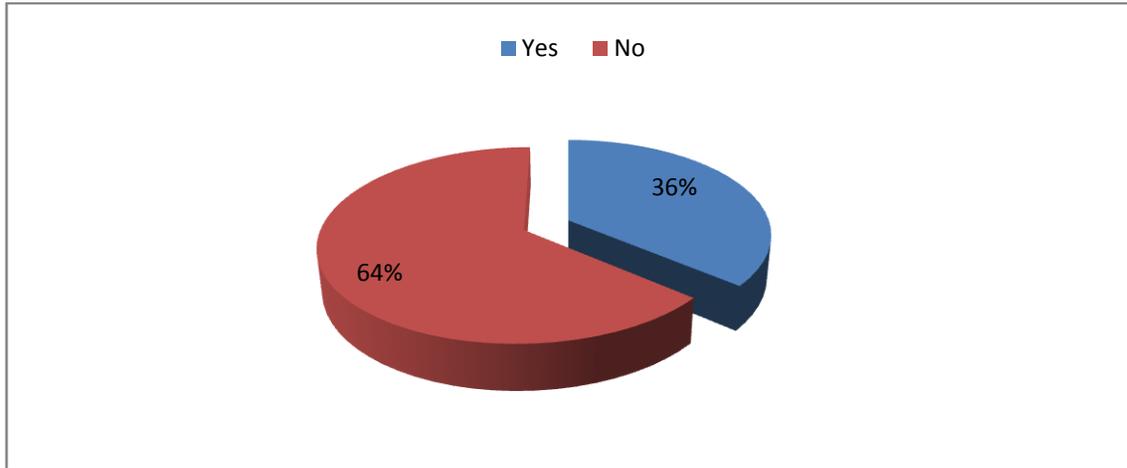
Table No.4.10
Methods of Information Regarding on Disaster

Sl.no	Information regarding disaster	Male	Female	Total Respondents	Male%	Female%	Total Percentage
1	TV	18	16	34	18	16	34
2	Radio	2	3	5	2	3	5
3	newspapers	11	11	22	11	11	22
4	Internet	19	16	35	19	16	35
5	Any other	3	1	4	3	1	4
6	Total	53	47	100	53	47	100

Source: Field Work, 13 to 24 October 2016

In the above table gives the information regarding the methods of mitigation about disaster. Around 35 percent of the respondents use internet as the source of information, 34 percent of the respondents form watching TV, 22 percent of the respondent through newspapers, 5 percent of the respondent were listening radio and 4 percent of the respondents awareness campaign. The information is most important factor on mitigation during disaster and the maximum number of the respondents knows the information during disaster through internet, TV and radio.

Figure No.4.10
Skill Trainings and Workshops on Disaster



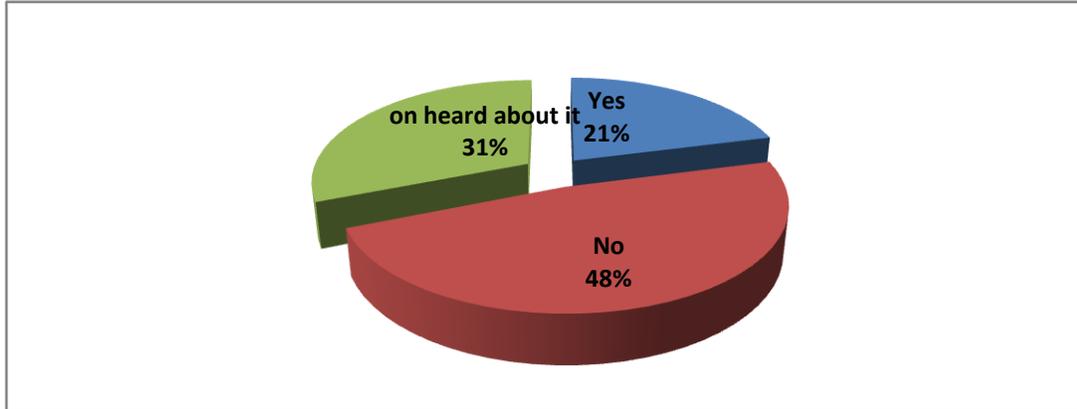
Source: Field Work, 13 to 24 October 2016

The above figure gives us the details of the skills training and workshops on disaster is been given or giving to the people. Maximum number of the respondent disagrees about skill training and workshop on disaster has been given to them. Around 64 percent of the respondents disagree and 36 percent of the respondents have a skill training and workshop. These 36 percent of the people who have skills training are willing to give training to the other people.

Preparedness

In order to know the people's view on preparedness on their locality, a close ended question was posed to the respondents about disaster management plans and organization and agency working on disaster management plans.

