

***A STUDY OF THE LINKAGES BETWEEN  
NATURAL DISASTER MANAGEMENT AND SUSTAINABLE DEVELOPMENT IN  
BANGLADESH AND INDIA (1995-2010): A HUMAN SECURITY PERSPECTIVE***

***THESIS SUBMITTED TO  
JADAVPUR UNIVERSITY  
FOR THE AWARD OF THE DEGREE OF  
DOCTOR OF PHILOSOPHY (ARTS)***

***SUBMITTED BY  
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**Certified that the Thesis entitled**

**A STUDY OF THE LINKAGES BETWEEN NATURAL DISASTER MANAGEMENT AND SUSTAINABLE DEVELOPMENT IN BANGLADESH AND INDIA (1995-2010): A HUMAN SECURITY PERSPECTIVE submitted by me for the for the Degree of Doctor of Philosophy in (Arts) at Jadavpur University, Kolkata is based on my own work carried out under the Supervision of Professor (Dr) Sumita Sen, Department of International Relations, Jadavpur University, Kolkata.**

**And that neither this thesis nor any part of it has been submitted before for any degree or diploma anywhere/elsewhere.**

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*“Clouds come floating into my life,  
No longer to carry rain or usher storm,  
But to add color to my sunset sky”*

*[Stray Birds: Verse: 292: By: Rabindranath Tagore, 1916]*

## *CHAPTER I*

### *INTRODUCTION*

#### *Understanding the Linkages between Natural Disaster,*

#### *Sustainable Development and Human Security*

Disaster is the one of the prime threats to human security. Disasters<sup>1</sup> traditionally have been understood as “natural” or acts of God. The changing disaster scenario has brought change in perception of natural hazards and disasters to take into consideration disaster causing agents particularly actions of man transforming hazards into disasters. When disaster strikes two things comes to the immediate reckoning, first is the issue of human security and second is the issue of sustainable development. Disaster events are multi dimensional in nature causing serious disruptions in socio-economic and political life of the people. The risks associated with disasters have become one of increasingly global concern as the impact associated with disaster has a spillover effect on the development process.

Disasters result from the interaction of a community and its environment with natural hazards. Disasters are part of the natural environment and often subject of socio-economic and political concerns. The occurrences of major natural disasters in the recent past<sup>2</sup> makes it quite clear that natural disasters are quite difficult to predict but at the same time has far reaching consequences for security and well being of the individuals and communities concerned. The loss and damage from disaster may range from human sufferings and insecurities to the loss of developmental gains achieved so far. Disasters are causes of vulnerability of human existence. This implies that growth in number of disaster occurrences is related to increased exposure to vulnerability and therefore to be considered from a multidimensional angle.

## **Global Disaster Scenario: Trends and Impacts**

The intensity and frequency to natural disasters are increasing in recent years. The increased frequency and intensity of disaster events has been well documented and understood by most stakeholders across the world<sup>3</sup>. The 1970s, recorded approximately 69 cases of natural disasters and by 2000s, this figure had increased to 350 per year. At the same time the annual economic losses averaging approximately US\$ 12 billion per year in the 1970s have grown to approximately US\$ 88 billion per year since 2000<sup>4</sup>. The world recorded number of worst occurrences of natural disasters nearly 41% in Asia in the last decade<sup>5</sup>. Similarly out of the total number of deaths and affected people by disaster in the world, nearly 78% of deaths and 91% of affected people by disaster are from Asia<sup>6</sup>.

Disaster data indicates that it is the poor who face the greatest risk from disasters. At the world wide level 90% of the natural disasters and 95% of the total disaster deaths occur only in the developing countries compared to fewer than 2% of the global death occur in countries with high levels of development<sup>7</sup>. According to the “Annual Disaster Statistical Review Report 2012: Numbers and Trends” amongst the top 10 countries in terms of disaster mortality six countries are classified as low-income or lower-middle income economies and four as high-income or upper-middle income economies. These countries accounted for 68.2% of global reported disaster mortality in 2012<sup>8</sup>. The following Table 1.1 provides a clear picture of impact of natural disaster occurrences scenario by region in terms of people killed, affected and damages in US \$ dollar in the last five decades (1975-2011). The table shows that the highest number and percentage of people killed, affected and damages in US \$ dollars region wise has occurred in Asia compared to Africa followed by Americas, Europe and Oceania.

**Table 1.1: Impact of Natural Disasters by Region, 1975-2011**

Region	Impact							
	Occurrence		Killed		Affected		Damage (US\$ million)	
	(share in %)		(share in %)		(share in %)		(share in %)	
Africa	2,057	(19.6%)	728,621	(25.5%)	393,800,705	(6.5%)	27,308	(1.2%)
Americas	2,496	(23.8%)	418,484	(14.6%)	210,406,943	(3.5%)	757,763	(33.9%)
Asia	4,041	(38.6%)	1,521,599	(53.3%)	5,402,771,764	(89.0%)	1,086,756	(48.7%)
Europe	1,390	(13.3%)	182,721	(6.4%)	42,065,797	(0.7%)	306,022	(13.7%)
Oceania	489	(4.7%)	5,999	(0.2%)	20,552,254	(0.3%)	55,801	(2.5%)
<b>Total</b>	<b>10,473</b>	<b>(100.0%)</b>	<b>2,857,424</b>	<b>(100.0%)</b>	<b>6,069,597,463</b>	<b>(100.0%)</b>	<b>2,233,649</b>	<b>(100.0%)</b>

Source: Ref: EM-DAT: The OFDA/CRED International Disaster Database-www.emdat.be as presented in Asian Disaster Reduction Centre Data Book, Natural Disasters Data Book 2011[Accessed on 16May2015at 12.32 a.m.] p 9

The analysis of global disaster data shows that number of occurrences, mortality and economic loss has increased in 2011 compared to the last ten years (2001-2010) data record. The following Table 1.2 presents the global scenario of natural disaster occurrences, victims and economic loss during (2001-2011).

**Table 1.2 Impact of Natural Disaster by Type, Occurrences (in numbers), Victims (in millions) and Economic Loss in (US \$ Billion) globally for the period 2001-2011**

Disaster Type	Number Disaster		Victims in Millions		Economic Loss	
	2001-2010 Average	2011 Occurrences	2001-2010 Average (Million)	2011 Victims (Millions)	2001-2010 Average US \$ Billion	2011 Damages US \$ Billion
<i>Flood, Landslides (hydrological)</i>	195	173	139.77	108.70	21.09	70.72
<i>Cyclone, Storm (Metrological)</i>	105	84	38.52	39.10	54.77	50.87
<i>Drought, Heat-Cold (Climatological)</i>	50	39	77.23	64.60	9.10	14.23
<i>Earthquake, Volcano (Geo-Physical)</i>	35	36	8.92	1.76	24.08	230.30
<b>Total</b>	<b>385</b>	<b>332</b>	<b>264.44</b>	<b>214.16</b>	<b>109.04</b>	<b>366.12</b>

Source: Ref: South Asia Disaster Report 2011 SAARC Disaster Management Centre. New Delhi SDMC 2013 [Accessed on 28 March 2015 at 3.39 p.m.] p 3

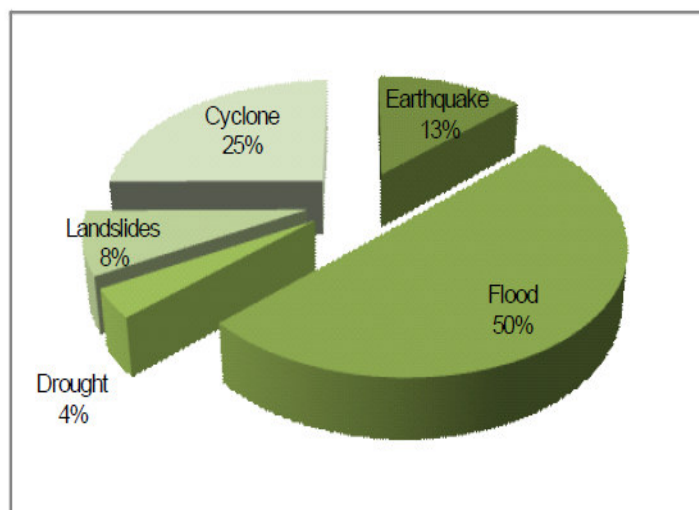
## **South Asian Disaster Scenario: Trends and Impacts**

South Asia as a region experiences every type of “multiple” natural disasters<sup>9</sup>. South Asia stands as one of the regions affected by highest number of natural disasters. Between the period of 1971-2009 South Asia has experienced 1,017 occurrences of natural disasters<sup>10</sup>. One also finds that the number of disasters per year has quadrupled over the past few decades resulting in huge economic losses<sup>11</sup>. The Indian Ocean Tsunami in 2004 accounted for 90% of the year’s death toll and affecting 2.4 million people. One can also find that in the same year 2004 almost 69 million people in Bangladesh and India were victims of natural disasters<sup>12</sup>.

The frequency of natural disasters has increased in South Asia. During the period between 2006 and 2008 South Asia recorded 128 natural disaster events out of these 93% were of hydro-meteorological origin, 86 incidences of flooding were reported, with nearly 8000 lives lost<sup>13</sup>. According to World Bank Report 2009 between 1990 and 2008, over 750 million were affected by a natural disaster, resulting in almost 230,000 deaths and about US\$ 45 billion in damages. The Report further states that the poor communities suffer the most from such hazards having a significant effect on livelihood, especially for communities depending on agriculture and poor managed economy that is further affected by these calamities<sup>14</sup>.

The Synthesis Report on South Asian Region Disaster Risks 2010 states that during the last four decades (1967-2006) out of total 784 reported disasters, 50% were floods, 25% cyclones, 13% earthquakes, 8% landslides and 4% drought (See Fig. 1.1). The total economic loss was US \$ 80 Billion with flood alone causing US \$ 49 Billion<sup>15</sup>.

**Figure 1.1 Percentage Distributions of Reported Disaster Types in South Asian Region (1967-2006)**



**Source:** Ref: *Synthesis Report on South Asian Region Disaster Risks – Final Report. South Asian Region Disaster Risk Management Programme Synthesis Report on SAR Countries Disaster Risks. World Bank: UNISDR [Accessed on 05 October, 2015 at 12.01 p.m.] p 18*

The analysis of disaster data for the South Asian region shows that number of occurrences, mortality and economic loss has increased in recent years (2000-2007). The following Table 1.3 presents the South Asian scenario of number of natural disaster occurrences, victims in millions and economic loss in US \$ Billion during (2000-2007).

**Table 1.3 Impact of Natural Disaster by Type, Occurrences (in numbers), Victims (in millions) and Economic Loss in (US \$ Billion) in South Asia for the period 2000-2007.**

Disaster	Number Disaster		Victims in Millions		Economic Loss	
	2000-2006 Average	2007 Occurrences	2000-2006 Average (Million)	2007 Victims (Millions)	2000-2006 Average US \$ Billion	2007 Damages US \$ Billion
<i>Flood, Landslides (hydrological)</i>	191	229	95.60	117.90	18517	24517
<i>Cyclone, Storm (Meteorological)</i>	107	105	41.18	23.98	53865	29558
<i>Drought, Heat-Cold Wave (Climatological)</i>	57	54	8.90	8.06	10495	4597
<i>Earthquake, Volcano (Geo-Physical)</i>	39	26	4.60	1.20	7514	16312
<b>Total</b>	<b>394</b>	<b>414</b>	<b>234</b>	<b>211</b>	<b>90391</b>	<b>74985</b>

**Source:** Ref: *South Asia Disaster Report 2007 Disaster Management Centre. New Delhi SDMC 2008 [Accessed on 28 March, 2015 at 3.39 pm]*



### ***Disaster Scenario: Bangladesh and India***

Disaster data from India and Bangladesh also indicates that both the countries are most vulnerable and disaster prone countries in South Asia. Among all the South Asian countries Bangladesh and India is highly vulnerable to two types of disasters namely flood and cyclone affecting the largest number of population and contributing to significant economic losses<sup>16</sup>.

India is highly vulnerable to multiple disasters. The India Disasters Report of 2000 indicates that there exist mainly two types of natural disasters- floods and cyclones which are most vulnerable in case of India<sup>17</sup>. India ranks third in the number of disaster events, second in number of disaster victims and fifth in economic damage due to natural disasters with annual loss to disasters is estimated to close to 2% of Gross Domestic Product (GDP)<sup>18</sup>. The average annual loss of lives due to natural disasters in India is around 4500 and over 1.5 million hectare of crops destroyed every year<sup>19</sup>. Bangladesh faces at least one major disaster a year. Bangladesh has been ranked as the number one nation at risk for tropical cyclone and number six for floods<sup>20</sup>. It lost on an average of 3.02 percent of its GDP every year during the last 10 years and holds the highest mortality rate<sup>21</sup>. During 1990-2008 the annual loss was of US\$ 2,189 million (1.8% of annual GDP) from disasters and the average annual death toll was 8241 (6.27 %) per one hundred thousand inhabitants<sup>22</sup>.

### ***Disaster and Climate Change***

Climate change is now adding significant additional risks to disaster situations in South Asia. The Inter-Governmental Panel on Climate Change confirmed in its Fourth Assessment Report (IPCC 2007) that geographic distribution, frequency and intensity of regular hazards (tropical storms, floods and droughts) have already significantly increased as a result of climate change<sup>23</sup>.

The change in the climatic system may probably exacerbate some of the events normally categorized as “natural disasters” (weather related events) and magnify their effects. It has been estimated that climate change is annually displacing 25-30 million people globally. By 2015 about 375 million people may be affected by climate related disasters and as many as 200 million people may be on the move each year by 2050 because of hunger, environmental degradation and loss of land. Moreover in the last decade about forty percent of all casualties related to natural disasters were found in the poorest countries<sup>24</sup>.

The Fifth IPCC Assessment Report on South Asia 2014 has further identified a set of key climate related risks for Asia including South Asia<sup>25</sup>. The estimated (2 degree) rise in temperature will be highly vulnerable for South Asia’s coastal settlement including India and Bangladesh. This indicates a greater risk for security of the people and development of the region. The heavily populated mega-delta (Ganga-Brahmaputra-Meghna) regions will be at greatest risk due to increased flooding. The changes in the coastal deltas will potentially displace millions of people. South Asia has a long and densely populated coastline with low-lying islands (the Maldives, Sri Lanka and Bangladesh) that are vulnerable to sea level rise. Having a coastline of 12,000 kilometers and a number of islands, the region is highly vulnerable to cyclones, storm surges, tsunamis and sea level rise<sup>26</sup>.

The recently-concluded COP21 (Conference of Parties) has, once again, reignited the debate over climate change negotiations. For the first time in twenty years of UN negotiations, the aim was to achieve a universal agreement on climate change. The main objective of the Paris climate change conference was to achieve – firstly, legally binding provisions aiming to keep global warming below 2°C target and secondly, extracting commitments from each country for financial contributions to the Green Climate Fund<sup>27</sup>.

Cooperation to develop a climate change regime is an imperative for all the countries involved in development- environment dilemma to shift gear towards sustainable development. But this cooperation is more embedded in the North-South differences in development perceptions and concern for national interest than for global common concern. In particular, this perception is based on the premise that the largest part of green house gases emissions (GHGs) originated in the developed countries as they were the first to industrialize and therefore these countries have the largest responsibilities for combating historic emissions<sup>28</sup>.

Paris Climate Change Agreement has entered into force on Fourth November 2016 making for the first time in the history of climate change negotiations where governments have agreed to legally binding emissions to limit global temperature rise. Besides United States of America and China, India has recently (on October 2, 2016) ratified the treaty and has become part of the global agenda to reduce emissions and contribute to green planet. The Paris Agreement sets a new agenda for the world leaders and policy makers to plan practical targets for the implementation of the agreement and distribution of climate finance to the most vulnerable and poor countries<sup>29</sup>.

### **Disaster and Vulnerability Inter-relationship**

Reported disaster events are now more frequent that not only highlight economic loss and damages but also reflect human vulnerabilities to disaster. Vulnerability to natural disasters and their consequential impacts are not yet at the forefront of development agenda. Vulnerability is the susceptibility of the individual or the community to natural hazards which results from the interaction of a community with its environment. This also reflects a complex interaction of factors like the level of socio-economic development, existing inequalities and distribution of

resources and demographic pattern that determines the vulnerability or resilience of a social group to disaster<sup>30</sup>.

A disaster occurs when hazard interacts with vulnerability<sup>31</sup>. The damaging impact of natural disasters both in terms of socio-economic loss and environmental degradation has generated response to understand disasters. The definition of natural disaster as put forward by Gilbert .F. White states disaster “is an interaction between people and the nature governed by the co-existent state of adjustment in the human use system and the state of nature and the natural event system” understanding disaster from human ecology approach so as to examine how people cope with risk and uncertainty in the occurrence of natural events (especially floods) <sup>32</sup>.

Blakie (et.al) describes disaster as the intersection of two opposing forces: those processes generating vulnerability on one side and, physical exposure to hazards on the other. Moreover it is the socio–economic factors that make people vulnerable to hazardous natural events creating severe stress on lives and livelihoods of the people in the larger eco system<sup>33</sup>. According to Mary B. Anderson the term “natural disaster” seems to be justified when we consider the negative impact of natural phenomenon on human life, its economy, its society, and its polity<sup>34</sup>.

The World Bank has contextualized natural disaster in terms of economic loss and damage. Considering disaster as an extraordinary event of limited duration or, strictly speaking, a natural disaster event causing serious disruptions of the affected countries economy. The World Bank necessarily takes into account extraordinary emergencies like disasters from the standpoint of economic recovery and reconstruction programs as a part of development strategy<sup>35</sup>.

Hazards are imbedded in the larger political, social, economic and technological structures and therefore often impossible to separate these influences from the impacts of the events. The fact

that people live in places prone to disasters whether due to their own choice ignorance, or compulsion is one such factor Another is the capacity and/ or, willingness or unwillingness of the political authority to take steps to alleviate the potential human cost of events that occur This ultimately reflects the level of development scenario and its coping capacity to deal with disasters<sup>36</sup>. J. K. Mitchell points out that the question circumscribing the issue of natural disaster are still relevant as they were fifty years ago but today no longer disasters can be viewed and analyzed in a singular framework. It is “a complex interaction between natural, societal, technological, political and economic system which results in a disaster”<sup>37</sup>.