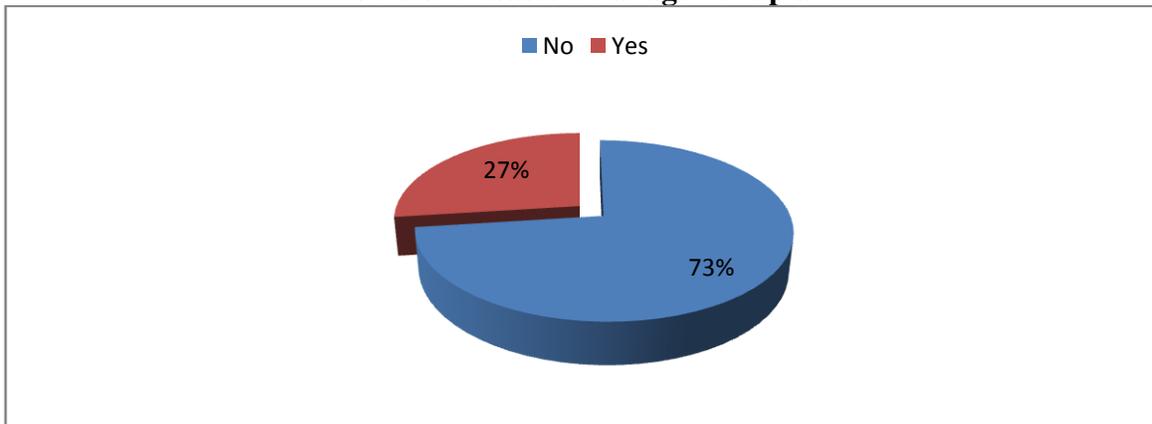
**Figure No.4.11
Disaster Management Plan**



Source: Field Work, 13 to 24 October 2016

Around the 48 percent of the respondent have no disaster management plan, 21 percent of the respondent have disaster management plans and 31 percent heard about it. Only 21 percent of the respondents were government employed who involved during disaster, also local leaders, and well knowledge about disaster management plans, also knowledge about term mitigation, preparedness, responses and recovery. The main cause of this irregularity is that most of them don't want to learn or questions the authority of the government and most of them blame government for not undertaking this issue in terms of disaster is concern.

**Figure No.4.12
Works on Disaster Management plan**



Source: Field Work, 13 to 24 October 2016

Above figure shows organization and agency working on disaster management. Around 73 percent of the respondents disagree on organization and agency working on disaster management plan and 27 percent of the respondent agrees. Most of the cause regarding of the disagreement is that most of them don't have any knowledge about it or ill informed about it. It is to be known that Pantok (Mangan) are working on disaster management plan in their locality and even the Panchayats are working on disaster management plans. Every village Panchayats have the district disaster management committee members who are working for the disaster management plan for people.

Response

During the time of disaster response is the main thing that helps to reduce casualties. In order to know the people view response on their locality, a close ended question was posed to the respondents to understand the immediate rescue, relief facilities during disaster, to get immediate relief and supply of funds.

**Table No.4.11
The Agencies in the Wake of Disaster**

Sl.No	Wake of disaster	Male	Female	Total	Male	Female	Percentage
1	Police and army	17	15	32	17	15	32
2	Local leaders	21	21	42	21	21	42
3	Member of NGOs	11	8	19	11	8	19
4	Other	4	3	7	4	3	7
5	Total	53	47	100	53	47	100

Source: Field Work, 13 to 24 October 2016

The relief and rescue is the most vital element in times of emergency. The above table shows agencies that come for rescue in the wake of the disaster. The agencies have been divided into police and army, local leaders, member of the NGOs, other like NDRF, SDRF and local community members. Around 42 percent of the respondents are local leaders, 32 percent of the respondent police and army, 19 percent of the respondent member of NOGs and 7 percent of the respondent other. According to the views of Mr.

Tashi Lepcha, the 2011 earthquake, most of the places were damaged by earthquake and landslide, so most of the roads and bridges are destroyed by earthquake and landslide. Most of the people and transportation are blocked by landslide and most of the places are out of electricity, mobile network. During this emergency situation local community had played the most important role during the disaster. Another immediate response have been given by SDRF in time of disaster says Mr.G.P Limboo.

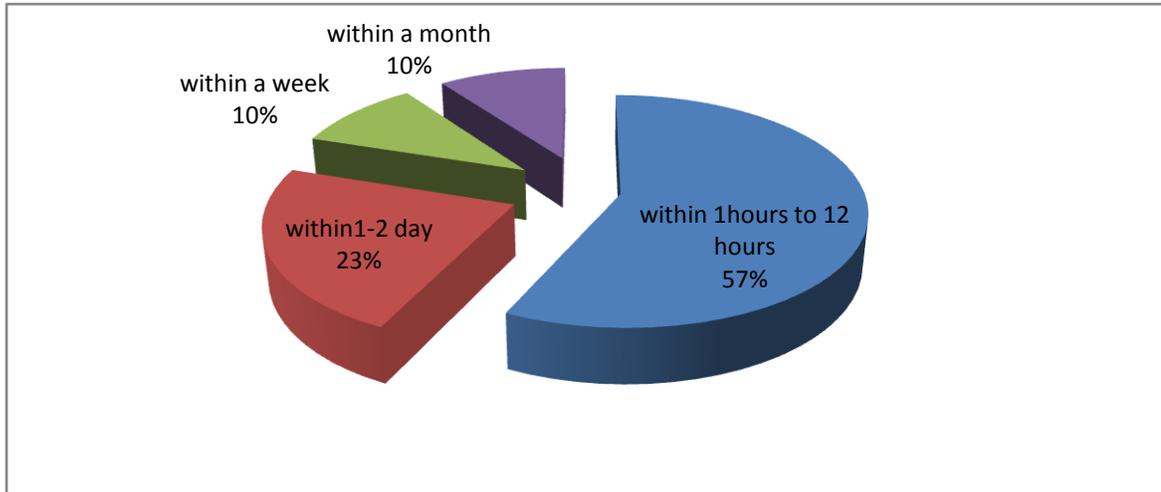
**Table No.4.12
Relief Facilities Offered During Disaster**