Disaster can be described as a calamity or hazard that has the capacity to induce substantial loss of life or property or both and transforms into a disaster, when it is beyond the capacity of the victim to withstand the situation. The United Nations Report 2004 describes disaster as a serious disruption of the functioning of the community or society causing widespread human, material, economic or environmental losses which exceeds the ability of the affected community or society to cope with using its own resources<sup>38</sup>. According to the Disaster Management Act 2005, India defines a disaster as ‘a catastrophe, mishap, calamity or grave occurrence from natural or manmade causes, which is beyond the coping capacity of the affected community’<sup>39</sup>. Disasters as such result from the combination of three key elements viz. natural hazards, exposure of people and vulnerability factor.

From the above description on the concept of disaster it is quite clear that the interpretation and understanding on disasters has significantly changed from 1950s onwards. Traditionally regarded as ‘natural’ the perception has changed to take into consideration disaster causing agents or actions of man. This has resulted in a paradigm shift in interpretation of natural calamities to take into account associated vulnerabilities and risks that turns hazards into disaster. The

interpretation on disasters as a result has bifurcated into two major strands of thought. The first strand is represented by the human-ecological approach advocated by Gilbert White (1974), Hewit (1983) and others. The second strand reflecting the radical (structuralist) paradigm or Marxist structuralist paradigm highlights human vulnerability especially in the third world countries due to marginalization of the poor in a globalized economy<sup>40</sup>.

### **Natural Disaster and Sustainable Development Linkage**

Against the above backdrop the question of sustainable development protecting humanity as a whole brings in one of the most important discourses on natural disaster and sustainability of the development scenario. Disaster is closely linked to the process of development. Disasters triggered by natural hazards put development gains at risk. At the same time disaster risks are generated and accumulated due to unsustainable pattern of development being pursued through inappropriate development interventions often manifested in rapid degradation of the natural environment and enhanced vulnerability of the people<sup>41</sup>. Anthony Oliver-Smith argues “disasters occur at the interface of society, technology and environment that are fundamentally the outcomes of intersection of these features”<sup>42</sup>.

Disasters also indicates the success or failure of a society to adapt to certain features of its natural and socially constructed environment in a sustained manner that creates vulnerability to a large section of the population particularly the poor and the marginalized in developing societies. The increasing complexity of disasters is rooted in the interplay of social and economic factors in the environment, exacerbating the vulnerability of people and environments and intensifying their impacts when they occur<sup>43</sup>. The vulnerability of a large section of the population has been indicated in the World Development Report 2010 mentioning that thirty years ago half the developing world lived in extreme poverty. At present a quarter of the developing countries still

lives in less than \$1.25 a day. One billion people lack clean drinking water, 1.6 billion lack electricity and 3 billion people lack adequate sanitation. A quarter of all the developing countries children are mal-nourished and half the population of the global south is undernourished<sup>44</sup>. Yet the fact remains that the figures have not appreciably changed since the first calculations were made in 1990s<sup>45</sup>.

The above figures are also indicative of the fact that the people living in the developing countries are among the most vulnerable to disasters. The Global Environment Outlook-3 Report has mentioned disasters as one of the major concerns for the security of the people and the environment. The Report further states that the impacts of natural disasters are high due to unsustainable pattern of economic development resulting into environmental degradation and possibly global climate change<sup>46</sup>.

The environment- development-security linkage has brought to address development discourse both in terms of environmental sustainability and security to meet the needs of the future generation because “at the centre of sustainable development is the delicate balance between human security and the environment”<sup>47</sup>. In a similar vein David Pepper noted that in the contemporary world, it is a tragedy that the model of development is not a balanced one<sup>48</sup>. While analyzing the post 1945 development strategy Bjorn Hettne points out that the “classical development strategy unfolded historically in a dialectical fashion” oscillating between “mainstreams” and “counterpoint paradigms”. This differentiation of approach to development can simply be distinguished into modernization and dependency approach to development<sup>49</sup>. This provided the contrasting contours to be followed to achieve development which was considered problematic particularly for the developing world. The path to development lay in removing all obstacles to development for the developing according to Andre Gunde Frank that inevitably

created “underdevelopment”. The choice of development strategy for most of the world or the developing world was made by the west which was structured on a dependent relationship<sup>50</sup>.

From the Dependencia position Wallerstein’s contemporary analysis of world system presents the state and its economy in a core-periphery relationship. The state in the global era by the virtue of its structural powers continues to provide a framework for activity within the global economy. This results in the gross over exploitation of the resources and unequal North – South relations<sup>51</sup>. From the neo-realist position Kenneth Waltz also attempts to explain the contemporary international situation characterized by power being exercised by the leading actors over others creating an unjust order<sup>52</sup>. The eco-feminist perspective shares a similar sensitivity towards post-development critique of development. Since most of the third world women work closely to the land, sustaining their household with the most basic connections to nature, they nurture a close, intimate and sensitive relationship to local ecosystem. This is often suppressed or violently denied by the masculine, western driven notion of development, a threat to nature and human survival<sup>53</sup>.

In this context it may be noted that environment - development interrelationship is connected to a multi dimensional process. The pursuit of capitalist mode of economic development has spillover effect resulting in new challenges and crisis in terms of efficient resource allocation and its management. The global environment scenario towards the end of twentieth century reveals an extremely divided and increasingly over exploited nature’s wealth. The Global Report, 2000 also noted that if present trend continues, serious stresses involving population, resources and environment are clearly visible with the result that despite greater material output, the world’s people will be poorer in many ways than they are actually at present which is still applicable in the current scenario.



Under the above circumstances it could be stated that the sustainable development agenda puts forth the promise to mitigate the long standing tension between protection of the environment and economic growth. The origin of sustainable development discourse can be traced back in a critical rethinking of development reflecting in the radical environmentalism of 1970's. This radical position on environment and development was generated by the radical theorists who argued that environment degradation arises due to the capitalist mode of production. The radical perspective considers environmental degradation and associated concerns and issues as directly related to liberal (neo-liberal) capitalist–global model of development<sup>54</sup>.

This radical perspective represents two strands of thought, converging and diverging at time regarding the understanding of the sustainable development agenda. The first strand is the radical green thought, presenting a critique of the environment-development perspective within the neo-liberal capitalist –economic position. The second strand reflects the radical (neo-marxist) critique of development-environment position. According to the radical green position, the sustainable agenda is more “anthropocentric” in nature as it takes into the promotion of human welfare as its central concern. They argue that rather than worrying about sustainable development the focus should be more on sustaining the natural environment. Moreover they also critically explore the confused/diffused dividing line between environmental limits and modern economic growth<sup>55</sup>.

The radical neo Marxist position consider that environmental degradation is the direct result of the process of production, accumulation and reproduction which is central to capitalism. The radical perspective is based on the argument that all such multi lateral organizations engaged in projecting development as sustainable process are reinforcing the existing power structures instead of looking into the root causes of ecological disaster that results in the domination of the capitalist (rich) north over the international decision making procedure. The neo Marxist position

argued that the sustainable development agenda is a crude attempt to impose the northern environmental agenda on the south. By adhering to this logic it translates into forcing countries whose primary concern should be economic development to adopt those environmental measures which are really intended to protect the economic hegemony of the industrialized nations<sup>56</sup>.

According to Gustavo Esteva this “redevelopment” conceptually and politically is now taking the shape of sustainable development in the mainstream development ethos. Particularly for the North, sustainable development means “redevelopment” that is, to develop again what was mal-developed or is now obsolete. But sustainable development for the global South means something different. In its mainstream interpretation, sustainable development has been explicitly conceived as a strategy for sustaining development, not for supporting the flourishing and an infinitely diverse natural and social life” but to adhere to those environmental measures that would protect the economic hegemony of the global west<sup>57</sup>.

Two international events generally mark the evolution of the concept of sustainable development starting with the Stockholm Conference of 1972 and finally defined in the Brundtland Commission Report 1987. The “concept of sustainable development” is based on two broad parameters a) intergenerational equity and b) substitutability of resources to maintain the ecological well being of the earth<sup>58</sup>. The Brundtland Commission Report addressed the term “sustainable development” describing it as “a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development and institutional changes are all in harmony and enhance both current future potential to meet human needs and aspirations”. The Report defines the concept of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”<sup>59</sup>.

According to David Reed sustainable development implies the process by which the total stocks should be held constant so that future generations have the same capability to develop as the current generation. Sustainable resource management attempts to bring together two strands of thought regarding the management of human activities – (a) concentrating on development goals (b) and controlling or limiting the harmful impacts of human activities on the environment which requires an approach to decision making that shall be integrative, adaptive and interactive<sup>60</sup>.

The notion of sustainability calls for a more analytical and inclusive view of development that explicitly takes into account the ecological health, stock of natural resources, economic well being and the democratic processes of redistributive justice. W.M. Adam while addressing the issue of development, environment and sustainability states that the history of thinking about sustainable development is closely linked to the history of environmental concerns and people's attitude to nature, representing responses to the changing scientific understanding, knowledge about the world and has deep historical roots and the right ideas about society<sup>61</sup>.

The concept of sustainable development in a more broadened formulation could be explained not only in terms of economics or environment but also in terms of socio-economic development. According to Roberto Guimares development calls for a new style of functioning which a) must be **socially sustainable** in the reduction of poverty and inequality and in promoting social justice, b) that is **environmentally sustainable** in the access and use of natural resources and in the preservation of biodiversity; c) that is **culturally sustainable** in the conservation of the system of values, practices and symbols of identity that in spite of their permanent evolution determine national integration through time; d) and that is **politically sustainable** by deepening democracy and guaranteeing access and participation of all sectors of society in public decision making process<sup>62</sup>.

This development strategy must be guided by a new development ethics, one in which the economic objectives of growth are subordinated to the laws governing the operation of natural systems, subordinated as well to the criteria of human dignity and of improvement in the quality of people's life. In other words both sustainable human development and promotion of human security must be incorporated together to bring about the desired scenario of development<sup>63</sup>. Despite the ongoing debate on the actual meaning of development a few common parameters have emerged that guides the basic understanding on sustainable development. Firstly, it is a commitment to equity, fairness and justice; secondly, it is a long term emphasis on precautionary principle emerging from threats of serious and irreversible damage to be applied by the states according to their capabilities and thirdly, understanding the complex interdependence of environment, economy and society not as in a balancing capacity of adjusting one with the other but recognizing the interdependence of all these three pillars of sustainable development.

Contextually addressing the interdependence of natural disaster with development the Stockholm Conference stated clearly in Principle 9 that "Environmental deficiencies generated by the conditions of under development and natural disasters pose" grave problems and can best be remedied by accelerated development through the transfer of substantial quantities of financial and technological assistance as a supplement to the domestic efforts of the developing countries and such timely assistance as may be required<sup>64</sup>.

The Brundtland Commission Report also recognized that disasters are a major threat to human well being and mentioned the gravity of natural disaster in relation to development and its inter connectedness to the issue of poverty. The Report also pointed how disasters affect the poor particularly in the developing countries where incidence of death and loss to economy is the highest due to over population which poses a threat to the sustainable development agenda<sup>65</sup>. The

United Nations Conference on Environment and Development (UNCED) or the “Earth Summit” 1992 took forward the agenda of sustainable development. The most important outcome of the UNCED Conference was Agenda 21 a global “Plan of Action” for achieving sustainable development in the twenty first century. Agenda 21 Chapter 7, Section F recognizes natural disaster as one of the important threats to security of the people and its impact on human life which jeopardizes their safety and enlargement of threats that requires action in the area of human security<sup>66</sup>.

Development to become sustainable requires modification in the current strategies with a keen focus on threats that try to topple the progress that has been achieved so far. Over time notion of sustainable development has evolved to recognize that efforts to build a sustainable way of life requires the integration of action in three key areas: economic growth, conserving natural resources and the environment and social development<sup>67</sup> so as to securitize the lives of the individuals and communities against vulnerabilities and risks. The ultimate objective of development according to the noted scholar Amartya Sen “has to be judged ultimately in terms of what it does to the lives of human beings”. The enhancement of living conditions must clearly be an essential, if not the essential object of the entire economic exercise and that enhancement is an integral part of the concept of development<sup>68</sup>.

Twenty years later after the Earth Summit of 1992 at the Rio+20 Conference, a resolution was adopted known as “The Future We Want” by the international community that laid the groundwork to incorporate in a balanced way all three dimensions of sustainable development (environment, economics, and society) and their inter- linkages for pursuing the agenda in the future framework of Millennium Development Goals (MDGs: 2000). Also in terms of MDGs addressing disaster issues normally comes as the member country’s commitment procedure to

fulfill the agenda of sustainable human development. In September 2000, the international community came together to adopt what would become known as the Millennium Development Goals (MDGs) representing the idea that there exists a fundamental level of rights and freedoms to which all humans are entitled<sup>69</sup>.

The eight goals addressing the MDG's targeted to be completed by 2015 are to end poverty and hunger, achieve a universal primary education for all, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS malaria and other diseases, ensure environmental sustainability and promote a global partnership for development. The MDG's provide a concrete, time-bound, measurable framework for tackling various dimensions of extreme poverty and environment degradation. They are arguably the most comprehensive, ambitious and broadly supported development goals ever agreed upon by the international community.

There is broad agreement that, while the MDGs provided the broad framework around which the states could develop policies to end poverty and improve the lives of poor people but they were too narrow in scope and implementation. The MDGs were supposed to be achieved by 2015 and ambitious enough aiming for an end to poverty. However the MDG's failed to address the root causes of poverty and overlooked gender inequality as well as the holistic nature of development.

The Post 2015 development agenda that emerged as a successor to the MDG's was built on the principles agreed upon in "The Future We Want". The Sustainable Development Goals (SDGs): Transforming our world: the 2030 Agenda for Sustainable Development adopted in 2015 (September 25) is a set of seventeen aspirational "Global Goals" with 169 targets between them. The SDGs follow an expanded format of MDGs and act a new, universal set of goals and targets for the member countries to frame their agendas and policies over the next fifteen years. The

Post-2015 development agenda articulates that “no one is left behind”. This means targeting most vulnerable people and those living on the margins of the society brings forth a bottom up approach to development so that no one is left behind. This also means working toward shared progress that not only benefits those near the top of society, but also those who are so often on the margins of the society<sup>71</sup>.

Disaster as such poses a major threat to these vulnerable people and to those who are often on the margins of the society. The lives of all must be secured in the context of vulnerabilities and risks be it social, economic, political or natural sustainable development goals needs to make sure that “no one is left behind” when it comes to addressing disaster-development (social, political and economic) linkage. At the same time ensuring that everyone has a role to play in implementing the global goals towards development, be it governments, institutions, civil society, non-governmental organizations, communities, individuals and all other stakeholders.

### **Natural Disaster and Human Security Linkage**

Under these circumstances natural disaster has been linked quite naturally with the issue of security to be considered in terms of non traditional security<sup>72</sup>. Such “existential threats” to security concerns posed by natural disasters makes it mandatory to address it within the context of human security. In fact when natural disaster strikes it is not only the natural environment which requires protection and conservation but also the socio-economic factors that require immediate attention for protection against threat to human security. It is within this broad parameter that the threat to human security from natural disaster has been explored.

Security is collaterally related to national security within a world which is inherently contentious and anarchical. Here the “referent” point is the “state” that highlighted state-centric security

studies. The last two decades has seen the rise of non-traditional security concerns challenging the traditional notion of security thereby shifting the referent point from the “state” to the “individual”<sup>70</sup>. This led to the deepening of security studies that began as an independent field of enquiry and was later absorbed as a sub field of International Relations<sup>73</sup>.

The Copenhagen school was instrumental in broadening the “existential threat” to state security. The analysis of security is based on twin concepts (either/or) of power (realist school) or peace (idealist school) agenda. According to Barry Buzan security is a relative concept to be realized in the context of an “existential threat”<sup>74</sup>. Buzan identifies these threats as i) social threats (physical pain ,injury, death) ii) economic threats (destruction of property, denial to access to work, or resources) iii) threats to rights (imprisonment or denial of normal civil liberties) and iv) threats to position or status (demotion, public humiliation and others). Therefore “individual security must be pursued within what might be called social and economic threats those arising from the fact that people find themselves embedded in a human environment with unavoidable social, economic and political consequences”<sup>75</sup>.

In a similar vein Peter Hough identifies nine “existential threats” to global security such as 1) military threats to security from other states actors 2) military threats to security to states from non-state actors; 3) economic threats to security; 4) social identity as a threat to security; 5) environmental threats to security; 6) health threats to security; 7) natural (disaster) threats to security; 8) accidental threats to security and 9) criminal threats to security. This enquiry into security study recognizes “threats to the lives of people” ranging from military security to natural disaster that undermines human security<sup>76</sup>.



The United Nations Human Development Report of 1994 shifted the focus of “security” from the protection of the state to the protection of the individuals emerging from a wide range of “threats” to human security<sup>77</sup>. The Report defined “human security” as including “safety from such chronic threats as hunger, disease and repression and protection from sudden and hurtful disruption in the patterns of daily lives, whether in homes, jobs or communities”. This report presented seven broad categories of threats to human security encompassing economic insecurity, food insecurity, health insecurity, personal insecurity, community and cultural insecurity, environmental insecurity and political insecurity.

The Report further stated human security not as a concern with weapons but as a concern with “human life and dignity” focusing on four main components. Firstly it is universal in nature, as it is relevant to people everywhere because threats are common to all; secondly all its components are interdependent since the threats to human security is transcendental and not bound within territorial boundaries, thirdly it is easier to achieve with early intervention than late action; and finally it is people-centered because it is concerned with how people live their life from “freedom from fear” and “freedom from want”. To “live with dignity” was also addressed in the United Nations Development Programme (UNDP) Report of 1997 from the point of eradicating poverty because poverty increases vulnerability and indicates denial of choices and opportunities for living a tolerable life<sup>78</sup>.

The Commission on Human Security (CHS) in 2001 was established to develop the concept of human security as an operational tool for policy formulation and implementation and to propose a specific programme of action to address critical and pervasive threats to human security”. The 2003 Sen-Ogata Report “Human Security Now” articulated that human security complemented state security as the individual and the community represented an integral part of state security.

The Report noted that whereas development is focused on achieving equitable growth and sustainability, human security goes further to address the “conditions that maintains the dignity of human beings”<sup>79</sup>. To address the issues of human security requires an integrated approach which means achieving security would include not only protecting but also empowering them.

While analyzing the critical and pervasive threats to human security, Sabina Alkire in the working papers, titled “A Conceptual Framework for Human Security” puts forth the objective of human security is to safeguard the vital core of all human lives from critical-pervasive threats in a way that is consistent with long-term human fulfillment. Threats to human security are *critical* when they threaten to cut into the core activities and functions of human lives. Furthermore, the threats are *pervasive* when i) the threat is large scale (within the population under consideration) and/or ii) the threat may come again and again over time; (in case of natural disasters) <sup>80</sup>.

To address and operationalize the concept of human security various government initiatives led the way in institutionalizing human security concerns into their respective foreign policy formulations. Canada approached human security from the perspective of conflict and conflict resolution, particularly in Afghanistan, where it was engaged in the combat operations on Global War on Terror<sup>81</sup>. Norway likewise focused on the freedom from fear aspects of human security, and identifies core agendas of preventive action, peace operations and security from violent conflict on humanitarian grounds. Japan was engaged with the broader concept of human security expanding its agenda far beyond conflict resolution and humanitarian intervention which “comprehensively covers all the menaces that threaten human survival, daily life and dignity and strengthens efforts to confront these threats”<sup>82</sup> Australia approached the security agenda by linking individual security as a part of the human security paradigm with national security<sup>83</sup>.

The various dimensions addressed above either complement or supplement the basic tenets of human security. These interpretations can be grouped into three basic categories ---a) human security and human rights, b) human security and human development, and c) human security and basic needs approach. In this context Amitav Acharya points out that there are three different conceptions to human security: one focusing on the human costs of violent conflicts, another stressing human needs in the path to sustainable development, a third conception approximating the first more than the second, emphasizes the human rights dimensions of human security without linking to the costs of violence<sup>84</sup>.

While building the linkage between human security and economic development T. Caroline was shifting the focus from national security to individual security and particularly to a focus on individual needs. Accordingly Caroline describes human security as a condition of existence in which basic human needs are met and in which human dignity, including meaningful participation in the life of the community can be realized<sup>85</sup>. In this context it is pertinent to mention the United Nations Secretary General's Report "In Larger Freedom" (2005) indicate that all people have the right to security and to development thereby linking human security with sustainable development agenda<sup>86</sup>. It is apt to mention here that human development and human security are interlinked. On the one hand human development is a broad concept, aiming at enlarging people's choices and freedoms on the other human security calls for people – centered, comprehensive, content specific and preventive oriented responses as security is a pre condition for lasting peace and fundamental to the achievement of human development.

Natural disasters as such must be understood as a threat to human security and sustainable development. The threat of natural disaster is complex, comprising economic factors, political choices and actions and threat arising from vulnerabilities. Threats emanating from natural

disasters are considered as a threat to the lives and livelihood of the individual socially, economically, politically and culturally situated as the “referent object” of human security analysis. Human security promotes a people-centered approach which emphasizes the need for capacity building exercises to empower people and communities impacted by disasters.

Securitizing natural disaster within human security perspective would be regarded as essentially strengthening the initiatives by raising awareness, management of resources and management of disasters to deal with natural calamities. Disaster mitigation and preparedness requires development of policy initiatives by ensuring resilience measures and human security considerations taken into proper perspective. Disaster management also calls for a more multidisciplinary perspective covering issues of sustainable development and security interwoven together so as to generate a holistic understanding to deal with disasters.

The focus of human security is on threats, implying understanding of threats in order to implement preventive measures by strengthening the regulatory and institutional mechanisms of disaster management<sup>87</sup>. It is therefore vital to understand that threats emanating from natural disasters require proper preventive measures and management strategies to build a sustainable process of development. Disaster management involves both the emergency operation in a disaster and as well as rebuilding the lives of the people in the aftermath of a disaster. This requires the integration of disaster management into policy response at all levels of governance.

While natural disaster is closely linked to the issue of sustainable development and human security its management leads to the understanding of the issue of governance. Governance denotes to pilot or steer or how to design rule making for the functioning of the state. It also reflects the combined efforts of state and civil society institutions under a political system to

promote socio-economic and political development. The focus of democratic governance therefore is on interactions with the formal and informal institutions reflecting on a state-society inter-relationship necessary for disaster management. This also incorporates formal and informal institutions and networks of people's participation to bring in effective governance to address disaster scenario<sup>88</sup>.

The international exercise on recognition of natural disaster specifically as a threat to human wellbeing began with the adoption of the International Decade for Natural Disaster Reduction (IDNDR) by the United Nation General Assembly Resolution (UN/GA44/236) in December 1989<sup>89</sup>. Subsequently United Nation's first World Conference on Disaster Risk Reduction (WCDRR) commonly known as Yokohama Strategy and "Plan of Action for a Safer World" 1994 was the next step to recognize disaster management as part of sustainable development agenda<sup>90</sup>. The Hyogo Framework for Action (HFA) 2005-2015 built upon the past experiences on disasters like the Indian Ocean Tsunami 2004 brought about changes in the overall disaster management strategy "moving from culture of relief management" to "culture of disaster preparedness" which was to link natural disaster, sustainable development and human security<sup>91</sup>. To address the Post 2015 Framework for Action and build the strategy in managing global disaster risks the Sendai Framework (2015-2030) recommended the strengthening of good governance in disaster risk reduction. This strategy is focused to "Build Back Better" (BBB) i.e. post recovery and reconstruction programmes at the national, regional and global levels to be incorporated and implemented in development plans and policies of all the member countries so as to secure the lives of the individuals from "threats" to disaster<sup>92</sup>.

The exposure and experience from the past mega disasters has contributed to a gradual but consistent paradigm shift in India's policy on disaster management. After the Tsunami 2004

experience though security of the people constituted an important aspect of disaster management in India, the uncoordinated exercise in addressing natural disasters led to a rethinking of disaster management policy from human security perspective. India came out with a “Status Report on Disaster Management” in 2004 followed by the Tenth Five Year Plan (2002-2007) that for the first time recognized disaster management from development perspective. Finally it led to the enactment of Disaster Management Act 2005 to set up a new legal institutional framework of disaster management in India.

Bangladesh has also attempted to come up with a disaster management strategy. Bangladesh like India had formulated a general policy of disaster management of “relief and rehabilitation” on a sectoral basis which ultimately came to be revised after the Tsunami of 2004. Bangladesh had come up with the Comprehensive Disaster Management Programme (CDMP) in 2004 adopted by the Government with support from donor partners followed by the National Disaster Management Policy in 2008 and the National Plan for Disaster Management envisioned in 2010.

Disaster management also requires understanding on the issue of governance as ultimately managing of disaster related activities such as relief, response, recovery and preparedness depends on effective governance capacity of the state and the functioning of the government and the civil society in public sphere. The present study tries to address the issue of governance with regards to disaster management both in Bangladesh and India. The work will also include both government and civil society inter-relationship to understand disaster governance and to bring in the notion of human security to address disasters.

It is not possible to take an in depth study of all the countries of South Asian region separately, for the purpose of the research work. The study will therefore concentrate for the present dissertation only on two countries- Bangladesh and India which are commonly vulnerable to

natural disasters like cyclones and floods on a regular basis. At the same time the study will highlight the lacunae and shortcomings present in the disaster management framework in both the countries. The time frame of the research period (1995-2010) reflects the international exercise on the one hand to recognize disaster as a “threat” to human existence and linking disaster management with sustainable development agenda on the other. This also reflects the institutionalized policy response coming from the countries to mainstream disaster management in respective national plans and policies. It is within this time frame that the case studies have been taken up for addressing the disaster management scenario in both Bangladesh and India.

The above developments does call for an in-depth study of the linkages between natural disaster, sustainable development and human security concerns in the context of disasters At the same time it is quite natural to go for a detailed understanding and analysis of disaster management issues both at the international as well as at the regional and national levels so as to find the problems and challenges associated with and shortcomings present with disaster management strategy at their different levels of implementation.

On the basis of the above discussion the work has identified the following **research questions** that will be addressed in the following chapters. In brief the work will concentrate on the following research questions.

1. How natural disasters are linked with sustainable development and human security?
2. What are the existing strategies as well as responses available to address the issue of natural disaster? Are they adequate enough to address natural disaster management?
3. How international disaster management strategies are helping Bangladesh and India to resolve disaster management problems?

4. How does India respond to natural disaster? What are the lacunae in India's response to natural disaster management?
5. How does Bangladesh respond to natural disaster? What are the lacunae in Bangladesh's response to natural disaster management?
6. Can there be any alternative disaster risk management mechanisms to make human security a reality in both Bangladesh and India?

To address the research questions the **methodology** that has been followed in the present work for addressing the chapters intends to be essentially empirical with broad comparative method applied with specific case studies along with questionnaire survey and field research. The emphasis is on analytical arguments and interpretative perspective to develop the theoretical understanding. The study applies the comparative method with structured focused comparison of case study method. The systematic study of the research work incorporates the above mentioned methodology. There will be extensive use of primary documents and reports. Books, scholarly articles, journal publications and print media publications have been extensively used as sources of secondary materials. Personal interviews and conversation conducted during field visits. Collection of data and statistics has been sourced from government publications and other institutional publications, news paper articles etc. Websites have also been accessed to collect data from the public domain. With the aim of identifying existing mechanisms and patterns of policy norms and regulations for establishing disaster as one of the major threats to sustainable development within human security perspective the above methodology has been followed to address the present study.

The **relevance of the study** lies in the fact that natural disasters have been seldom recognized from the perspective of human security and this study tries to address disaster from a human



security angle. Documented and analyzed from a geographical or socio- economic perspective very few literatures have recognized the perspective of human security as a response to disasters. Consequently securitization of disaster from the prism of human security remains unexplored. The increased intensity of disasters particularly with reference to Bangladesh and India therefore requires prioritizing more useful and relevant materials for all research issues on disaster management. There are very few comparative work on disasters addressed from human security perspective within the Indian sub-continent despite the presence of high incidence of disasters and institutionalized policy response coming from the member states. The study will therefore attempt to fill the existing lacunae.

Against the above analysis, in **conclusion** it can be stated that the present study attempts to puts forward a theoretical exposition to consider natural disaster from the perspective of human security. Natural disaster also requires a multidisciplinary perspective covering issues of sustainable development and security interwoven together to address the security question. The focus of disaster management at the global level has shifted from post relief to pre-disaster preparedness. This calls for action at the regional and national level to reduce disaster vulnerabilities of the people especially in Bangladesh and India, the focus area of the study.

Analysis of disaster within human security perspective and sustainable development agenda establishes the linkage that vulnerabilities must be removed to bring in sustainable development. Disaster is linked with human security as it is a threat to human wellbeing and human security cannot be ensured in the light of threats. Disaster requires human security and sustainable development inter-linkage for bringing out recognition for disaster as a human security concern. Thus it is relevant to find the existing mechanisms addressing natural disaster as a human security concern at the international and regional levels in the next chapter.

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## *Annexure I*

### *Natural Disasters: Sub Groups: Definition and Classification*

<i>Disaster sub-group</i>	<i>Definition of Disaster</i>	<i>Disaster Main Types</i>
<i>Geophysical</i>	<i>Events originating from solid earth</i>	<i>Earthquake, Volcano, Mass Movement (dry)</i>
<i>Meteorological</i>	<i>Events caused by short-lived/small to meso scale atmospheric processes (in the spectrum from minutes to days)</i>	<i>Storm</i>
<i>Hydrological</i>	<i>Events caused by deviations in the normal water cycle and/or overflow of bodies of water caused by wind set-up</i>	<i>Flood, Mass Movement (wet)</i>
<i>Climatological</i>	<i>Events caused by long-lived/meso to macro scale processes (in the spectrum from intra-seasonal to multi-decadal climate variability)</i>	<i>Extreme Temperature, Drought, Wildfire</i>
<i>Biological</i>	<i>Disaster caused by the exposure of living organisms to germs and toxic substances</i>	<i>Epidemic, Insect Infestation, Animal Stampede</i>

*Source: Ref: ANNUAL DISASTER STATISTICAL REVIEW 2012, p 7. Available at: <http://www.emdat.be/classification>.*



## *CHAPTER – II*

### *Existing Regulatory Mechanisms to Address Natural Disaster Management at International and Regional (South Asia) Level*

#### *Introduction*

The threats emerging from natural disaster require specific attention and management. There has been a major conceptual shift in the understanding to cope with disasters. Vulnerability to natural disasters has increased due to unsustainable pattern of development strategy and the people are at the receiving end of this ecological disaster<sup>1</sup>. Humanitarian assistance is a traditional and ongoing process to address disaster. The present scenario requires specific focus on addressing risk to reduce the vulnerability of communities and assets. This management of risks and vulnerabilities associated with disasters has resulted in formulation of risk management framework for mitigation and mainstreaming of disaster reduction at policy level to address the security of the people affected by disasters<sup>2</sup>.

To ensure a sustainable pattern of development integration of disaster issues and its management into policy responses at all levels of governance including international, regional and national levels has become a necessity. The strategies and mechanisms adopted in the last two decades refer to several significant actions and policy initiatives taken in the field of disaster management. This paradigm shift is reflected at the global level of policy making with integration of disaster preparedness and mitigation into disaster management<sup>3</sup>. This effectively has also shifted the focus of mechanisms from post relief to pre-disaster preparedness, from

moving towards “culture of relief management” to “culture of disaster preparedness” to deal with disaster situations and address recovery after a disaster event<sup>4</sup>.

### ***Existing International Framework and Concern for Natural Disaster***

The concern for environment and development had already begun in the 1970's. It started reflecting on the international forums and particularly in the United Nations when the international organization started integrating concerns for various issues including environment development, poverty and the issue of natural disasters to be integrated into the agenda of development<sup>5</sup>. Prior to the Stockholm Conference the United Nations (U.N) General Assembly in March 1972 adopted a Resolution on Assistance in Disaster situation noting the fact that throughout history natural disasters and emergency situations have inflicted heavy loss of life and property and has affected every country and people especially impacting developing countries. The international community has come to the aid of countries in disaster situation<sup>6</sup>.

The U.N. General Assembly called upon the Secretary General to appoint a Disaster Relief Coordinator who would be authorized on his behalf to advance effective arrangements for proper assistance to countries affected by disaster event. This concern towards natural disaster was a relief and coordinating exercise of the UN body and its other agencies like the ECOSOC towards assistance in disaster situations. Most of the times it was humanitarian in nature performed with cooperation from the Disaster Relief Coordinator<sup>7</sup>. Ultimately it was the United Nations Conference on Environment held in Stockholm 1972 that started the international exercise to generate concern for environment and its sustainability. The platform raised the difference in perception regarding environmental degradation for the West and the developing world.

The **Stockholm Conference 1972** was first international conference to address the issue of environmental sustainability on a global scale<sup>8</sup>. This was result of the growing environmental concerns in developed countries that resulted in a response to address the negative impacts of industrialization on the society. Maurice Strong, the Secretary General at the Stockholm Conference drew upon the agenda demonstrating awareness that economic development without proper regard to environmental constraints was both wasteful and unsustainable. The Stockholm Conference placed the environment–development inter-relationship on the international political scene<sup>9</sup>.

The debate over integrating environment and development issues reflected the agenda of both the developed and the developing countries pressing their own concerns. The attention of the developed world was more towards conservation of resources, population explosion, pollution and limits to growth where as the developing countries wanted a more inclusive agenda to be addressed such as the issue of “basic needs” (food, shelter, water), economic development and poverty reduction to be integrated with environment–development concerns which called for multilateral policy making at the international level<sup>10</sup>.

While addressing the issue of unsustainable development and environmental degradation the Conference accommodated the concern for natural disasters having the potentials to cause environmental problems which can be remedied by accelerated development assistance both financial and technical to the developing countries. As such they must be addressed to bring about a proper understanding on the concerns for development. **Principle 9** of the Stockholm Conference Document stated that environmental deficiencies generated by the conditions of underdevelopment and natural disasters pose grave problems and can best be remedied by

accelerated development through the transfer of substantial quantities of financial and technological assistance as a supplement to the domestic efforts of the developing countries as such timely assistance may be required<sup>11</sup>. Further, **Principle 20** of the Report substantiates the above principle when it states that environment friendly technologies must be made available to developing countries in terms which would encourage their wide dissemination without constituting an economic burden on the developing countries<sup>12</sup>.

The **Bruntland Commission Report 1987** was the next major institutional engagement to bring into focus the broader issues to address the sustainable development agenda. The Report “Our Common Future: A Global Agenda For Change” stressed the need for development strategies to be adopted in all countries that recognized the limits of the ecosystems ability to regenerate itself and absorb waste thereby linking environmental protection with economic development<sup>13</sup>. The Report also recognized that disasters are a major threat to human well being and advocated incorporating the issue of disasters to build the agenda of sustainable development. The Commission strongly mentioned the gravity of natural disaster and its interconnectedness to the issue of poverty and how disasters affect the poor’s of the world particularly in the developing countries where incidence of death and loss of economy is the highest due to over population<sup>14</sup>.

While addressing the issue of natural disaster, poverty and sustainable development linkage, the Commission further stated that widespread poverty entails stress on environment development relationship. Sustainable development requires meeting the basis needs of all and extending to all the opportunity to fulfill their aspirations for a better life. A world in which poverty is endemic will always be prone to ecological and other catastrophes. The vulnerabilities created due to unsustainable pattern of development enhance the risks associated with extreme events<sup>15</sup>.

## *U.N Exercises on Natural Disaster Management*

### *(I) Proclamation of the International Decade for Disaster Risk Reduction (1989-1999)*

Systematic and specific action for disaster risk reduction began when the United Nations General Assembly Resolution 44/236 of 1989 proclaimed the decade of 1990's as the International Decade for Natural Disaster Reduction (IDNDR 1989-1999) influencing global building guidelines and standards not only at the international level but also response generated at the regional and national levels<sup>16</sup>. This was the first major international institutional mechanism to address the issue of natural disaster. It is to be noted that the need to reduce disaster risk achieved international prominence when the United National in 1987 with the General Assembly Resolution 42/169 designated the 1990's as the IDNDR<sup>17</sup>. The Decades significance was further endorsed by Resolution 44/236 that specified the policy and operational framework for pursuing the decade's goals. It also called for actions at the international, regional and national level to reduce disaster vulnerabilities particularly for developing countries<sup>18</sup>.

The main task of IDNDR was hazard mitigation. This was a global programme driven by concerns that rising disaster losses threatened the sustainability of further population growth and wealth creation in developing regions of the world. The main goals set for the Decade were:-

1. To improve the capacity of each country to mitigate the effects of natural disasters particularly of the developing countries, in the establishment of early warning system and preparedness.
2. To develop appropriate guidelines and strategies for applying existing scientific and technical knowledge to natural disaster reduction.
3. To foster scientific and engineering endeavors aimed at closing critical gaps in knowledge.

4. To develop measures for the assessment, prediction, prevention and mitigation of natural disasters through programmes of technical assistance, technology transfer, education and training and support for national planning and research.

It is to be noted that to implement the goals of the IDNDR, the Resolution also established the “International Framework for Action” for IDNDR. At the International level it includes the establishment of a Special High Level Council, a Scientific and Technical Committee and a Secretariat of IDNDR and a Voluntary Trust Fund to guide and implement the strategies adopted for disaster risk reduction. At the National Level the “Framework for Action” envisaged the establishment of National Committees for IDNDR. This was the first initiative that reflected a change in paradigm shift from disaster prevention to disaster recovery and reconstruction<sup>19</sup>.