Sl.no	Relief facilities	Male	Female	Total	Male %	Female %	Percentage %
1	Food	15	10	25	15	10	25
2	Shelter	13	9	22	13	9	22
3	cloths	11	8	19	11	8	19
4	Medical care	12	17	29	12	17	29
5	Any other	2	3	5	2	3	5
6	Total	53	47	100	53	47	100

Source: Field Work, 13 to 24 October 2016.

During the disaster, relief facilities are important to save life of people, basics facilities of relief are food, shelter, cloths and medical care. Above table shows, maximum numbers of the respondent aiding the relief facilities. The above table shows the respondents were aided during the time of disaster around 29 percent of the respondents have received medical care, 25 percent of the respondents food, 22 percent shelter, 19 percent cloths and only 5 percent other which indicates transportation facilities. As transportation is the major instrument in times of disaster occurrence.

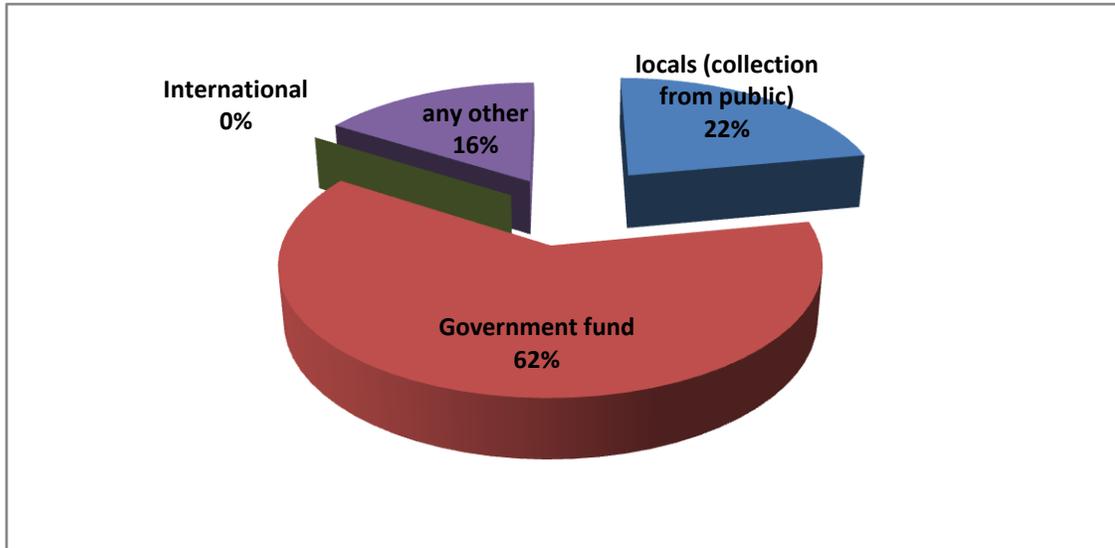
Figure No.4.13
Immediate Relief



Source: Field Work, 13 to 24 October 2016

Above figure shows the time frame of immediate relief during the disaster. Around 57 percent of the respondents got relief within 1 hour to 12 hours, 23 percent within 1 to 2 days, and 10 percent within a week and within a month. Most of the areas got are immediate get relief within 1 to 12 hours. In case of major disaster immediate relief were reached within a week and month. This case is found mostly in the rainy session which causes landslide which causes damaged to road, hail storm damages crops etc. In past 2011 earthquake most of the area got immediate relief within 1 to 12 hour, but some areas it took 1 to 2 days or weeks due to road damage and in case of Sikkim most of areas are connected by roads only.

Figure No.4.14
Supply of Funds during Disaster Management



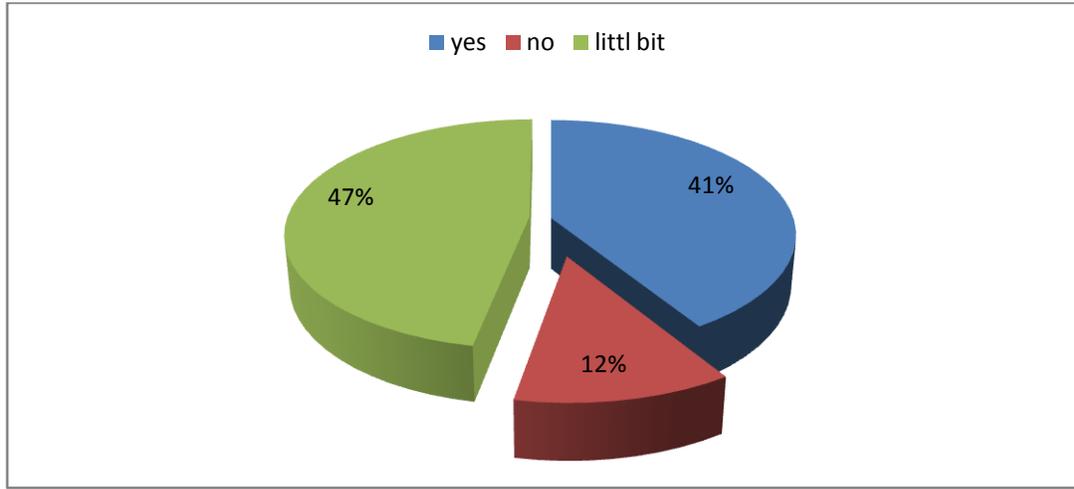
Source: Field Work, 13 to 24 October 2016

Above figure shows supply of fund during the disaster management. Around 62 percent of the respondent got from government's funds, 22 percent local's collection from public and 16 percent of form other sources. There is no sign of international funding in Sikkim during the time of disaster. In case of study area maximum number of funds is given by the state government which has been enough for the relief for the people.

Recovery

The recovery is one of the vital elements in tackling the post disaster management. In order to know the people's view on recovery and what lesson they learned from the post disaster. As mentioned earlier the most of the casualties was caused by the types of the houses so this section gives the information about the people's transforming their houses or not.

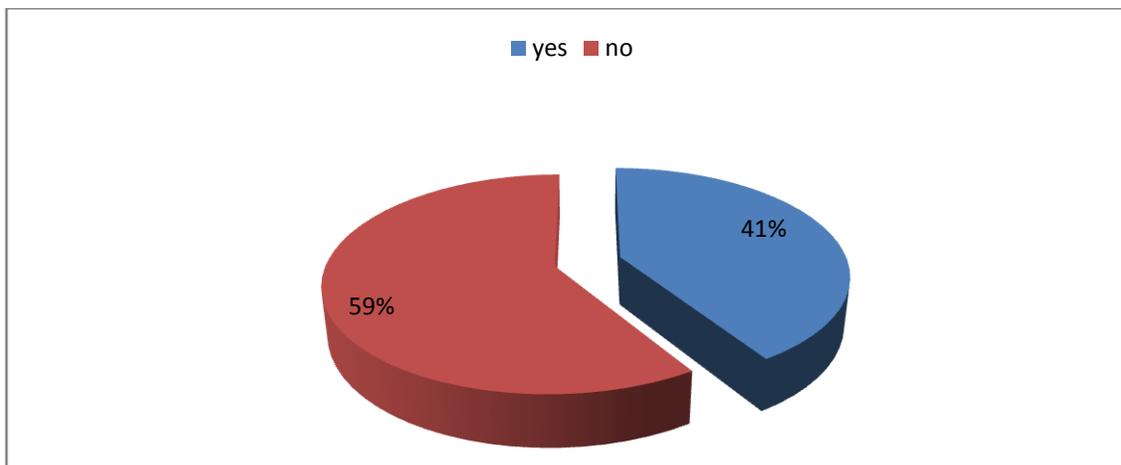
Figure No.4.15
Disaster Resistant Home



Source: Field Work, 13 to 24 October 2016

Above figure shows disaster resistant home on study areas. Home is most important indicator during the disaster or after disaster it shows the results of past disaster and how people got lesson from disaster. Around 47 percent of respondent agrees that little bit transformation have been made in their homes, 41 percent agrees that they have totally transformed it and only 12 percent haven't done till date. In Mangan people agreed that they have constructed earthquake resistant home in their locality.

Figure No.4.16
Improvement in the Basic Facilities, After Post-Disaster Management



Source: Field Work, 13 to 24 October 2016

Above diagram shows that maximum number of respondents understanding that there has been made certain improvement in the basic facilities. Around 59 per cent of the respondents disagree in the fact of improvements in the facilities and 41 per cent agree about the change. In view of respondent little bit of improvement has been made in terms of roads construction and houses. As there are mostly places where roads were not linked with the highway and even there were cases where there were no roads at all. But there were cases where roads were been constructed with major improvement. The Government even has implemented plans like Reconstruction of Earthquake Damaged Rural House (REDRH), and working on the landslide affected areas.

4.3 The Schemes and Programmes of Recovery from Disaster

The government has done and is doing many works in terms of disaster management. But most cases they have failed due to the geographical areas and in some cases due to the cultural heritage of the locals. Most of the respondents have agreed that the centre and state governments are working for disaster and their management. In case of disaster management plans, government is providing awareness programmes at school and first aid awareness programmes.