### ***(II) Disaster Risk Reduction Framework: Earth Summit 1992 and Agenda 21***

The United Nations Conference on Environment and Development (UNCED) commonly referred to as the Earth Summit or Rio Summit 1992 was convened to take forward the agenda of sustainable development<sup>20</sup>. It was the culmination of more than three years of planning and negotiation by governments, international agencies and a wide range of non-governmental “independent sectors” coordinated by a special secretariat of UNCED. The focus of the conference was largely on the changes that must make economic behavior of the states to ensure global sustainability<sup>21</sup>. The most important outcome of the UNCED Conference 1992 was Agenda 21 which refers to a global “Plan of Action” for achieving sustainable development for the twenty first century. To build a comprehensive agenda of sustainability Agenda 21 recognized the importance of disaster and its impact on human life which was jeopardizing their safety and enlargement of threats that requires action in the area of human security<sup>22</sup>.

The Report stated that over the past two decades, natural disasters are estimated to have caused 3 million deaths and affected 800 million people. Global economic losses have been estimated by the office of the UN Disaster Relief Coordination to be in the range of \$30-50 billion a year<sup>23</sup>. As a result the projection of Agenda 21 on the “Basis for Action” on disasters is very significant because natural disasters causes loss of life, disruption of economic activities and urban productivity, particularly for highly susceptible low-income groups and environmental damage. The loss of fertile agricultural land and contamination of water resources and can lead to major resettlement of population reflecting a major threat to security of the people and community concerned.

Agenda 21 Section I, Chapter 7, Group F recognizes natural disaster as threat to human well being particularly for developing countries. The objective was to enable all countries, in particular those that are disaster prone, to mitigate the negative impact of natural and man-made disasters on human settlements, national economies and the environment. This also reflected a change in paradigm or perception shift from disaster prevention to disaster recovery and reconstruction. Under this programme capacity building exercise means working on the three distinct areas of activity as mentioned below<sup>24</sup>.

- (a) To promote a culture of safety especially in those countries which are prone to disasters
- (b) To promote and develop “pre-disaster” planning to reduce vulnerability of human lives and settlements.
- (c) Initiating post-disaster reconstruction and rehabilitation planning in which the international community should ensure that the countries affected get the greatest benefits from funds for sustainable reconstruction and rehabilitation of the affected communities.

Agenda 21 initiated the exercise at the international level of generating a conceptual shift in understanding of disaster from response and recovery to mitigation and preparedness and to build resilience of communities to disasters in the national arena. This exercise generated disaster risk management to be incorporated to build the sustainable agenda. Concrete efforts began to pursue natural disaster as a specific threat to sustainable development and human security that resulted in the culmination of the world conference on disaster risk reduction in 1994.

***(III) The Yokohama Strategy 1994 and Plan of Action for A Safer World: The United Nation First World Conference on Disaster Risk Reduction (WCDRR: 1)***

Under the United Nations institutional arrangement the First World Conference on Natural Disaster Reduction was called upon in Yokohama, Japan in May, 1994. The United Nations members met at the World Conference on Natural Disaster Reduction in Yokohama, Japan to assess the progress attained by the IDNDR. This conference prepared the Yokohama Strategy and Plan of Action for a Safer World<sup>25</sup>. This Document made the international community to adopt concrete strategy to reduce the vulnerability of the vast majority of the world population occurring due to natural disasters and ensure human security. The Plan of Action affirmed that: -

1. The impact of natural disaster in terms of human and economic losses has risen in recent years and societies in general have become more vulnerable to natural disaster. Those usually most affected by natural and other disasters are the poor and socially disadvantaged groups in developing countries as they are least equipped to cope with them.
2. Disaster prevention, mitigation, preparedness and relief are four elements which contribute to and gain from the implementation of sustainable development policies. These elements



along with environmental protection and sustainable development are closely interrelated. Therefore nations should incorporate them in their development plans and ensure efficient follow-up measures at the community, national, sub regional, regional and international levels.

3. Disaster prevention, mitigation and preparedness are better than disaster response in reducing disaster. Hence a comprehensive approach is necessary to integrate disaster management.
4. The world is increasingly interdependent and countries should act in a new spirit of partnership to build a safer world based on common interests and shared responsibilities to save human lives as natural disasters do not respect borders. Regional and international cooperation will significantly enhance the ability to achieve real progress in mitigating disaster through transfer of technology and sharing of information and joint disaster prevention and mitigation activities. Bilateral and multilateral assistance and financial resources should be mobilized to support these efforts.
5. Community involvement and their active participation must be encouraged to gain greater understanding and insight into the individual and collective perception of the development risks involved to reduce impact of disasters.
6. Nations should view the Yokohama Strategy for a safer world as a call to action, individually and in concert with other nations, to implement policies and goals reaffirmed in Yokohama and to use the IDNDR as a catalyst for change.

The participating member states accepted Nine Principle to be applied to disaster management within their own countries. The Tenth and Final Principle formalized the requirement that each nations and government accept responsibility for protecting its people from the consequences of disasters. The Yokohama Strategy was the first systematic exercise on a global scale to address the issue of natural disaster and urged the states for adoption of disaster risk reduction strategies to ensure sustainable development and better preparedness to reduce disaster risks for the security and well being of the people affected by disasters.<sup>26</sup>

#### ***(IV) International Strategy for Disaster Reduction 1999: ISDR 1999***

The International Strategy for Disaster Reduction (ISDR) acted as a successor to IDNDR. The ISDR was formulated to build upon the progress so far achieved under the IDNDR programme to increase awareness to Disaster Risk Reduction (DRR). To further the task of risk reduction the United Nations General Assembly in December, 1999 build the ISDR to help the nations, organizations and communities to become “disaster resilient” so that disaster reduction must be fully interlinked with development. The task of ISDR was to build on the learning from IDNDR, the Yokohama Strategy and Plan of Action and the Geneva Mandate of 1999<sup>27</sup>. To achieve the goals ISDR promoted four objectives tools towards “disaster reduction for all” and these are ----

- Increase public awareness about risk, vulnerability and disaster reduction
- Obtain commitment from public authorities to implement disaster reduction policies and actions. This requires in part, a grass root approach where communities at risk are fully informed and participate in risk initiatives.
- Stimulate interdisciplinary and inter sectoral partnerships, including the expansion of risk reduction networks.

- Improving scientific knowledge about disaster reduction (UNISDR-2001).

The ISDR reflected the commitment of the international community to address disaster as a threat to human wellbeing and development at the level of global governance providing building guidelines for the international institution to take further action in this regard.

***(V) Hyogo Framework for Action (2005–2015): The United Nation Second World Conference on Disaster Risk Reduction (WCDRR: 2)***

Adopted at the backdrop of the devastating Indian Ocean Tsunami 2004 the conference was a concrete attempt to mainstream disaster risk management into national plans and policies. The emergence of risk reduction as an international strategy to reduce disaster risk and vulnerabilities was encapsulated in the UNISDR programme of activity which grew out of the Yokohama Strategy and the UN Decade of IDNDR. This laid the ground work for the second world conference on disaster risk reduction<sup>28</sup>.

The Second World Conference on Disaster Risk Reduction was held in Kobe, Japan in 2005 when one hundred sixty eight nations participated and adopted the Hyogo Framework for Action (HFA) (2005 – 2015): Building Resilience of Nations and Communities to Disasters. The HFA laid down plan outlay for ten years that reflected the intension of the international community to take a more comprehensive and holistic approach to disaster risk reduction<sup>29</sup>. The HFA (2005-2015) was named on the site and ten years after the devastating Kobe Earthquake of 1995. The “Review of the Yokohama Strategy” (2003) provided the basis for the HFA that tried to build upon the gaps indentified by the Review Report. The specific gaps and challenges identified by the Review Report were covering the period from 1994 till 2004. The resulting document reflects

the current state of awareness and accomplishments, limitations and constraints and present strategic observation to strengthen global risk reduction<sup>30</sup>.

The growing understanding and acceptance of the importance of global risk reduction also reflected global commitments towards sustainable development clearly stated in the Johannesburg Plan of Implementation of the World Summit on Sustainable Development (2002) and Agenda 21 especially through its provisions on vulnerability, risk assessment and disaster management and also a target part of achieving Millennium Development Goals with which it is inherently linked<sup>31</sup>. The five areas identified in the review report of the Yokohama Strategy were further built upon in the HFA<sup>32</sup>. These areas were:-

1. Governance – organizational, legal and policy framework
2. Risk identification, assessment, monitoring and early warning system
3. Knowledge, management and education in the field of disaster reduction
4. Reducing underlying risk factors associated with disaster management
5. Preparing for effective response and recovery.

These key areas provided the basis for developing a relevant Framework for Action that culminated into building guidelines to disaster risk reduction covering the next decade. The message that the Kobe Conference generated was that disaster risk reduction needs to be mainstreamed into policy making as disasters are strongly linked to poverty and development. The major outcome was the mechanism to be incorporated at all levels international, regional and national to reduce disaster vulnerabilities. The HFA provided a unique opportunity to promote a strategy and systematic approach to reduce vulnerabilities and risk to hazards. It also identified the need and ways of building the resilience of nations and communities to disasters<sup>33</sup>.

The conference acknowledged that efforts to reduce disaster risks must be systematically integrated into policies, plans and programmes for sustainable development and poverty reduction and supported through bilateral, regional and international cooperation including partnerships. Sustainable development, poverty reduction, good governance and disaster risk reduction are mutually supportive objectives and in order to meet the challenges ahead, accelerated efforts must be made to build the necessary capacities at the community and national levels to manage and reduce risks. It further stated that such an approach is necessary to be recognized as an important element for the achievement of internationally agreed development goals including the MDGs (2000)<sup>34</sup>.

The HFA is a “global blueprint for disaster risk reduction” for the next decade. The goal set for the next decade is to substantially reduce disaster losses by 2015 in the social, economic and environmental assets of communities and countries affected by disasters. The HFA identified three strategic goals and five priorities for action in order to achieve the stated goals<sup>35</sup>.

***(a) Three Strategic Goals of HFA***

- (1) The integration of disaster risk reduction into sustainable development policies, planning and programmes at all levels with special emphasis on disaster prevention, mitigation, preparedness and vulnerability reduction.
- (2) The development and strengthening of institutions, mechanism and capacities at all levels, particularly at the community level, so as to systematically build resilience to hazards.
- (3) The systematic incorporation of risk reduction approaches into the implementation of emergency preparedness, response and recover programmes of affected communities

(b) ***Five Principles for Action of HFA:*** The HFA framework emphasized on 5 priorities for action:

- (1) Ensure that disaster risk reduction is a national and local priority with a strong institutional basis for implementation.
- (2) Identify, assess and monitor disaster risks and enhance early warning system.
- (3) Use knowledge, innovation and education to build a culture of safety and resilience at all levels.
- (4) Reduce the underlying risk factors associated with social, economic and environmental conditions.
- (5) Strengthen disaster preparedness for effective response at all levels.

In this context it is vital to note that while placing the primary responsibility for achieving resilience rests on national governments, the HFA equally places importance on the following sectors:

- (1) Increased coordination at the national, regional and international levels.
- (2) Integration of Disaster Risk Reduction (DRR) into other relevant international initiatives taking into account the MDGs.
- (3) Building strong regional capacities
- (4) Participation by civil society, NGOs, community organizations and voluntary groups as well as the involvement of the scientific community.
- (5) Mainstreaming DRR measures into multilateral and bilateral development assistance programmes.
- (6) The provision of adequate funding for the DRR work especially for the UN Trust Fund for Disaster Reduction.

The implementation of HFA should be addressed by different stake holders in a multi sectoral approach including the states and regional and international organizations. The UN and international financial institutions are called upon to integrate DRR considerations into the sustainable development policy, planning and programme at all levels<sup>36</sup>. The HFA signified the global commitment to reduce disaster risks to build resilient communities as recurring disaster events have put human security and development at risk. The HFA has been an important mechanism that generated various instruments and policies at international, regional and national level to build upon disaster risk reduction. The Hyogo Framework has generated international mechanism such as the Global Platform for strategic advice, cooperation, coordination and partnership for disaster risk reduction as well as regional platforms that has been crucial in generating policies and strategies for advancement of knowledge.

***(VI) Sendai Framework for Disaster Risk Reduction (2015–2030): Towards A Post 2015 International Framework for Action for Disaster Risk Reduction. The United Nations Third World Conference on Disaster Risk Reduction (WCDRR: 3)***

To address the Post 2015 Framework for Action and build the strategy in managing global disaster risks the international community met in March, 2015 in the Tsunami impacted city of Sendai to mainstream and strengthen DRR in national policies. The Third World Conference on Disaster Risk Reduction (WCDRR3) was to comprehend the ten years of preparation in disaster risk management and capacity building following the HFA to develop a global framework for action<sup>37</sup>. The Sendai Framework (2015-2030) has been adopted for a period of fifteen years.

The Post-2015 framework was called upon by United Nations General Assembly Resolution 66/199 that released a document entitled “Suggested Elements for the Post-2015 Framework for

Disaster Risk Reduction” that called to address the structure and context of the Framework to be developed and released for the March, 2015 WCDRR 3<sup>38</sup>. The Document 66/199 proposed several recommendations for the new framework out of which three targets have been identified to be raised for coming years to reduce disaster vulnerabilities. These are:

- Reducing disaster mortality by 2025 (by a given %)
- Reducing disaster economic loss by 2025 (by a given %)
- Reducing disaster damage to housing, educational and health facilities by 2015 (by a given %)

The purpose of the future framework is to guide and build upon the earlier advancements to manage disaster and climate risk and to address the issue of sustainable development and human security. The framework proposes to work in the direction of achieving the targets that the international community has set for itself in the management of disaster reduction. The Global Assessment Report (2015) presented at the conference highlighted the fact that though some progress has been made in disaster management but little progress in addressing disaster risk also being enhance due to climate change. Hence a new paradigm of disaster risk reduction has to be placed at the core of the development process. The member states reiterated their commitment to address disaster reduction with a renewed sense of urgency in the context of sustainable development and poverty eradication and appropriate policies, plans and programmes to be integrated within relevant framework. Particularly India called for international cooperation in support of a Post-2015 Framework<sup>39</sup>.

The Sendai Conference further acknowledged the fact that within the same period of ten years (2005-2015) disasters have continued to affect people, communities and countries as a whole.



This once again requires a broad and “people centered” approach to disaster risk particularly focusing on underlying disaster risks such as poverty and inequality, climate change, unplanned rapid urbanization, poor land management, weak institutional arrangements, lack of regulations, impact of demographic change, limited availability of technology, unsustainable use of natural resources, declining ecosystems and epidemics<sup>40</sup>. The Conference recommended the strengthening of good governance in disaster risk reduction and to “Build Back Better” (BBB) i.e. post recovery and reconstruction programmes at the national, regional and global levels for the implementation of this framework by 2030.

The WCDRR at Sendai also advocated for the first a “World Vision” especially focusing on children’s participation in disaster risk reduction “What Resilient Future Children Want” – which includes, children’s participation, establishing and reinforcing child protection legislation, making schools safe from disasters, ensuring that all children, especially the most vulnerable have access to quality services while taking up risk-informed development planning<sup>41</sup>. The United Nations Office of UNISDR is to support the implementation and review of this framework periodically with the help of Global Platform to develop coherent global and regional relevant mechanism for sustainable development and timely updating the HFA Monitor, actively participating in the work of Inter-Agency and Expert Group on sustainable development indicators, providing technical guidance and information to strengthen DRR framework till 2030<sup>42</sup>.

### ***Institutional Mechanisms to Implement Disaster Reduction Strategies of U.N***

This expanding role of the United Nations for disaster assistance and humanitarian relief operation has been set by the UN General Assembly Resolution 46/182 (December 17, 1991).

This coordinating Resolution included provisions on prevention that called on the international community to provide the necessary support and resources to prevent humanitarian tragedies from happening and also to put more emphasis on preparedness including early warning information on natural disasters and other emergencies<sup>43</sup>. The member states had called upon to make the UN system stronger and efficient so as to improve the UN system to meet urgent humanitarian needs in times of emergencies but these changes most of the times as Thomas. G. Weiss points out have been more structural in nature<sup>44</sup>.

I. At present with the creation and establishment of Office for the Coordination of Humanitarian Affairs (OCHA) (was reorganized with its merger in 1998 with UN Disaster Relief Coordinator office) and the Emergency Relief Coordinator (ERC) serve as the major institutional measures adopted for a more coherent coordinated approach for humanitarian assistance in emergency relief operations. After merger its mandate was expanded to encompass the coordination of humanitarian response, policy development and humanitarian advocacy. The agency's activities include organization and monitoring of humanitarian assistance and funding, information exchange, coordination and sending rapid response team for emergency relief<sup>45</sup>.

***(a) Office for the Coordination of Humanitarian Affairs (OCHA)***

The institutional mechanism carrying out the task of emergency assistance under the umbrella of United Nations is the Office for the Coordination of Humanitarian Affairs (OCHA). It is to be noted that earlier United Nations work on emergency assistance (for conflict, civil war, including natural disasters) was guided more by relief assistance approach rather than pro-active assistance particularly for disaster risk reduction strategies. It is to be noted that earlier this was recognized

as emergency assistance by the United Nations. This emergency assistance work was carried by the United Nations Disaster Relief Office<sup>46</sup>.

In 1992, the United Nations Department of Humanitarian Affairs incorporated the United Nations Disaster Relief Office (UNDRO). This office was created to coordinate international humanitarian relief operations. In 1998, (January) the department was restructured and renamed as the Office for the Coordination of Humanitarian Affairs (OCHA). The OCHA is headed by an Under Secretary General who serves as Emergency Relief Coordinator (ERC) responsible for coordinating disaster relief both within and outside the United Nations system. The ERC has been mandated by the UN for the responsibility of coordinating the rapid deployment of staff during crisis situations and ensuring that appropriate mechanism are undertaken for disaster relief and coordination. This was also associated with different departments and organs of United Nations in disaster assistance and also extending to the states responsibilities to neighboring states as well<sup>47</sup>.

***(b) The Emergency Relief Coordinator (ERC)***

The Emergency Relief Coordinator (ERC) is the main institutional mechanism to guide, steer and coordinate humanitarian assistance and policy advocacy. The ERC is the Chairman of Inter-Agency Standing Committee (IASC) which included major UN and non UN humanitarian agencies, to facilitate interagency analysis and decision making to respond to humanitarian emergencies. The Executive Committee for Humanitarian Affairs (ECHA) serves as a cabinet level forum for coordinating policies within UN. The Head of OCHA, who is also the Chief of ERC as the Under Secretary General is also the Convener of ECHA. As a result better coordination is possible at all levels of institutional arrangement<sup>48</sup>.