Some respondent agrees that reconstruction of house schemes has provided in their locality. Most of respondent agreed that houses are under construction in their locality. Not only have the construction financial aid also been given to the needy or the people who have been affected by the disaster with new drinking water connection in their locality. The case of Mr. Dawkit Bhutia, government employed, she says during 2011 earthquake, in their locality government provided financial supported sum of Rs 15000 to 20000 has been distributed local people.

The relief facilities provided by their department like Land Revenue and Disaster Management, during disaster are Ex-gratia as per NDRF norms. The other department is provided fund, cloths, water and foods and fund are collected from employed. The Department of Land Revenue And Disaster Management working on disaster, department provided skill training are training on first aid, search or rescue, training on disaster

management plan preparation and school safety. The department of fire, in school level training programmes is also conducted in different schools in North Sikkim.

4.4 Respondent Views on Disaster Management

Management is one of those ingredients to which a disaster can be tackled. In the case of the study areas most of the respondent agreed that awareness programmer, demonstration, workshops, mock drill, plantation and training is important to improve on disaster management plans. Some respondent have offered rescue items like a GUP level and basics facilities for disaster management like Japan form the state government for disaster management. This led to the awareness of disaster management skill or training among the masses. If local people are properly trained, rescue mission are more easily to find out affected person during disaster. Proper planning and facilities have to be provided to each and every village, time to time awareness programmes or counseling should be conduct by the concern department.

4.5 Government Officials understanding on Disaster

The views of the government officials are different when disasters occur in Sikkim i.e. landslide, earthquake, flashflood and forest fire etc. During the rainy season landslides and flash floods major disaster in district and also huge affected of life of people. During heavy rain cause landslides an also affected transportation and communication. Disaster is directly or indirectly affected of people in North District. People lost due disaster the major damaged made by disaster are Property damaged, house, agriculture land crops damaged infrastructure loss of human animals.

4.6 NGOs Response on Disaster

The civil society and NGOs are important to society. As these civil societies can reached directly to the people and can work form the grass root level for the disaster management among the regions. The scenarios in North Sikkim NGOs are working under disaster but they are not totally involved on disaster management, but the support victims by giving them counseling about disaster and even working for the people affected form trauma created by disaster.

Table No. 4.13

List of NGOs

Name of NGOs	Place
Social Culture & Environment	Dzongu
Northern Club	Mangan
Nari Samaja	Mangshila
Social Welfare Association	Mangshila
Wingdi Faith Mission	Mangan
NYKS	Mangan
Mangshila United Sports and Culture Association	Mangshila

Source: Field Work, 13 October to 24 October 2016.

In study area there are seven NGOs and also every village society (self help groups) working on disaster management plans. There are three NGOs that are working for disaster which is Mangshila United Sports and Culture Association located in Mangshila, Wingdi Faith Mission located in Mangan and Nari Samaja located in Mangshila. Most of the NGOs working on disaster are earthquake, landslides and fire. The organization's activities in the year 2011 earthquake and recent landslides (Dzongu) are major work on disaster. During the disaster they provide relief items like foods, clothes and shelter to the victims. The fund is also collected from people for the relief. Though they are engrossed in the grass roots level but they are hardly supported by the governments.

Conclusion

Sikkim is one of the most prone areas in terms of natural disaster. The major disasters in Sikkim are earthquake, landslide and flashfloods etc. The most dangerous natural disaster occurred in Sikkim was the earthquake of 2011 which took many lives as well as wealth in the state. The earthquake of 2011 mostly affected all the four district of Sikkim but most dangerous effects of this disaster was felt in the northern region of Sikkim. This led to numerous problems as the roads were all blocked the relief team had to face many problems due to the road blockade. The recent natural disaster occurred in North Sikkim was the landslides near the village of Mantam caused by huge landslides which formed a lake which became serious concern as this led to the submerge of the village under water. The village of Tingvong, Lingdem, Laven, Langzay, Bay, Sakyong

Pentong and Ruklu Kayeem were all damaged and the connection of the roads were all cut off leading to serious damage to the people as well as to their assets.

In case of North Sikkim, landslides, flashfloods, forest fire and earthquake major disasters. Earthquake and landslides is most frequently disaster in study area. During rainy session landslides affect the life of people in North Sikkim, landslides affect directly or indirectly affect on north Sikkim. Directly affect transportation, properties, drainage systems and cut off electricity and indirectly affect economy of people, damaged crops, affect of their income (tourism sector), in case of business. There is lack of mitigation programmes on study area. The local government and NGOs are mostly involved in workshops and skill training at local level. The government is also providing awareness programmes at school and first aid awareness programmes in all the four districts in Sikkim. But due to the lack of people's participation in these workshops has created many problems during and after disaster. There is need to developed or set up information center in every village.

In most cases the relief and rescue operations are not working immediately due to lack of communication and transport network. As in study area most of the places are linked only by roads which are a serious concern during disaster. As there is Reconstruction of Earthquake Damaged Rural House (REDRH), which has been implemented in Sikkim but still houses are constructed on the prone areas in study area which is not linked with the main roads. The most important issues are that most of the houses in the study areas don't have proper roads where relief could reach during disaster. These issues were seen during the 2011 earthquake and 2016 landslide in Sikkim especially North Sikkim where lack of proper roads led to immense loss of life and property. There are still room for improvement in terms of preparedness, mitigation and prevention in Sikkim.

CHAPTER-5

CONCLUSION

Natural disasters such as earthquakes, tsunamis, and floods can often come at the least expected time. The other disasters such as hurricanes and cyclones are increasing in severity and destruction. These are the undeniable fact that led to the study, as the main objective of this study is to analyse the Nature and Scope of Governance and Management in Disaster. It also made an attempt to examine the Policies and Programmes of Disaster Management in India and Sikkim. The one of the most immediate and spontaneous relief aid that comes to the people during disaster is Government which manages the risks and helps in overcoming the situation of the people. This study was carried in North Sikkim one of the most vulnerable area in Sikkim as well as India with governance and disaster managements as the core of the study.

The discussion on Chapter II has made an attempt to bring out various perspectives on governance and disaster management to understand its role and effectiveness. The governance as a subject is the one of the main and immediate actor that aids the people during any disasters occurrence. Governance is complicated by the fact that it involves multiple actors, not single entity. The UNDP defines governance as the actors who exercises economic, political, and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes, and institutions through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations, and mediate their differences. Governance is a new concept in the study of disaster. The governance is a capacity of societies to guide and organize their public and social institutions so that they can provide the people with more and better opportunities for living. In terms of governance there is need for intuitional systems and administrative arrangement that links public, private and civil society which build relations between local, national and global actors. Good governance has also been described as the striving for rule of law, transparency, responsiveness, participation equity, effectiveness and efficiency, accountability and strategic vision in the exercise of political, economic and administrative authority. Good laws and legal framework are essential to reduce the risk the disaster. Good legislation has the power to help

communities become less vulnerable to strengthen their ability to deal with the hazards they face and to smooth the path of rescue services, humanitarian aid and recovery help when they are needed. As one of the major areas to which governance had worked properly is the recovery method. In effect, many countries have used the recovery context to implement, reform, or improve their institutional and legislative arrangements for disaster risk reduction. Several internationally relevant gatherings have identified primary governance issues in the context of disaster risk reduction and post-disaster recovery. The World Conference on Disaster Reduction in 2005, Global Assessment Report on Disaster Risk Reduction 2009, and the Incheon Declaration 2009 are among the many examples.

Good governance is characterized by the principles of sustainability, subsidiary, equity, efficiency, transparency and accountability, civic engagement and citizenship, and security. These principles, which are advocated by UN-HABITAT, are interdependent. As to add upon the characteristics of it disaster management is one of the major tools to which this governance can function. In fact as observed from this study, natural disasters exacerbate the already existent societal, economic, political, developmental, environment crises that continuously plague these countries. Thus, as clear from this study a disaster management plan needs to be all comprehensive entailing a multi disciplinary approach that would require effective coordination among scientist, engineers, policy makers, planners and administrators. This also requires effective coordination among the governmental agencies, the non governmental agencies, international relief organization and the local communities. The most essential part to prevent disaster at the bud is the participation of the local people because they are the ones who are the victims of the disaster.

A comprehensive disaster management strategy based on the concept of disaster cycle involves broadly four stages of activities pre disaster activities that involve mitigation and preparedness and post activities response and recovery. However, none of the stages of the disaster cycle can be compartmentalized and treated as exclusive categories due to their definite functional overlapping, the increasing focus by academicians, policy makers, planners and other involved in the field on pre disaster activities and more specifically disaster preparedness. These disaster management

strategies cannot be overlooked as these are the main agencies which prepare the people for prevention and management during pre and post disaster. It is the key elements for preventing disaster.

The disaster management is one of the key instrument for tackling disaster but one of the most important agencies or instruments are policies and programmes for disaster prevention. This policies and programmes are one of most important keys when dealing with the governance. So, Chapter III specifically highlights different policies and programmes of Disaster Management in India and also Sikkim. India is the country which is mostly affected by disaster because of its geo climatic conditions. Natural disaster hits large number of people every year in India that results in huge loss of lives and properties. In India disaster especially the coastal states particularly in the east coast and Gujarat, are vulnerable to cyclones and floods. It has been shown that around 68 percent of net snow area is vulnerable to drought, 55 percent of total area is seismic zones IV-V and vulnerable to earthquake to Himalayan regions. The Western Ghat is very much vulnerable to landslides. The one of the most unforgettable disaster that occurred India are Latur earthquake in 1993 and Orissa super cyclone in 1999 had set up a high powered committee in 1999 and a National Committee on Disaster Management after Bhuj earthquake of 2001 and Indian Ocean tsunami in 2004 acted new chapter in Disaster Management Plans. The history of disaster management in India in central scheme of natural disaster management programmes has been implemented since 1993 -1994 by Department of Agriculture and Co-operation with the objectives to focus on disaster preparedness with emphasis on mitigation and preparedness.