OCHA demonstrated a well coordinated response in the aftermath of 2004 South East Asian Tsunami which killed approximately 2,75,000 people and left tens of millions homeless without basic amenities. It was one of the biggest relief operations in UN history conducted by the OCHA<sup>49</sup>. This coordinated response of OCHA was also reflected during the Kashmir Region earthquake 2005, which left 30,000 people dead and millions homeless<sup>50</sup>.

**II.** In January 2000 the General Assembly through its Resolution/No/54/219 established two institutional mechanisms for the implementation of ISDR. **These two institutional mechanisms are the Inter-Agency Secretariat for ISDR (IAS/UN/ISDR) and the Inter-Agency Task Force on Disaster Reduction<sup>51</sup>.**

*(a) The Inter-Agency Secretariat for ISDR (IAS/UN/ISDR)* is the main institutional mechanism within the United Nations system that co-ordinates strategies and programmes for disaster reduction and ensures coordination between disaster reduction activities with those in socio-economic and humanitarian fields. The Secretariat acts as a facilitating agency to bring different organizations and disciplines together by providing a common platform to work for Disaster Risk Reduction. The other areas of coordination includes<sup>52</sup>

- It also acts as an international agency for the management and dissemination of information on current status of disaster reduction through publication of Global Review of disaster reduction initiative.
- It develops activities such as campaigns to promote wider understanding about natural hazards and its reduction.
- Another important task is to encourage both policy and awareness to be mainstreamed in the national policies of the countries and working in close association with regional initiatives.

- An outreach programme has been established in Latin America and the Caribbean and to collaborate with other regional institutions Africa, Asia and the Pacific regions.
- The main task of the secretariat is to support the Inter-Agency Task Force (IATF) for the development of policies on natural disaster reduction.

***(b) The Inter-Agency Task Force on Disaster Reduction (IATF/DR)***

The Task Force was established in 2000 as the main forum to devise strategies and policies for the reduction of natural hazards. It was also entrusted to look into the lacunae of earlier policies and recommend remedial action to be coordinated with different agencies of the United Nations involved in disaster reduction. The IATF/DR is chaired by the Under Secretary General (USG) for Humanitarian Affairs and is composed of fourteen representatives of agencies and organization of the UN System. Also eight representatives each from regional entities and of civil society and relevant professional sectors join the task force. The Director of ISDR acts as the Secretary of the Task Force. The Task Force has established four Working Groups to work on climate variability, early warning, risk analysis and wild land fires. Additional areas of actions such as drought, ecosystem management, land use planning. Integrating DRR issues into sustainable development and national planning agendas were incorporated to broaden the base of activity of IATF/DR<sup>53</sup>.

***III. Other International Agencies, Inter Governmental Organizations, Multilateral Financial Institutions and Non Governmental Organizations associated with Disaster Risk Reduction***

It is to be noted that a number of agencies of the United Nations and intergovernmental organizations are engaged in global disaster reduction framework. The OCHA carries out relief coordination and mitigation in collaboration with other agencies of United Nations such as the UNHCR, UNICEF, FAO, WHO, WMO and others with active participation of international non-

governmental organizations to carry such a massive task of humanitarian assistance in times of crisis. These agencies are also cooperating in the area of disaster risk reduction. The UN agencies which exhibit a serious protracted concern in the field of disaster risk reduction which include UNESCO, UNICEF, FAO, WFP, WHO, WMO to mention a few. Multilateral financial institutions like the World Bank Group funds disaster relief assistance programmes as well as various non-governmental organizations like the Red Cross and Red Crescent work in the field of humanitarian assistance in disaster situations<sup>54</sup>. The agencies involved in disaster assistance are briefly addressed below:-

***i.) United Nations Educational, Scientific and Cultural Organization (UNESCO)***

UNESCO has been engaged in assessment and mitigation of risks associated with natural hazard. This action is carried out through networking strengthening of regional and international coordinating systems, direct partnership with member countries, field implementation and dissemination of data, seminars, training courses and advisory missions. Since the 1960's UNESCO has been playing an effective role in constructing global culture of disaster preparedness and mitigation through education and information programmes pursued systematically<sup>55</sup>. UNESCO has supported the establishment of international, regional and national centres for recording, exchange and analysis of seismological data, such as the specialized earthquake engineering and seismology in former Yugoslavia, Britain, Japan, Peru, Iran and other earthquake vulnerable zones in the world. At regional level since 1993, UNESCO in collaboration with US Geological Survey is part of a programme for Reducing Earthquake losses in the Eastern Mediterranean region and since 2001, reducing losses in South Asia. Since the Kobe, Japan earthquake of 1995 which caused economic losses of more than US \$100

billion, making it far the costliest natural catastrophe of all times, UNESCO has been supporting the development and implementation of quake resistant buildings codes programmes<sup>56</sup>.

Moreover, the Indian Ocean Tsunami (December, 2004) resulted in the Meeting of All Member States at Kobe resulted in setting up an early warning system for the India Ocean with the help from the Pacific Tsunami Warning Centre in Hawaii and the Japanese Meteorological Agency. Moreover all the member states of the Intergovernmental Oceanographic Commission of UNESCO in 2005 decided to coordinate the establishment of a global warning system for Ocean related hazards in close cooperation with other UN bodies<sup>57</sup>.

UNESCO is also associated with various programmes related to flood disasters where the task is to reduce human vulnerability to flooding. As the UN's leading agency for water related issue, the World Meteorological Organization (WMO) in collaboration with UNESCO has been working on International Flood Initiative since 1998. Since the publication of Report of 2001 Intergovernmental Panel on Climate Change (IPCC), global warming has become an emergent issue to be addressed by all UN agencies. Climate change has become a priority for many UNESCO programmes such as the World Climate Research Programme, Drylands and Desertification Programmes and the Global Coral Reef Monitoring Programme<sup>58</sup>.

#### ***ii.) United Nations Children's Emergency Fund (UNICEF)***

UNICEF founded in 1946, provides children and families with support both material and information, nutritional, healthcare, water sanitation, learning spaces, protection services and shelter with the help of international funding wherever emergency or disaster strikes. Being guided by the convention on the rights of the child, UNICEF has been associated with various

programmes to strengthen its core humanitarian policy to uphold the rights of the children and women in crisis<sup>59</sup>. According to the UNICEF Report 2011 - “Humanitarian Action for Children; building resilience” – it has expanded its functions of the Core Committee for children in emergencies to widen its scope as the Core Committee for Humanitarian Action including disaster preparedness, mitigation and disaster risk reduction working closely during 2010 earthquake in Haiti and flooding in Pakistan<sup>60</sup>.

UNICEF works in close cooperation with national governments and civil society to deliver its programmes in nutrition, health, water sanitation and hygiene (WASH), child protection, education and protection from civil war and violence. According to the UNICEF Report 2013 “Humanitarian Action for children: United for Children”: Overview Document<sup>61</sup> states that UNICEF in 2012 provided for treatment of 2 million children for severe and moderate malnutrition, 38.3 million children were immunized, 12.4 million people were provided with access to safe water and sanitation, 3 million children were provided with access to improved education, 1 million people were provided with HIV/AIDS and other health related services.

### ***iii.) Food and Agriculture Organization (FAO)***

One of the objective of FAO is to strengthen disaster risk reduction by strengthening the capacities of the communities to prepare for natural disasters. It deals with immediate issues such as food, improved cropping systems, sustainable water management and plays important role in reversing degradation and reducing vulnerability to hazards.

It also supports special programmes for food security and for this the UN World Food Programme is focused on emergency and post disaster food relief and rehabilitation to



communities affected by disasters. FAO plays a key role in integrating DRR measures in agriculture and food policies of member countries<sup>62</sup>. In this context it is worth mentioning that FAO launched the World Food Programme (**WFP**) after the 1960's conference to eradicate world hunger and malnutrition to save lives and protect livelihood in emergencies. Over the last ten years WFP's activities focus more to emergency operations. According to WFP's approximate expenditure 80% of the amount is spent on emergency services. In 2011 about 11 million malnutrition children received special nutritional support<sup>63</sup>.

**WFP** plays an important role on emphasizing early warning and contingency planning with the help of WFP's vulnerability and Analysis and Mapping Project (VAM). WFP has the main role in assessing, coordinating and delivering assistance to the affected areas arising out of political conflict or disasters or other emergencies. Even WFP works in assistance with national governments to support its programme including South Asian countries like Nepal, Bangladesh and the rest of the countries in the region concerned whenever such emergencies arises<sup>64</sup>.

#### *iv.) The World Meteorological Organization (WMO)*

This organization generally coordinates global scientific activity to provide advance warnings that may save lives and reduce damage to property and the environment. WMO deals with hazards related to water, climate and weather which accounts for nearly 90% of all natural disasters. WMO has contributed to reduce the impacts of natural disasters as well as human induced disasters with effective early warning system. With the emergence of new technologies for disaster warning an integrated warning programme could bring about an effective warning and monitoring system facilitates the mitigation impacts of disaster<sup>65</sup>.

**v.) World Health Organization (WHO)**

The WHO deals with disaster preparedness connected with health. Its purpose is to reduce avoidable loss of life and the burden of diseases and disability in disaster affected countries. It works with other international organizations and non-governmental organizations as well as local authorities and civil society in responding to health emergencies, rapid health assessment and sectoral response coordination. The focus of WHO programme remains on the developing countries to prepare them to adjust to emergencies and introduce effective preventive measures to mitigate the threats arising from disaster situation<sup>66</sup>.

In this context mention is also to be made of the ***International Federation of the Red Cross and Red Crescent societies (IFRC/RC)*** whose purpose is to prevent and alleviate human suffering, to protect life and health and ensure human dignity and wellbeing. IFRC collaborates with the National Red Cross and Red Crescent Societies to coordinate emergency responses and development activities. All natural and technological disasters as well as outbreak of conflicts related to emergencies, the IFRC assists in emergency situations. It also assists in post conflict situations. IFRC collaborates with regional and national societies to create effective preparedness capacities. Particularly the IFRC also brings out yearly World Disasters Reports creating awareness, knowledge dissemination and reporting on various disasters affecting the people world wide<sup>67</sup> A large number of international non-governmental organizations (NGOs) such as the **Oxfam, CARE, Save the Children, Islamic Relief, Muslim Aid** and others have stepped up their activities regarding disaster relief and disaster assistance. Cyclone Sidr that hit Bangladesh in November, 2007 has seen to collaboration of Government of Bangladesh with UN Agencies,

the National Red Crescent Society, IFRC and other national and international agencies assisting humanitarian activities in the affected area<sup>68</sup>.

In this context it is pertinent to note that the size and diversity of the international disaster relief community comprising of international agencies, non-governmental organizations and civil society has been growing enormously. Earlier the Red Cross and Red Crescent Societies, with the help of few voluntary organization and domestic support assisted in humanitarian relief assistance. In the last few decades, United Nations agencies, a number of international NGOs and other institutions have exploded in the field of disaster assistance as was seen in the aftermath of India Ocean Tsunami of 2004. This has led David Fisher to comment that international disaster relief has now become “the world’s largest unregulated industry”<sup>69</sup>.

In a similar vein R.C. Kent mentions that earlier disaster relief was not regarded as a major concern for the international community. In the present scenario humanitarian affairs have become big international business occupying the attention of more bilateral, multilateral and international-NGOs to address the relative growth industry of disaster assistance<sup>70</sup>. This brings the focus more on disaster relief and rehabilitation rather on disaster mitigation and preparedness which is the ultimate goal of disaster management.

The existing institutional mechanisms at the international level for disaster risk reduction and management reveals that these have a profound impact on the functioning of institutions and mechanisms at regional and national level exercise for disaster risk reduction. As such the focus of study shifts to understanding regional mechanisms for mitigation and management of the natural disasters in the region of South Asia, which is the main thrust area of this particular

study. This brings logically to the next part of the discussion to address the regional exercises for disaster risk reduction in South Asia.

### ***Regional Exercises to Address Disaster Risk Reduction and Management in South Asia***

The rising frequency and intensity of disasters in the region of South Asia has made the countries concerned to enter into regional cooperation regimes to address the issue of disaster risk reduction and mainstreaming of disaster risk mitigation into national plans and policies. Several initiatives have been undertaken in recent years to institutionalize and adopt mechanisms at the regional level to mitigate disaster risk. The South Asian Association for Regional Cooperation (SAARC) has proved to be the fundamental institutional mechanism to undertake the initiative in the South Asian region.

SAARC was established by the Dacca Declaration of 1985 to promote regional cooperation among the countries of the region which included Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and Afghanistan joining in 2005<sup>71</sup>. The members of SAARC have reiterated at various Summit Meetings to strengthen and intensify regional cooperation to preserve, protect and manage the diverse and fragile eco-system of the region including the need to address natural disasters and challenges recently growing out of climate change. The preservation and protection of the environment including disaster risk reduction and management remains a high priority on the agenda of cooperation among the members of SAARC. The various SAARC Summits, the meetings of the SAARC Environment Ministers and The Technical Committee on Environment and Forestry provides the key mechanisms to intensify regional cooperation in areas of environment, natural disaster and climate change<sup>72</sup>.

### *Institutional Mechanisms to Implement Disaster Risk Reduction Strategies of SAARC*

**(a) SAARC Environment Ministers Meetings:** The meetings of the SAARC Environment Ministers take place periodically to examine the progress made in the areas of cooperation particularly on environment, natural disaster and climate change. Since 1992, it has met nine times to review and recommend further plan of action. In addition two landmark Special Sessions were conducted<sup>73</sup> in the aftermath of Indian Ocean Tsunami (Male, July 2005) and; SAARC Ministerial Meeting on Climate Change (Dhaka, July 2008), to further strengthen the existing mechanisms to address emergent issues.

To further strengthen the mechanisms regarding protection of Environment and Development various SAARC Environment Ministers Conference has been commenced periodically by SAARC to deeply study the issues and concerns related to environment, natural disaster, climate change, forestry and associated problems of poverty and development<sup>74</sup>. The First SAARC Environment Ministers Conference was held in New Delhi (8-9) April 1992 that addressed issues aligned with the United Nations Conference on Environment and Development at Rio in 1992. Also to adhere to international mechanisms similar efforts led to the establishment of a Technical Committee on Environment in 1992 to coordinate regional cooperation in environmental related concerns and issues<sup>75</sup>. The Male Declaration adopted at the Ninth SAARC Summit held in Male, Colombo (12<sup>th</sup> May) 1997, laid the framework for action to be taken regarding environment and disaster mitigation. The Major initiative taken by members of SAARC was the formulation of **SAARC Action Plan on Environment** adopted at the Third Meeting of the Environment Minister's (Male, 1997) based on the recommendations of the earlier two Regional Studies as<sup>76</sup>.

Earlier the Third SAARC Summit held in Kathmandu in 1987 commissioned a study for the protection and preservation of the environment and causes and consequences of natural disaster. The study was completed in 1991 and the main recommendations were endorsed in the Sixth Summit in Colombo 1991. The two regional studies firstly “Causes and Consequences of Natural Disasters and the Protection and Preservation of the Environment”; and secondly “Greenhouse Effect and its Impact on the Region” laid the framework of environmental protection and preservation in the region<sup>77</sup>. The main recommendation outlined in the study was

1. Measures to protect and manage the environment and:
2. Measures and programme to strengthened disaster management capabilities.

The SAARC Action Plan implementation responsibility rests with the member states by preparing a National Plan on Environment that shall be later coordinated on the basis of various Reports of the member states on the status of Environment, the parameters and modalities of further cooperation to highlight a feasibility study on the Regional Treaty on Environment in the context of existing international conventions and mechanisms<sup>78</sup>.

This cooperation was further strengthened following Colombo Declaration (30 October – 01 November) in 1998 for a Common Environment Programme adopted at the Fourth SAARC Environment Ministers Conference. The Programme was initiated to further enhance cooperation of sharing information and technical assistance and setting up scientific and technological institutions in the region. This laid the ground work for regional centres to constituted on these various matters of common concern<sup>79</sup>.

**(b) SAARC Technical Committee on Environment:** In addition another important mechanism to implement various decisions undertaken by SAARC members is the Technical Committee on

Environment. First established in 1992 the Committee was mandated to examine the recommendations and monitor the progress of the Regional study commissioned earlier by the Third SAARC Summit (Kathmandu, 1987) on “The Protection and Preservation of the Environment and Causes and Consequences of Natural Disasters” as well as another study directed by The Fourth SAARC Summit (Islamabad, 1988) on the “Greenhouse Effect and its impact on the Region”. The sectoral mandate of the Committee was expanded to include meteorology and forestry<sup>80</sup>. The Technical Committee also coordinates and monitors the implementation of the SAARC Environment Action Plan (1997) and SAARC Action Plan on Climate Change (2008). Particularly the Special Male Session (2005) adopted the Male Declaration decided that an Expert Group of member countries shall meet at Dhaka, Bangladesh to formulate a Comprehensive Framework on Early warning, Disaster Management and Disaster Prevention for the South Asian Region<sup>81</sup>.

**(c) SAARC Summits:** In its various SAARC Summits the member countries voiced their concern for environment and natural disasters and its devastating impact on the region and particularly the Third SAARC Summit in 1987, Kathmandu, Nepal recognized for the first time the devastating effects and consequences of natural disaster and degradation of environment and called for member countries to develop strategies and policies to be implemented for poverty alleviation and sustainable development of the region<sup>82</sup>.

The Third SAARC Summit was the first institutional response that addressed the issue of natural disaster and environmental security of the region. A Study was commissioned for the Protection and Preservation of the Environment and Causes and Consequences of Natural Disaster and prepared a comprehensive framework accordingly. A Group of Experts from all the members of

the SAARC countries was constituted to prepare the study, which was completed in 1991. The main recommendations were endorsed by the Head of States of SAARC countries at the Sixth Summit Meeting at Colombo in 1991<sup>83</sup>.

Furthering the agenda of environmental security in the region, the Fourth SAARC Summit held in Islamabad in 1988 stressed the need to enhance regional cooperation for strengthening disaster management capabilities as it recognized with serious concern the extensive damage caused in many SAARC countries to unprecedented floods, cyclones and earthquakes and its disastrous impact on the socio-economic structures of the region. Another important Regional Study was conducted on Greenhouse Effect and its Impact on the Region that would provide the basis for an action plan for meaningful cooperation among member states<sup>84</sup>. The study recommended the following components: Regional measures in sharing experiences, scientific capabilities and information on climate change; and global collaboration in monitoring climatology, sea level rise, natural disaster and technology transferred finance. The study which was finalized in 1992 by a group of experts was endorsed at the Seventh SAARC Summit in Dhaka in 1993. The Heads of the State recognized that the study was a significant step in promoting disaster management regional cooperation in this vital area.

***SAARC Comprehensive Framework on Disaster Management and Disaster Prevention (2006-2015)***

In this context it is pertinent to take into account that the Male Declaration 2005 in the aftermath of Indian Ocean Tsunami laid the foundation for developing a Comprehensive Framework on Disaster Management in the South Asian Region (2006-2015)<sup>85</sup>. The Framework articulated and is also aligned with the implementation of Hyogo Framework for Action (2005-2015). The



international mechanism for mainstreaming disaster risk reduction was also applied at the regional level of SAARC. A special session of the SAARC Environment Ministers was held at Male, Maldives on 25<sup>th</sup> June, 2005, that expressed deep concern for unprecedented loss of life and property in the South Asian Region. The Ministers had concluded the meeting by adopting the Male Declaration which decided that an Expert Group of member countries shall meet at Dhaka (7-9) February, 2006 to formulate a Comprehensive Framework on Early warning Disaster Management and Disaster Prevention prior to the Seventh Ministerial Meeting on Environment at Dhaka. The Framework was approved by the SAARC Council of Ministers on 30<sup>th</sup> July, 2006 and finally by the Fourteenth SAARC Summit held in New Delhi (3-4) April, 2007.

The SAARC Comprehensive Disaster Framework provides a platform for South Asian countries to mainstream disaster risk reduction in their national policies so as to build resilience of the society towards disasters. The priorities for Actions and objectives were outlined in a detailed framework of objectives, outcomes and strategic goals to be pursued for disaster risk reduction. The basic objective to be pursued through this framework was broad in its initiative to integrate international (Hyogo Framework 2005) strategies and policies to bring desired outcome<sup>86</sup>. The issue areas covered by the SAARC Comprehensive Disaster Framework are:

- To establish and strengthen regional disaster management system to reduce risks and to improve response and recovery at all levels.
- To identify and elaborate country and regional priorities for action.
- Share best practices and lessons learnt from disaster risk reduction efforts at national levels.

- To establish a regional system to develop and implement regional programmes and projects for early warning.
- To establish a regional system of enlarging information on prevention, preparedness and management of natural disasters.
- To create a regional response mechanism dedicated to disaster preparedness, emergency relief and rehabilitation to ensure immediate response and
- Create a regional mechanism to facilitate monitoring and evaluation of achievements towards goals and strategies.

To pursue strategic goals for disaster risk reduction the framework identified the following areas of action:-

- Mainstreaming disaster risk reduction in national policy making
- Strengthening of community institutional mechanisms
- Empowering community at risk particularly women, the poor and the disadvantaged.
- Risk reduction should be a multi sectoral and multi hazards approach.
- Strengthening emergency response system
- Developing and strengthening networks of relevant national, regional and international organizations.

### ***Institutional Mechanisms to Implement the SAARC Comprehensive Disaster Framework***

The implementation of the SAARC Comprehensive Disaster Framework requires a multi sectoral approach that not only identifies the major responsibility lying with the member states to integrate disaster risk reduction considerations into their sustainable development policies, planning and programmes. It also calls for the inclusion of civil society, including volunteers and community based organizations, the scientific community and the private sector for supporting

the implementation of the programme. The regional centres have been established to address the concern of environment, natural disaster and climate change<sup>87</sup>.

**(I) Regional Disaster Management Centres:** The implementation of the Framework within the context of regional cooperation as mandated to the respective Regional Centres will work in accordance with the SAARC Charter. These Regional Centres of cooperations have been established that constitute an important framework of SAARC institutions to address the concerns of environment, natural disaster and climate change. The important Regional Centres are (a) SAARC Coastal Zone Management Centre (Male) and (b) SAARC Meteorological Research Centre (Dhaka) (c) SAARC Forestry Centre (SFC in 2007) and (d) SAARC Centre for Disaster Management and Preparedness (New Delhi) will implement the SAARC Framework on disaster risk reduction

**(a) The SAARC Coastal Zone Management Centre (SZMC)** was established at Male, Maldives in June, 2005, already the proposal for such a centre was adopted at the Fifth Environment Ministers Meeting at Thimpu (10-11) August, 2002, to promote planning, management and sustainable development of the Coastal Zones and capacity building for integration of disaster risk reduction of the coastal areas.

**(b) SAARC Meteorological Research Centre (SMRC)** was established at Dhaka, Bangladesh in January, 1995 to carry out research on weather prediction and better understanding of climate related issues and to provide information for flood and cyclone forecasting in the region.

**(c) SAARC Forestry Centre (SFC in 2007)** was set up in 2007 for the protection and conservation of forests, prudent use of the forest resources by adopting sustainable forest

management practices to promote the agenda of sustainable development in the South Asian region.

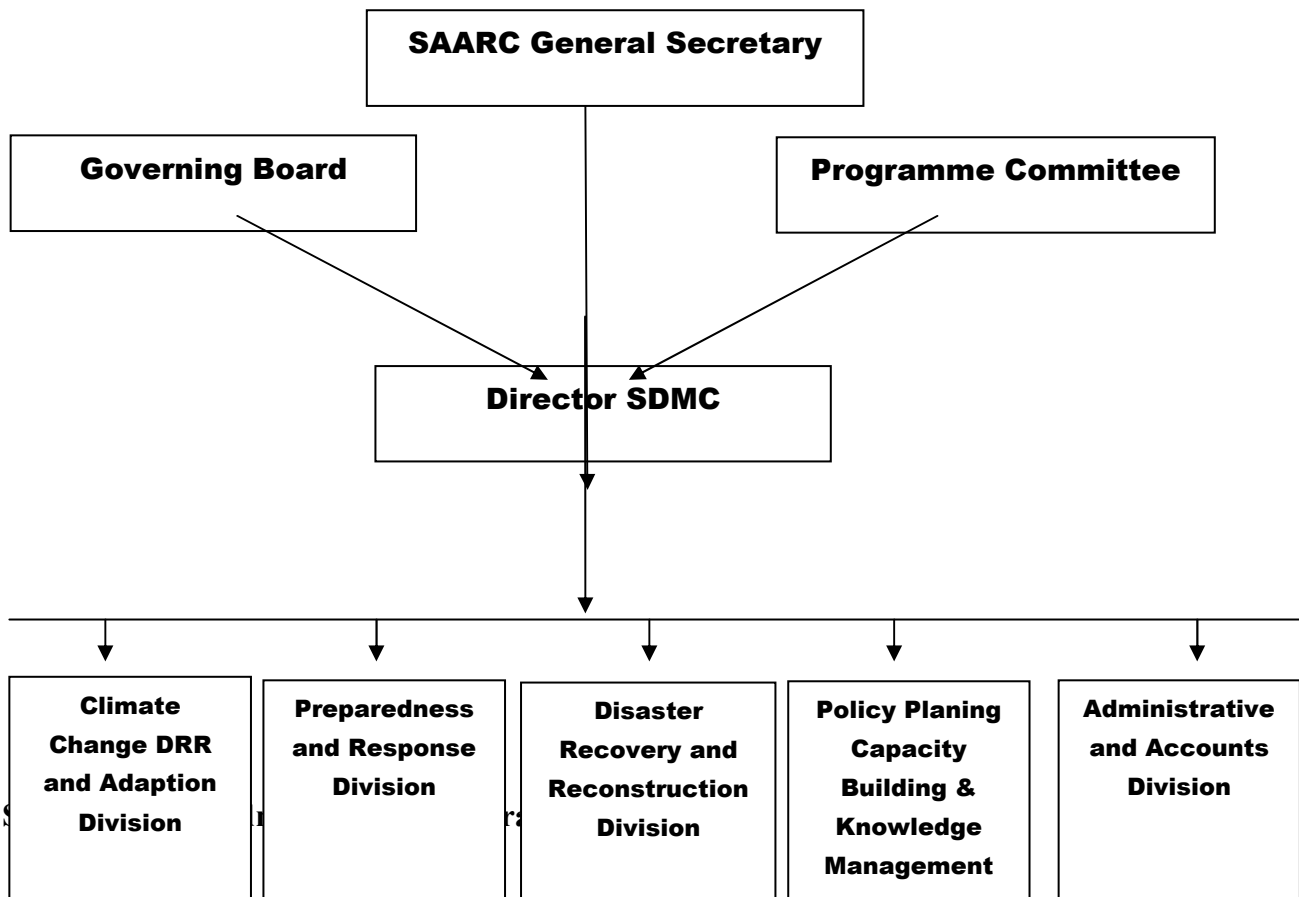
**(d) SAARC Disaster Management Centre (SDMC):** The mechanism to integrate disaster risk reduction strategies at the regional level was adopted with the establishment of SAARC Disaster Management Centre at New Delhi in 2006 (SDMC) to coordinate among all the SAARC members for considering the issues of regional cooperation for preparedness and mitigation of natural disasters<sup>88</sup>. Moreover the functions of the SDMC was to provide member countries policy advice and facilitating capacity building services including strategic learning, research, training, system development expertise, promotion and exchange of information for effective disaster risk reduction and management.

Particularly it advocated the creation of National Focal Centres<sup>89</sup> that would (for each member country) network with the SDMC for engaging in dissemination of knowledge on various aspects of disaster risk reduction in the region of South Asia. The following diagrammatic representation of the organizational structure of SDMC explains the institutional – functional relationship to exercise disaster management framework in South Asia.

#### ***Organizational Structure of SAARC Disaster Management Centre***

The organizational structure of SAARC Disaster Management centre works in networking strategies among the member states. The organizational structure comprises of 5 Divisions out of which 4 are Technical divisions and one Administrative Division<sup>90</sup>. See Fig. 2.1

*Fig. 2.1 Organizational Structure of SAARC Disaster Management Centre*



Source: Ref: [http:// www.saarc-sdmc-nic.in/organogram.asp](http://www.saarc-sdmc-nic.in/organogram.asp) [Accessed on 15 February, 2015 at 12.54 p.m.]

(a) The Administrative Division of SDMC comprises of:

(i). The Secretary General of SAARC which is the topmost administrative body.

(ii) The Chairman/Director of the SDMC. The chair rotates among the member states alphabetically and the Secretary of the Ministry of Disaster Management of that particular Member Countries occupies the chair. The Director of Centre serves as the ex-officio Member Secretary of the Governing Board.

(iii) The Governing Board:-The Governing Board of SDMC comprises of the representative of all eight Member states besides a representative of Secretary General and the Ministry of

External Affairs, India. The Governing Board approves the policy decision of the centre and finalizes its programme, activities and budgets.

(b) The Technical Divisions of SDMC are as follows:

(i) Climate Change, Disaster Risk Reduction and Adaptation Division:-This division is entrusted with the work of creating a culture of preparedness and risk reduction with a multi-hazard approach through quality research, documentation and training across various stakeholders and institutions. The centre also guides and provides services to member states in developing strategies for integration of climate change and Disaster Risk Reduction.

(ii) Preparedness and Response Division:-This Division is dedicated towards building professionalism in responding to disaster situations by cutting down response time by building efficient and effective systems. The division will work towards coordinating regional response mechanism among member states and also with other regional partners. The SMDC will coordinate emergency response under the aegis of SAARC Secretariat.

(iii) Disaster Recovery and Reconstruction Division:- This division will help government and institutions of the member states in formulating and implementing of reconstruction guidelines, techniques and strategies for damage assessment, reconstruction and recovery with specific reference to structural and non structural measures and livelihoods. It will also help in developing regional Disaster Recovery Framework and implementation of its programme.

(iv) Policy, Planning, Capacity Development and Knowledge Management Division: This division is working on policy research along with the related sectors. Independent research will also be carried cutting across various issues (Gender, development planning, organizational

planning, insurance etc.) related to disaster risk reduction. The division is also linked with international networks such as Prevention Consortium, Relief web and Global Disaster Information Network. It will also work as a knowledge management centre for organizing, publishing and disseminating knowledge related to disaster reduction

(v) National Focal Points for Disaster Risk Reduction and Coordination with SDMC

The SDMC coordinates with all the national focal centres to generate effective management and mitigation of disaster issues to build resilience of the member states and communities to disasters, strategic learning, research, training, system development expertise, promotion and exchange of information for effective disaster risk reduction and management in the region. The SDMC is to coordinate with National Focal points of Member Countries to develop appropriate strategies for implementing the networking strategy for disaster risk reduction. (See Table 2.1)

**Table 2.1 National Focal points of Member Countries of SAARC**

<b>Country</b>	<b>National Focal Point of Coordination</b>
<b>Afghanistan</b>	<b>Afghanistan National Disaster Management Authority (ANDMA)</b>
<b>Bangladesh</b>	<b>Disaster Management Bureau (DMB)</b>
<b>Bhutan</b>	<b>Ministry of Home and Cultural Affairs (MHCA)</b>
<b>India</b>	<b>National Institute of Disaster Management (NIDM)</b>
<b>Maldives</b>	<b>Disaster Management Centre (DMC)</b>
<b>Nepal</b>	<b>Ministry of Home Affairs (MHA)</b>
<b>Pakistan</b>	<b>National Disaster Management Authority (NDMA)</b>
<b>Sri Lanka</b>	<b>Ministry of Disaster Management and Human Rights (DMHR)</b>

*Source: Ref: Organizational structure of SAARC. Disaster Management Centre. Available at: [http://www.saarc\\_sdmc.nic.in/organogram.asp](http://www.saarc_sdmc.nic.in/organogram.asp) [Accessed on 15 February, 2015 at 12.54 p.m.]*

### ***Disaster Management and Climate Change: SAARC***

The understanding on natural disaster management scenario is incomplete without referring to the issue of climate change affecting all the regions of the world including South Asia. According to the Report (2014) entitled “Integration of Disaster Risk Reduction and Climate change Adaptation in SAARC Region: Implementation of the Thimphu Statement on climate change that climate change is an emerging major threat to the existence of the world<sup>91</sup>. The earlier scientific enquiry to understand the co relationship between climate change and increasing incidence of natural disasters like the Fourth Assessment Report of the Intergovernmental Panel on climate change (IPCC 2007) and Stern Report 2006 has also anticipated that rising temperatures and global warming may lead to sea level rise<sup>92</sup>. This may lead to new vulnerabilities with differentiated socio-economic impacts in terms of the different size and capabilities of the eight SAARC members to deal with current climate related vulnerabilities. It has emerged as one of the most threatening causes for the fragile eco-system of South Asia.

The adverse affects of climate change was highlighted at the international forum of the UN Framework Convention on Climate Change (UNFCCC) in 1992 that set up the Intergovernmental Panel on Climate Change (IPCC) to study impact of climate change on ecosystems. The Fourth Assessment Report (2007) of the IPCC finds beyond reasonable doubt that the Earth’s climate is warming due to a substantial degree by anthropogenic interference in nature that also affects the ecosystems<sup>93</sup>. The recent IPCC’s Fifth Assessment Report (2014) has further indicated with scientific certainty that increasing concentrations of greenhouse gases in the atmosphere due to human activities have been the dominant cause of the observed warming since the mid-20th century. The Fifth Assessment Report of IPCC has further indicated that in future climate change



is expected to increase the frequency and intensity of current climate related hazards and the emergence of new hazard turning into disaster The impact of climate change would enhance the vulnerability of the poor communities, which constitute half of the population of countries of South and especially the poor<sup>94</sup>.

It has been projected that the developing countries including the least developed countries would be highly impacted by climate change. According to the least developed countries (LDCs) report 2010, the LDCs account for one percent of the world's total GHG emissions but the frequency and intensity of extreme weather events have risen five times higher now with 519 events in the last decade than during the 1970s with 116 events of disasters. Moreover in the last decade about forty percent of all casualties related to natural disasters were found in the poorest countries<sup>95</sup>.

Global mean sea level will continue to rise during the 21st century under all emissions scenarios – low and high. The rate of sea level according to the rise will very likely exceed that observed during the past three decades (IPCC 2007). This will have consequences for South Asia's coastal settlements, as well as for coastal economies, cultures and ecosystems. Low lying, densely populated coastal areas in South Asia, including in India and Bangladesh, will be at increased risk of storm surges<sup>96</sup>.

In this context it is vital to mention that the impact of climate change with ever present disaster threats would enhance the vulnerability of the poor communities which constitute half the population of South Asia. South Asia with its ever growing population (over 1.6 billion) low level of development, nearly 600 million people in South Asia survive in less than \$ 1.25 per day and agriculture constituting 60% of the economy with more than half of the member states classified as Least Developed Countries ((LDCs) Afghanistan, Bhutan, Maldives and Nepal)

struggling with the issues of poverty, health care and education, climate change vulnerability is expected to compound the problem further<sup>97</sup>.

Melting glaciers in the Himalayas due to global warming is projected to increase flooding and affect water resources within the next two to three decades. The implications of melting Himalayan glaciers and sharing of scarcer river-basin water resources will pose a formidable challenge for India, Nepal, Bhutan, Bangladesh, Pakistan and China. India is dependent on perennial rivers, which originate and depend on glacial melt-water in the Hindukush and Himalayan ranges. Since the melting season coincides with the summer monsoon season, any intensification of the monsoon is likely to contribute to flood disasters in the Himalayan catchment area. Rising temperatures will also contribute to the raising of snowline, reducing the capacity of this natural reservoir, and increasing the risk of flash floods during the wet season<sup>98</sup>.

Understanding the vulnerability of the South Asia region towards climate change the Fourteenth SAARC Summit (3-4 April) 2007 in New Delhi expressed 'deep concern' over the global climate change and called for pursuing a climate resilient development in South Asia. The Summit declared year 2007 as the "Year of Green South Asia" in South Asia. The resultant action was the SAARC council of Ministers meeting in New Delhi (7-8 December) 2007 to addresses the issue and finally the Ministerial Meeting held in Dhaka (3<sup>rd</sup> July) 2008 adopted the Dhaka Declaration and SAARC Action Plan on Climate Change<sup>99</sup>.

The SAARC Action Plan on Climate Change (SAPCC) was endorsed by the Fifteenth SAARC Summit on August 3, 2008 at Colombo, Sri Lanka. The then Secretary General of the SAARC Secretariat Mr. Dr. Sheel Kant Sharma in his inaugural speech highlighted that the emphasis of SAARC is to move from a declaratory to an implementation phase. In this context he emphasized the role of SAARC regional centres (SMRC, SCZMC, SDMC and SFC) that would

contribute synergistically with their respective mandates in enhancing the SAARC climate change resilience by pursuing SAARC Action Plan on Climate Change<sup>100</sup>.