In 2003 the Department of Agriculture was given role of disaster management in India. The Government of India took a defining step in legislative history of country by enacting Disaster Management Act in 2005 under Ministry of Home Affairs Government of India. The Disaster Management Act established a three pronged institution structure at National, State and District level. Government of India has established National Disaster Management Authority (NDMA) and States have State Disaster Management Authority (SDMA) and District Disaster Management Authority (DDMA) at district level, the level of preparedness is far below desired level. The Government of India has

raised specialized National Disaster Response Force (NDRF) and the States are raising State Disaster Response Force. Other emergency service providers like the Police, fire services, civil defense and emergency medical and trauma care services have been improved and capacities of local communities as first responders enhanced through community based disaster preparedness programmes. In order to build a safe and disaster resilient, India developed a cultural of prevention, mitigation, preparedness and response, National Policy on Disaster Management was framed by National Disaster Management Authority and approved by the Union Cabinet on 22nd October, 2009 under the Ministry of Home Affairs, Government of India.

The Government of India has adopted mitigation and prevention as the essential components of its developmental strategy. The Tenth Five Year Plan emphasizes the fact that development cannot be sustained without mitigation built into development process. In brief disaster management is being institutionalized into development planning. But there are various underlying problems in the whole process. In India there has been a demand in initiatives in managing the impact natural disaster. The UNDA with Government of India has jointly prepared an action plan for cities and towns vulnerable to earthquakes. The need in the vulnerable zones is that the existing buildings be technically assessed and evaluated and individual owners and group housing authorities should be informed about the weaknesses in their construction. Presently, in India, it is estimated that around 10 lakh buildings which are constructed every year, an equal number of them get damaged as a result of disasters. It is required that a monitoring mechanism should be set up in disaster prone areas and it must act in proper coordination with the concerned to ensure fulfillment of building codes. The role of administration does not end with end of disasters. In fact its effort and commitment get more complex. It requires proper coordination among various agencies. In this context it is very important to note that disasters are non-routine events that require non-routine response with more strong and flexible policies and programmes.

In order to understand governance and disaster management Chapter IV has examined the issues and concern of governance and disaster management in Sikkim. The main focus has been made to Sikkim especially North District which is prone to disaster

every year. This study's main objective is to understand the perception of people during pre and post disaster period in Sikkim. In Sikkim the natural disaster occurs are landslides, earthquake, flash flood, high speed wind, drought, forest fire and hail storm. Sikkim lies under seismic zone IV and V, which is known as a very high risk zone. North Sikkim is one of the most vulnerable in terms of disaster which is also the largest district of Sikkim. In Sikkim Disaster Management Plan was established on Disaster Management ACT 2005 and Sikkim Land Revenue and Disaster Management Department are working on Disaster reduction. The District wise disaster management plans are also working. State Disaster Management of Sikkim, Department provides schemes and programmes for Recovery Reconstruction Damaged Earthquake Rural House (RDERH). This Department also works on landslides mitigation plans on State, District and local level. Department working on health camps in rural areas, and awareness programmer on disaster, first aid training, and rescue training programmer on fire and school safety have been conducted.

During the earthquake of 18th September 2011, the communities responded well but were not skilled in dealing with the situation. This under skill is one the most challenging issue in Sikkim. As most of the people are not aware of the information and most of them are ill informed about disaster management and its prevention. The army and paramilitary force which were in situ helped in rescue and immediate relief. One of the most challenging issues for Sikkim especially in North Sikkim is the transportation, as most of them were only linked with roads which are sometimes blocked due to landslide. Most of the parts in North Sikkim are that some of the places are not connected with the national highway because most of them don't have proper road facilities. This issue has been one of the most negative impacts during the time of emergency in North Sikkim. They have to now look inward to see if they are well-equipped to manage disasters, and if their infrastructure is safe enough to sustain the seismic shocks in Zone IV and V areas. The NDRF response in Sikkim was quick but it was delayed due to landslides and bad weather. They have to ensure that appropriate transport is available to enable them to reach the disaster site at the earliest. The state now faces the task of not only rehabilitating the affected people and providing shelters, but to make this an opportunity to build better infrastructure and make Sikkim disaster resilient.

Findings of the Study

- In the wake of globalization and speedy growth trajectory to benefit development for all, casualties of Disasters (man-made/ natural) are increasing day by day and there is a growing effort to reduce its impact at International, National and local level by exploring the scope of governance in Disaster management.
- Spillover effects of global initiatives on Disaster Management policies are reflected at national and local level institutional arrangements. In this regard, a national disaster authority encourages people, civil societies and national institutions to follow a path of sustainable development and penalize the offences relating to disasters.
- Better management practices and governance of casualties can reduce the impact of disasters.
- When disasters occur administrative measures are inadequate to meet urgent needs and expectations of the victim.
- Disaster resistant infrastructures such Houses, Roads, Hospitals and the availability and smooth functioning of ICT enabled technologies are keys to mitigate the future disasters like earthquake and landslides.
- Lack of proper awareness and skill training programmes in society has lead to maximum number of casualties in India and Sikkim. The training institutions in block and district level needs to be made for preparedness during disaster.
- To improve awareness programmes demonstration, workshop, mock drill, plantation and training in local level is necessity.
- Lack of finance one of the major issue in North Sikkim which is one of the most serious concerns during the time of disaster.
- There is need of counseling centers in Sikkim as overwhelming majority of deaths immediately after a natural disaster is directly associated with blunt trauma, crush-related injuries and burn injuries.
- The elderly and children receive less concern during the time of emergency which needs to change. The communities should ensure that these populations receive the assistance they need.