The institution to implement SAARC Action Plan on Climate Change rests with the SDMC which is to develop strategies and evolve road maps on various themes to integrate disaster risk reduction with climate change adaptation for building resilient South Asia. The SAPCC (2009-2011) has identified seven areas of cooperation covering, adaptation, mitigation, technology transfer, finance and investment, education and awareness management of impacts and risks and capacity building for international negotiations. This was further strengthened by the Delhi Statement on Cooperation in Environment (2009) that identified many critical areas that needs to be addressed. It also reaffirmed the commitment of the member states for regional cooperation in areas of environment, natural disaster risk reduction and climate change<sup>101</sup>.

The major step in this direction came during the Sixteenth Summit (28-29 April) 2010 held at Thimpu, Bhutan. “Climate Change” was the theme of this Summit Meeting as it adopted the “Thimpu Statement on Climate Change” that allows member countries to take up initiatives at the regional and national level to address the issue in a focused manner. The Thimpu Statement also established the Inter-Governmental Expert Group on Climate Change (IGED-CC) as the regional mechanism to monitor progress and make recommendations for further implementation of the Thimpu Statement<sup>102</sup>.

The Thimpu Statement laid the framework for commissioning of a SAARC Intergovernmental Climate related Disaster Initiative on the integration of climate change. Another major achievement of the Sixteenth SAARC Summit was the formal adoption of the “SAARC Convention on Cooperation on Environment” which was signed at the Summit Meeting, ratified

by all members and has come into force (with effect) from 23<sup>rd</sup> October, 2013. The Convention is a binding agreement on all the member states who have agreed to cooperate in various field of environment and sustainable development issues by adopting eco-friendly approaches and technologies so that South Asia could become a world leader in low-carbon technology and renewable energy. The mechanism to implement the Convention has been entrusted with the Governing Council comprising of the Environmental Ministers of the Member States<sup>103</sup>.

Another agreement of vital importance has been reached by the Member States on natural disasters was at Seventeenth SAARC Summit on Rapid Response Mechanism on Natural Disaster (10-11 November) 2011 at Maldives called the SAARC Agreement on “Rapid Response to Natural Disasters”. The framework for this agreement was reached earlier at the Eighth Meeting (19 October, 2009) of SAARC Environment Ministers that considered the Report and Draft Agreement on SAARC Natural Disaster Rapid Response Mechanism as well as to consider a Regional Environmental Treaty that was to be released later<sup>104</sup>.

The “SAARC Agreement on Rapid Response to Natural Disaster” was signed at this Summit Meeting which is to yet be ratified by all the member states<sup>105</sup>. The operationalization of SAARC Natural Disaster Rapid Response Mechanism as provided under the Agreement would institutionalize regional cooperation among member states in areas of critical response after a post disaster scenario in the region<sup>106</sup>. The Kathmandu Declaration 2014 reiterated member countries commitment to three vital areas of cooperation i.e. environment, natural disaster management and climate change. The recent 18<sup>th</sup> SAARC Summit held at Kathmandu, Nepal in (26-27) November, 2014, concluded with a Conference Document titled “The Kathmandu

Declaration–Deeper Integration for Peace and Prosperity” reaffirmed the member countries commitment to the welfare and prosperity of the people of South Asia<sup>107</sup>.

With the growing concern for climate change and natural disaster the member countries directed the concerned bodies and mechanisms for effective implementation of SAARC Agreement on Rapid Response to Natural Disaster, SAARC Convention on Cooperation on Environment and the Thimpu Statement on Climate Change. In the light of threats posed by climate change to poverty alleviation, food security, health, education, social protection and other relevant issues highlighting the predicament of human security and sustainable development of the region the member states reiterated their commitment for regional cooperation in their future actions.

The existing mechanism for disaster risk reduction is being extensively carried by the member states of SAARC under the flagship of regional cooperation. Under the present circumstances this is going to bring positive results by reducing potential conflicts among the South Asian States on issues concerning the security of the population and sustainable development of the region. It would further encourage South Asian states to concentrate upon stabilizing and implementing various cooperative programmes of action particularly relating to disaster and growing concern for climate change in their further interactions.

### ***Inter-State Mechanisms to Address Disaster Management in South Asia***

At this juncture it is also pertinent to understand and take into account other vital institutional mechanisms functioning at the inter-state level in South Asia, primarily because almost all the South Asian states are closely interconnected to each other. Among all the South Asian states Bangladesh, India and Nepal are closely connected not only in terms of geographical location but

also in terms of sharing common natural resources. This also requires an understanding of other bilateral institutional and legal framework working between these countries of South Asia.

South Asia as a region is highly vulnerable to flood disasters. Bangladesh, India and Nepal lying in the Ganga–Brahmaputra-Meghna Basin (GBM) faces flood disaster on a regular basis. This problem is transboundary in nature and the growing threat of climate change is making the problem more complex. The management of flood disasters, requires not only structural solutions that requires collaboration among countries sharing common river systems to adopt flood control mechanism such as regulation and joint planning, implementation of water control structures, dam embankments and other structural measures. At the same time it also requires strengthening of both the legal systems and institutions responsible for management of flood disasters<sup>108</sup>.

Bangladesh, India and Nepal are closely connected through the common river systems Bangladesh and India share three major river system – The Ganges, the Brahmaputra and the Meghna, commonly as the Ganga-Brahmaputra-Meghna (GBM) river basin system. It also consists of many tributaries which are also transboundary in nature. The GBM River System is the third largest fresh water outlet to the world being exceeded only by Amazon and the Congo River system<sup>109</sup>. The GBM river basin system has the three most densely populated basins in the world with a total population of 620 million almost supporting one-tenth of the world population<sup>110</sup>. The population density of the Ganges is estimated at 375 per person per sq. km., one of the highest in the world. This heavy density has resulted in the exposure of the people to flood related disasters making them more vulnerable to rising natural calamities. This also

requires management of water resources at the collaborative plain among nations of South Asia<sup>111</sup>.

### ***I. Inter-State Mechanisms to Address Disaster Management: Bangladesh and India***

The sharing of common river water resources is one of the major areas of interaction between Bangladesh and India. Similarly among all bilateral disputes between India and Bangladesh the most critical has been the sharing of common water resources and its management to control flood disasters in the region. The sharing of the waters of Ganges dispute between India and Bangladesh goes back to the days of partition when most of the Indian sub-continent was ruled as a single British entity<sup>112</sup>.

Water related issues arose in the 1950's and the 1960's when the Hoogly river experienced silting problem and navigation for trade route was becoming difficult on the Indian side. The Indian Government decision to build a massive dam at Farakka, the point where Ganges becomes a boundary river between India and Bangladesh worsened the problem. This dam would divert the waters of the Ganges to the river Hoogly, which in turn would flush the port of Calcutta from siltation. With Bangladesh becoming an independent nation in 1971, the Farakka Project became a matter of dispute between the two countries<sup>113</sup>.

The Indo-Bangladesh Treaty of Cooperation and Friendship signed in 1972 between Indian Prime Minister Indira Gandhi and Bangladeshi Prime Minister Sheikh. Mujibur-Rehman was a new direction in bilateral cooperation that pledged the nations to consult with each other during the times of security threats and settlement of bilateral disputes within the sovereign consent of both the countries. The Treaty of Friendship and Cooperation 1972 included treaty Article 6 on

flood control, river basin development, development of hydroelectric power generation and irrigation. The Treaty is to serve not only as a legal statute of technical character but is also a framework treaty for future rational principles for regulating the equitable water distribution between Bangladesh and India<sup>114</sup>.

The Treaty as Surya P. Subedi points out not only deals with the Ganges but also lays down the basic principles for conclusion of future agreements on other common rivers. The cooperation between Bangladesh and India has become substantial through the working of the Joint River Commission that is functioning as a vital mechanism not only building confidence and cooperation regarding sharing of common rivers but also playing an important role in flood control management<sup>115</sup>. During the same period the Indo-Bangladesh Joint River Commission was established on 24<sup>th</sup> November, 1972 to resolve water related issues particularly the Farakka Project and flood control measures between both the countries.

The decision to establish a Joint River Commission was taken at the end of the conclusion of the Treaty of 1972 when a Joint Declaration was issued by both the countries. The Joint Declaration stated that experts of both the countries are directed to formulate detailed proposals on advance flood warning, flood forecasting, study of flood control and irrigation projects on the major river systems and examine the feasibility of linking the power grids of Bangladesh with the adjoining areas of India so that water resources of the region could be utilized on an equitable basis for the mutual benefits for the people of both the countries<sup>116</sup>.

The Joint River's Commission is based on legal statute, a bilateral agreement between India and Bangladesh. The status of the Commission was formalized through the issuance of a legal instrument that described the structure and functions of the Commission. On November 24, 1972



the two countries signed the Statute of the Indo-Bangladesh Joint Rivers Commission in Dacca<sup>117</sup>. According to Article I of the 1972 Indo-Bangladesh Statute, it mentions the need for the establishment of a Joint Rivers Commission for adopting measures that would contribute to the maximization of benefits for both the countries. According to Article II of the Statute, each country would appoint four members, including a Chairman who would hold office for a period of 3 years. Two of the four members will be engineers. The Chairmanship of the Commission is to be held annually in turn between the two countries. The Joint Rivers Commission works for fifty-seven identified border rivers sharing fifty-four with India and three with Myanmar<sup>118</sup>.

The spirit of cooperation was further carried by the establishment and functioning of the Joint River Commission. The sharing of water resources, the Farakka Barrage dispute and flood control measures dominated most of the meetings of the Commission that shaped to a large extent the functioning of the Commission. An analysis of the functions of the Joint Rivers Commission reveals the following functions. The functions of the Commission according to Article 4 (i) and (ii) of the Statute<sup>119</sup> are:-

- I a) The Commission is responsible for maintain joint efforts between the participating countries in order to ensure the most effective joint efforts in maximizing benefits for the Common River System to both countries.
- I b) It is to formulate flood control works and to recommend implementation of joint projects between both the countries.
- I c) The Commission is responsible to formulate detailed proposals on advance flood warnings, flood forecasting and cyclone warnings.

I d) It is to study, analyze and encourage coordinated research on flood control and irrigation projects so that water resources of the region can be utilized on an equitable basis for the natural benefits of the two countries.

I e) It is to formulate proposals for carrying out coordinated research problems of flood control, affecting both the countries.

In addition according to Article 4 (ii) – “The Commission shall also perform such other functions as the two governments, may be mutual agreement directs it to do. In addition Article 6 of the Statute mentions that the Commission shall adopt their own rules of procedures subject to the provisions of this Statute. Further Article 9 of the Statute is significant as it states that the decision of the Commission shall be taken on the basis of the unanimous decisions of both countries. It shall be referred to the two governments to be dealt with on a bilateral basis in a spirit of mutual respect and understanding. Other major responsibilities of Joint Rivers Commission can be summarized as follows: -

- a) Negotiations with neighboring countries on development, management and sharing of water resources of the transboundary rivers.
- b) Holding regular meetings of (1) Joint Rivers Commission; (2) Joint Committee of Experts (3) Joint Committee on sharing the Ganges water and (4) Standing Committee and monitoring the meetings of different local level Committees with India.
- c) Resolution of the problems of transboundary rivers through its subsidiary organs like Standing Committee and Local Level Committee.
- d) Monitoring and implementation of the arrangements for sharing of dry season Ganges water as stipulated in the 1996 Ganges Water Treaty.

- e) Working jointly with India and Nepal on exchange of relevant data and information, preparing detailed proposal on advance flood warning, flood forecasting as well as to harness and develop the common water resources for optimum utilization.
- f) It is also to work jointly with Bhutan and Nepal for coordinated research and studies on flood control and water management of the tributaries of Ganges and Bhramaputra.

In this context it is pertinent to state that the Commission functions as a specialized institution that promotes policy and research activities for regulating the equitable distribution and optimum use of water resources between Bangladesh and India. After long years of negotiations one of the major achievements under the Joint Rivers Committee was the conclusion of thirty year Ganges Water Treaty in (12 December) 1996 on sharing the Ganges water at the Farakka Barrage. This was a new chapter unfolding in Indo-Bangladesh Relations based on definite principles for sharing of water resources as well as measures undertaken for further negotiations on other common rivers<sup>120</sup>.

The Indo-Bangladesh Joint River Commission's thirty – second meeting held on 18<sup>th</sup> July, 1997 also endorsed the view that the desire of political will and cooperation between both the countries will bring the desired welfare of the people. This confidence building measure laid the framework for future action to be taken up by the Commission that was acknowledged for monitoring the system of sharing water resources and flood control management in the region. This has also led the Commission to discuss the next major water sharing dispute between India and Bangladesh on Teesta River<sup>121</sup>. Even the thirty – third meeting of the Joint Committee of Experts of the Joint River Commission deliberated on the issue that was held in New Delhi (9-10 April) 1999, when the Commission was directed to deal with the issue to formulate technical and scientific study on water distribution for both the countries. In this context its worth mentioning

that Bangladesh and India share fifty – four border rivers and sharing of river water resources has always been critical for both the countries. Teesta is the most important river and Bangladesh is very keen on sharing water agreement with India. Till date no definite agreement has yet been reached on sharing of the Teesta waters as it hampers the interest of West Bengal one of the important states of India that gets affected by the sharing agreement<sup>122</sup>.

Under the present system, the existing mechanisms supporting the transmission of flood forecasting data on major rivers such as the Ganga, Teesta and Brahmaputra during the monsoon season is carried between both the countries. Particularly the Indo-Bangladesh Task Force of Flood Management tries to identify the gaps and technical faults in the embankments of the common rivers between both the countries and coordinate in technical expertise for its repairment to avoid flood disasters. This sharing of information of flood forecasting has helped Bangladesh to shift its people to safer shelters<sup>123</sup>.

To strengthen bilateral cooperation on flood management, India is also providing the flood data of Farakka for Ganga (from 15<sup>th</sup> June to 15<sup>th</sup> October) and the Flood data of Pandu, Goal Para and Dhubri for Brahmaputra and of Silchar for Barak during monsoon period (from 15<sup>th</sup> May to 15<sup>th</sup> October) to Bangladesh for use of their flood forecasting and warning arrangements. It is also providing flood forecasting data for Teesta, Manu, Gumti, Jaladhaka and Torsa and other rivers. The transmission of flood forecasting information has helped the civil and military authorities in Bangladesh to shift people to safer places<sup>124</sup>. In recent concluded meeting in July, 2013 of Indo-Bangladesh Round Table Meeting of members and ministers concerned for the Joint River Commission it was agreed upon that since it is not feasible to negotiate separate

agreement for each of the fifty-four trans boundary rivers between India and Bangladesh, it is necessary to adopt an integrated approach for sustainable management of all shared rivers<sup>125</sup>

## ***II. Inter-State Mechanisms to Address Disaster Management: India and Nepal***

The numerous rivers that originate in the region of Northern Himalayas flow through Nepal, India and Bangladesh. Nepal is the upstream riparian source of water power which flows downstream to the lower riparian states of India and Bangladesh. The Rivers of the GBM basin not only sustains the ecosystem of the region but also flood the area during the monsoon. An integrated approach towards management of water resources is required for the benefit of the people of the region.

The Integrated Development of the Mahakali River Treaty that was signed between Government of India and Government of Nepal on February 12, 1996 was to bring out an integrated approach towards water resource management in the region. The treaty is considered a mechanism to address bilateral water dispute between both the countries. The objective of the treaty was primarily to generate huge amounts of hydroelectricity and trap monsoon water for irrigation purposes during the dry season. To some extent the treaty covers to manage flood control measures in the region<sup>126</sup>. In the Treaty Document concerning the Integrated Development of the Mahakali River, Article 9 of the Treaty of 1996 is particularly important as it lays down the basic provisions for the establishment of a Mahakali River Commission. The commission shall be guided by the Article 3, Article 5 and Article 9 of the Treaty based on the principles of equality, mutual benefit and “no harm” to either party. The Commission is entrusted with wide ranging powers of assessment for the implementation of the Treaty and making appropriate recommendations for both the countries concerned to take measures in compliance with the

provisions of the Treaty. The Commission is represented by an equal number of members from each party or country<sup>127</sup>. The functions of the Mahakali River Commission resulting from the Treaty of 1996 reveals the basic provisions for actions<sup>128</sup> The functions of the commission are briefly presented below:

- (1) The Commission has been directed to seek information and if necessary inspect all structured included in the Treaty of 1996, as well as make recommendations to both the parties to take necessary steps to implement the provisions of the Treaty.
- (2) The Commission is also directed to make recommendations for the conservation and utilization of the Mahakali River.
- (3) It shall be the function of the Commission to provide expert evaluation of the projects and make recommendations to coordinate and monitor plans of action arising out of the implementation of the Treaty.
- (4) Article 9 and Article 11 of the Treaty deals with the dispute settlement mechanism. In the event of a dispute between the parties over the interpretation of the Treaty it states that both the countries reserve their rights in resolving the dispute in compliance of the Commission.

The Pancheshwar Multipurpose project is the centerpiece of the Treaty of 1996. An Indo-Nepal Joint Group of Experts (JGE) finalized the Project under the Joint Project Office that was set up for this purpose in December, 1999. Moreover an Indo-Nepal Committee on water resources has been set up as per the agreement in 2000 to deal with the existing agreements and understandings regarding water resource management of both the countries. The Committee is headed by the Water Resource Secretaries of both the countries which functioning as the main organization for all other committee related to water issues between both the countries. Similar cooperative assessment is being carried out for the Saptakosi Project Area to prepare a Detailed Joint

Project<sup>129</sup>. The recent 3<sup>rd</sup> Meeting of the Indo-Nepal Joint Committee on Water Resources (JCWR) held in Kathmandu, Nepal (29 September–1<sup>st</sup> October) in 2008 decided to set up Pancheshwar Development Authority (PDA) for the earliest execution of the Project. The 4<sup>th</sup> Meeting of JCWR that was held in March, 2009 that finalized the terms of Reference for the Pancheshwar Development Authority. Both the countries have also reached agreements on Saptakoshi High Dam Multipurpose Project and Saptakoshi Storage–cum Diversion Scheme to be realized as earliest as possible<sup>130</sup>.

In this context it is also significant to take note of the fact that flood control mechanisms are jointly organized and operated between India and Nepal to lessen the distress of the people of GBM River Basin system. To serve this purpose India and Nepal has set up a Joint Committee on Flood Forecasting (CFF) in accordance to the decision taken at the First meeting of the Joint Committee on Water Resources so as to review the existing flood forecasting mechanism on rivers common to both the countries to prepare a flood forecasting master plan. According to the Annual Report of the Ministry of Water Resource (2003-2004), a Joint Task Force was setup to draw this master plan for a comprehensive flood forecasting mechanism to adopted at later meetings of the Committee. During the same period a High Level Technical Committee on Inundation Problem was constituted in 2002 to oversee and investigate the causes and effects of flooding<sup>131</sup>.