- Most of the people in Sikkim are resided in the landslide areas.
- Transportation is the major concern in the study area as most of them don't have proper road facilities.
- Government, private sector and civil societies need to co-operate each other in terms of disaster management plans.

The study reveals that most of the people in the study area are educated but still there are many problems during the times of emergencies. As the most pertinent reasons for this is that a proper training or preparedness is lacking. So in order to tackle this situation number of training and counseling programmes in terms of disaster occurrence has to be given to the people so that there will be less casualties. For this disaster management committees need to be there at each district and also at divisional and village levels. And also the government and the civil societies should work together for disaster preparedness and to mitigate.

Further studies can also be conducted towards disaster as it is a vast issue which is very much interdependent with many factors so issues can be looked like manmade disaster, natural disaster and the reasons leading towards it. The other issues look upon are the drawbacks of the government in disaster management and governance as most of the governmental programmes, schemes policies in terms of disaster are not properly implemented in Sikkim so more studies can be carried out to find out the reasons and also need to focus on mitigations plan in Sikkim and local level of disaster management plans through a Panchayati Raj.

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APPENDIX I
Questionnaire

- Name _____
 - Sex:
Male () Female ()
 - Age:
10 to 20 () 21 to 40 () 41 to 60 () Above 60 ()
 - Qualifications:
I to X () XI to XII () BA () Above BA () Diploma ()
 - Occupation:
Student () Government Employed () Private Employed () Local Leaders ()
Business () Other ()
 - House type:
Pakka house () Kaccha house ()
 - Available facilities within 5 km:
Hospital () Health Center () Police Station () Fire Station () School ()
Panchayats House () ICDS () Community hall ()
1. What kind of Disaster may occur or occurred in your place?
 - a) Earthquake_____
 - b) Landslide_____
 - c) Floods_____
 - d) Fire_____
 - e) Other specify_____
 2. Did anyone of your family members lost their lives due to Disaster?
 - a. If yes, how many? _____
 - b. No _____
 3. What are the kinds of damages caused by Disaster?
 - a. Land _____
 - b. Livestock_____
 - c. Agriculture_____
 - d. House_____
 - e. Any other_____
 4. Which are the agencies come for rescue in the wake of Disaster?
 - a) Police and Army_____
 - b) Local leaders_____

- c) Member of NGOs ____ d) Other_____
5. What is the relief facilities offered during Disaster?
 a) Food_____ d) Medical care_____
 b) Shelter_____ e) Any other_____
 c) Cloths_____
6. Have you received any skill trainings and workshops on Disaster?
 If yes mention it_____
- No_____
7. Which of the following is the most effective way to communicate information regarding Disaster?
 a. TV_____ d. Internet_____
 b. Radio_____ e. Any others_____
 c. Newspapers _____
8. Do the community in your area has Disaster Management plan?
 a. If Yes, mention_____
- b. No_____
- c. Only heard about it_____
9. Does any organization/agency is working for the Disaster Management plan in your locality?
 a. No_____
- b. If yes, mention_____
10. How much time does it take to get immediate relief?
 a. Within 1 hours to 12 hours_____
- b. Within 1-2 day_____
- c. Within a week_____
- d. Within a month_____
- e. Other_____
11. Who supply funds to your locality during Disaster Management?

- a. Locals (collection from public)_____
 - b. Government_____
 - c. International organization(s)_____
- Any other_____

12. Are you aware how to make your home Disaster resistant?

- a. Yes _____
- b. No_____
- c. Little bit_____

13. Is there any improvement in the basic facilities, after Post-Disaster Management?

- a. If yes, mention _____
- b. No _____

14. What are the schemes and programmer offered by the governments (state/center) for the recovery from Disaster?

15. How Disaster Management can be improved from your experiences?

APPENDIX II
Questionnaire Government Officials

1. Name _____

2. Designation: _____

3. Department: _____

4. What kind of Disasters occurs in Sikkim?

5. What are the kinds of damages caused by Disaster?

6. What are the relief facilities your Departments provide during Disaster?

7. Do you provide any skill training programmes and working on Disaster Management?

8. What are the schemes and programmes your department initiate to deal with Disaster in Sikkim?

APPENDIX III
Questionnaire for NGOs

1. Name _____
2. Organization _____
3. Address _____
4. Is your organization working on Disaster management?
 - a) Yes
 - b) NoIf yes specify _____
5. Activities on Disaster Management?
 - a. knowledge _____
 - b. Year _____
 - c. Fund _____
 - d. Other specify _____
6. How Government support the organization to carry out your activities during Disaster Management?

7. How do the organization involve during the rescue operation and rehabilitation?
 - a. Directly involved _____
 - b. Indirectly involved _____
8. Do you have any suggestion and recommendation to better Disaster Management in Sikkim?