According to the Annual Report of Ministry of Water Resources 2012 other joint endeavor carried further was to the subsequent meetings of Joint Group of Experts on Flood Management that was set up in 2004 to investigate the probable causes and effects of flooding and erosion in cross border areas recommending mutually acceptable mitigation measures. Also a Joint

Technical Group on Flood Management was constituted to prepare technical reports to advise Joint Group of Experts of flood management to investigate on the probable cause and effect of flooding and erosion in cross-border areas to be recommended within mutually acceptable mitigating measures<sup>132</sup>.

With reference to the above discussion on the existing mechanisms at the inter-state level particularly concentrating on joint mechanism shared by India-Bangladesh and India-Nepal being geographically, socio-politically and economically connected, a joint cooperation is feasible for the purpose of disaster risk reduction in the GBM river basin system. This is required for the purpose of protection of the livelihood and ecosystem of the region. Bangladesh, India and Nepal can cooperate for a comprehensive people centered plan for the “optimum development of Himalayan water resources” keeping aside their differences for the betterment of the region<sup>133</sup>. This also implies that proper management of water resources could support the disaster risk reduction framework in the region to ensure human security and sustainable agenda.

The imperative of disaster risk reduction implies mainstreaming of mechanisms and instruments of disaster risk reduction in development planning. The Hyogo Framework of Action 2005 had generated the platform for South Asian countries to make a beginning to pursue the mainstreaming of disaster risk reduction in their respective plans, policies and development scenario<sup>134</sup>. This mainstreaming has resulted in institutional level activities particularly reflected in the development of legislative framework and institutional capacity to manage the devastating impact of disasters in respective countries. The next exercise Sendai Framework (2015-2030) recommended the strengthening of good governance in disaster risk reduction to secure the lives of the individual and the community from disaster threats.



In **conclusion** it can be stated that both policy and institutional mechanisms at the international, regional and national levels are effective measures to deal with the devastating impact of disaster globally including South Asia. The analysis for the various existing mechanism related to disaster management at the international and regional level shows that the countries are in the process of applying both legal as well as institutional mechanism to address the issue of disaster management. At the same time a collaborative and cooperative arrangement among the states of South Asia can bring about plausible step for setting up viable mechanisms for strengthening disaster mitigation programmes and projects to address the sustainability agenda.

In spite of these existing mechanisms, disaster event have not lessened. Even regional mechanism shows limitations in its implementation procedure due to inherent weakness of the regional organization and in this case SAARC. The process is difficult and requires long term mitigation procedures to be applied through policy initiatives and institutional mechanisms for strengthening disaster management by respective countries. The effort and exercise to strike a balance between economic development, environmental security and to address the issue of natural disaster from the perspective of human security brings out various limitations in the form of political and social constrains to address disaster preparedness and mitigation.

To substantiate the study a questionnaire survey was circulated to bring out an understanding of disaster issues and existing policy framework regarding disaster management. On the issue of international mechanism having resulted in mainstreaming of natural disaster management plan at the national level, 60% of the total respondents opinionated that international exercise has resulted in mainstreaming of natural disaster management in national plans and policies in many countries. On the issue of South Asian states share commonalities regarding disaster issues while

75% of the total respondents agreed that commonalities do exist, on the question of South Asia having been successful in addressing disaster about 68% out of the total respondents believed that the South Asian states were successful to some extent possible in addressing disaster issues while 30% of the respondents answered that the South Asian states have remained unsuccessful to address disaster issues. Within the regional framework of SAARC the question attempted to elicit opinion on whether the parameters and modalities addressing disaster issues were adequate. Analysis revealed that 55% of the respondents felt SAARC as a regional framework addressing disaster issues has been not adequate, only 45% were of the opinion felt that it was adequate.

Under the present circumstances this perspective may bring positive results by reducing potential conflicts among the South Asian states on issues concerning sustainable development and security of the population of the region. It would further encourage South Asian states to concentrate upon stabilizing and implementing various collaborative and cooperative programmes of action particularly relating to disaster and growing concern for climate change in their further interactions. Even the respondents of the question survey opinionated that though regional cooperation remains one of the mechanisms to address disaster risks the member states must work more affirmatively to bring cooperation and collaboration among themselves to deal with insecurities related to natural disaster scenario in the region.

Especially in the case of Bangladesh, Maldives and Srilanka, regional forum of SAARC is the best possible alternative of disaster risk reduction mechanism in the region. As aptly remarked by the Director General of Disaster Management Department of Bangladesh, “SAARC is already working as the regional platform to address disaster risk reduction issues” This mechanism must be further enhanced and strengthened to improve bilateral relations among member states to

address emergent issues like climate change related disaster events which are often trans-boundary in nature due to the geophysical placement of the countries in the Indian sub-continent<sup>135</sup>.

Recent disasters experiences in the sub-continent has shown that existing mechanisms for disaster mitigation and management requires further strengthening and better coordination at the national level for mainstreaming the concern for disaster management. The complexities in the implementation of disaster management framework would be better understood in the country specific chapters. This brings to address the extent of policy as well as institutional measures and mechanisms undertaken at national level and in this case by Bangladesh and India to disaster mitigation would be attempted in the following chapters to come . The next chapter will deal with the policy matrix and disaster management framework in Bangladesh and will try to find out how far Bangladesh has been successful in mainstreaming disaster risk reduction in its development agenda to ensure human security.

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## Chapter III

### *Natural Disaster Policy and Management in Bangladesh*

#### *Introduction*

Bangladesh is a new nation, with an old history. Situated in the South Asian region, it must be contextually studied within the broader region in which it lies. The People's Republic of Bangladesh emerged as a new nation in the international scene following the War of Liberation on 16<sup>th</sup> December, 1971. William Van Schendel points out that Bangladesh emerged with an importantly Islamic Bengali identity strongly rooted in the eastern deltaic milieu<sup>1</sup>. A country more prominently known for under development, poverty and natural disasters, Bangladesh's history and lives of its people has been shaped by the geological history of the deltaic plain at the confluence of the Ganges (Padma) Brahmaputra (Jamuna) and Meghna Rivers and their three hundred and ten (310) numerous tributaries and distributaries<sup>2</sup>.

Bangladesh is situated within South Asian region. The South Asian region is a geographically distinct sub- continent, a sub-system within the international system<sup>3</sup> (See Map 3.1) An examination of the geographical location reveals close proximity among the countries of South Asia, whereas in terms of other variables particularly socio-political, socio-economic and socio-religious elements they exhibit vast differences. The region is also characterized by considerable internal diversity, linguistic differences as well as a range of distinctive political systems. In spite of the stark differences the region exhibit certain forces that bind the countries together as a

region, which provides it a unity within which political, economic and cultural process of integration takes shape.<sup>4</sup>

*Map 3.1: Map of Bangladesh in South Asia*



*Source: Ref: <http://www.worldatlas.com/webimage/countrys/asia/lcolor/bdcolor.htm> [Accessed on 02 August, 2015]*

South Asia also reveals a well defined geopolitical region with a shared social, cultural and civilizational past and a colonial history that has impacted inter-state relations in the post colonial era. The entire nation building process of the sub continent makes South Asia a unique region that has entered the twentieth century as a community and leaves this century as seven nations divided by the historical inheritance<sup>5</sup>. Bangladesh well established within the region of South Asia has continued to evolve and change with times.<sup>6</sup>

Bangladesh is a land of natural disasters. From time immemorial Bangladesh has been one of the most effected countries in South Asia from natural disasters<sup>7</sup>. As a result dealing and struggling with natural disasters has been one of the major pre-occupation of the people of Bangladesh. The geographical location, the multiplicity of rivers, the climatic conditions, the characteristic of land and soil, the dense concentration of the population in the flood plain region, the socio-economic conditions of being the least developed country with high incidence of poverty. Once referred to as “the test case of development” by western scholars<sup>8</sup> and the regular occurrence of natural disasters has exposed and added to the countries varied problems of development. The most critical challenge for development at present is to reduce disaster vulnerabilities of the people. The management of disasters is highly desirable and challenging effort that requires an in-depth inquiry into the matter.

### ***Geopolitical and Ecological Setting of Bangladesh***

The geopolitical location of Bangladesh is a strong determining factor. Bangladesh is a low lying deltaic flood plain, with a vast coastline on the northern littoral of Bay of Bengal. Situated within the sub continent of India it occupies a strategic position in South Asia. The country shares its borders with India on the west, north and north east, Myanmar on the South East and Bay of Bengal on the South. Particularly the Indian States of West Bengal, Meghalaya and Tripura border Bangladesh in the west, north and east and Myanmar forms the southern part of the eastern frontier, a small country with a vast coastline and home to nearly thirty five million people.<sup>9</sup> Bangladesh lies on the Indian sub-continent between the longitudes 88°01' and 92°40' E and latitudes 20°25' and 38°40' N, occupying total area of 143,999 kilometer square.<sup>10</sup> It is one

of the most densely populated country of the world with 160 million inhabitants growing with each passing day.<sup>11</sup>

Bangladesh is drained by some of the biggest rivers and forms the largest delta in the world, most of which is occupied by the delta of the Ganges and Brahmaputra river system, following the Meghna joining in the south. Most of the Bangladesh is a flat terrain with only a tenth of the land hilly or mountainous, low hillocks and hills bordering the plains. This alluvial fertile flood plain is crisscrossed by the mighty Padma, Meghna, Jamuna and their innumerable (310) tributaries and distributaries. These rivers drain a 6,87,500 sq. miles of catchment area and proximately 7.5 percent of this catchment area (130,000 km. sq.) lies within Bangladesh.<sup>12</sup> A land of rivers that is flooded regularly during the monsoon forms the deltaic catchment area by the Ganga (Padma), Brahmaputra (Jamuna) and Meghna River Basin commonly known as the Ganga-Brahmaputra-Meghna River Basin System (GBM). Since these rivers and their tributaries create a large network of rivers, streams and canals covering at least 24000 kilometers in length which brings enormous quantities of silt making the region highly fertile.<sup>13</sup> (See Map 3.2)

The range of rainfall that Bangladesh receives and the enormous flow of large rivers are often considered a hindrance to development. It is vital to note that floods are serious problems in Bangladesh and the seasonal abundance of water throughout the year at times indicates that this asset can bring only partial benefit. The deltaic plain which is less than three meters (3 m) above the sea level is often subjected to sever flooding requiring institutional mechanism to ensure proper drainage of the region, protecting the people, their lives and livelihood secure.<sup>14</sup>

An analysis of the climatic condition experienced by Bangladesh reveals that the region is characterized by high temperature, high humidity, heavy perspiration and marked seasonal variations. This tropical climate acts as a major asset for the agricultural sector.<sup>15</sup> In terms of total land area occupied by Bangladesh it appears that out of 36.79 million acres is land and the rest is inland water bodies. In spite of its relatively small size Bangladesh represents a complex agro-ecological region that makes agricultural productivity essential for domestic consumption to meet the requirements of food security.<sup>16</sup>

**Map 3.2: River Map of Bangladesh**



*Source: Ref: <http://www.worldatlas.com/webimage/countrys/asia/lcolor/bdcolor.htm> [Accessed on 02 August, 2015]*



The geographical position of Bangladesh and its relation with ecology and human settlement has a far reaching impact on sustainable development. Bangladesh has a wide variety of soils, among which approximately five hundred soil types has been recognized (upto 1998) and where within twenty one general soil types.<sup>17</sup> This diversity and complexities present in the natural soil has been modified due to number of external factors and also has been enhanced due to human impacts on the environment.

In this context Hugh Brammer points out that the resultant of various human activities such as the clearance of the natural forest or grassland vegetation for cultivation on hill soils, substitution for crops for natural vegetation, cultivation on the rich alluvial flood plain, use of fertilizers and contamination by pollutants in irrigation water (arsenic in ground water) and other associated problems. Provided that other conditions are met, soil fertility factors must be considered dynamic which supports a wide variety of land – based products ensuring much higher yield in the agricultural sector<sup>18</sup>.

According to the Bangladesh State of the Environment Report, 2001 (SOE)<sup>19</sup> soil erosion is a serious problem in the country. Due to the depth and duration of the seasonal flooding and application of various flood protection mechanism, drainage, irrigation system has its impact on the natural soil in the flood plain areas. The coastal plain on the other hand comprises the districts of Khulna, Barisal, Noakhali and Chittagong in Bangladesh except the hill areas the soil is very fertile, whereas the southern part of the region lies under water during the rainy season.

The SOE Report, 2001 further states that natural events such as cyclones and floods also cause land loss and decrease the functional capacity of the soil. In the coastal areas soil degradation

results from un planned land use and intrusion of saline water. In this context it is vital to mention that land degradation has also taken place in the Chittagong Hill Tracts (CHTs) due to rapid changes in demography, traditional shifting cultivation practices (jhum) development of roadways and other manmade infrastructures. The Madhupur Tract and Barind Tract also faces similar problems. There are other reasons such as rapid urbanization, industrialization, depletion of ground water due to extensive irrigation mechanism that has resulted in soil degradation. Particularly the top soil erosion in hill districts has increased and seventeen percent of the soil resources have deteriorated during the period 1964-1985<sup>20</sup>.

A focus on the natural resources brings into light the state of forest in Bangladesh. According to current scenario, the Government of Bangladesh projects the total forest area to be about seventeen percent in 2011.<sup>21</sup> Forest acts as the major source of natural resource that contributes to the economic and ecological stability of the country. The Hill Forest generally accounts for forty seven percent of the forest area supplying forty two percent of the commercial timber production. Sal is the predominant species here.<sup>22</sup>

The Sundarbans referred to as the “Mangrove Forests” is the world’s largest single tract Mangrove Forest spreading across the borders into the state of West Bengal, India. The total area covered by Sundarbans is about 555,000 million hectares of the total forest cover in Bangladesh. It also supports a large, rich and divers flora and fauna. It also acts as natural embankment to coastal flooding in Bangladesh.<sup>23</sup> In the 1990’s and 1980’s, Bangladesh saw a rapid decline in the forest cover which was checked in the 1990’s due to growing environmental consciousness

for environmental protection and growing pressures of environmental groups associated with the issue of protection and promotion of sustainable development.

The forest cover not only substantiates the commercial purpose, it also provides the natural protection from soil erosion which is very high in case of Bangladesh due to floods and floodings and also during coastal storm surges a fact well acknowledged by Rashid. Er. Haroun The following table 3.1 and 3.2 presents the various categories and types of forests in Bangladesh according to the statistics presented by the Government of Bangladesh within the period of 1975-2003 on the status of forests in Bangladesh. The Forest and Agricultural Organization (FAO) Report 2011 also substantiates the position of Bangladesh regarding the status of forests.<sup>24</sup> (See table 3.1. and 3.2)

***Table: 3.1 : Forest Area by Categories (in square miles)in Bangladesh***

<i>Category</i>	<i>1975-76</i>	<i>1985-86</i>	<i>1995-96</i>	<i>2002-03</i>
<i>Reserve</i>	<i>4,430</i>	<i>5,718</i>	<i>5,643</i>	<i>6,996</i>
<i>Acquired</i>	<i>365</i>	<i>262</i>	<i>372</i>	<i>33</i>
<i>Vested</i>	<i>41</i>	<i>35</i>	<i>33</i>	<i>15</i>
<i>Protected</i>	<i>222</i>	<i>207</i>	<i>149</i>	<i>143</i>
<i>Unclassed State</i>	<i>3502</i>	<i>2443</i>	<i>1840</i>	<i>2749</i>
<i>Water Board and Khas</i>	<i>48</i>	<i>54</i>	<i>273</i>	<i>93</i>
<i>Total</i>	<i>8,608</i>	<i>8,719</i>	<i>8,310</i>	<i>10,029</i>
<i>Source: Ref: Statistical Year Book (2000) Government of Bangladesh, Dhaka UPL Press. Haroun Er. Rashid (2005) Economic Geography of Bangladesh: FAO Report (2011) Bangladesh Forestry Outlook Study. pp 98</i>				

**Table 3.2: Types of Forest (Managed by Forest Department, Government of Bangladesh) (in hectares) in Bangladesh**

<i>Types</i>	<i>Area (million hectares)</i>	<i>% of Country Area</i>	
<i>Hill Forests</i>	<i>0.67</i>	<i>4.65</i>	<i>In 2011 Forest Area (% of land area) in Bangladesh was 11.1% according to World Bank Sources in 2011</i>
<i>Natural Mangrove Forest</i>	<i>0.60</i>	<i>4.09</i>	
<i>Planted Mangrove Forest</i>	<i>0.14</i>	<i>0.97</i>	
<i>Sal Forests</i>	<i>0.12</i>	<i>0.83</i>	
<i>Total</i>	<i>1.53</i>	<i>10.54</i>	
<i>Source: Ref: The Forest Department, Ministry of Environment and Forestry (2002) Government of Bangladesh, Dhaka</i>			
<i>Haroun. Er. Rashid (2005) Economic Geography of Bangladesh. UPL Press. pp 98</i>			

In Bangladesh the issues of sustainable development were integrated particularly from the Fourth Five Year Plan onwards (1990-1995) and a separate chapter (Chapter 9) was dedicated to highlight the linkages between environment and sustainable development.<sup>25</sup> An examination of the successive national plans for development reveals plans have focused on the need for the conservation of forests by ensuring the qualitative expansion of forests, increasing the output of wood products and improvement of the natural forest through the policy of afforestation.

To achieve this target a number of relevant activities were added in the plan for the implementation during the plan period. During the Fourth Plan Period the main objective regarding the forestry sector was to expand the land area and the natural plantation from 43,61,984 hectares to 46,94,780 hectares as well as to expand the forest resources, make the forest adequately productive, develop the institutional capabilities and involve local participation for the conservation of forests. The issue of land degradation and wetland encroachment were

also highlighted in the plan. Food production was given highest priority which also resulted in loss of soil quality and loss of bio diversity due to use of mechanized production techniques.<sup>26</sup>

The Fifth Plan Period (1997-2002) placed greater emphasis on achieving sustainable development.<sup>27</sup> The Ministry of Environment and Forests (MoEF) which is the nodal agency has laid the down a regulatory framework to reduce environmental pollution resulting from industrialization. It also laid focus on sustaining agriculture and forestry as well as conserving the bio-diversity taking into account The Earth Summit held in Rio in 1992, it also recognized global climate change and desertification as an important challenge before Bangladesh. As a result the plan attached due importance to the concept of community participation in bringing about sustainable human and ecological development in Bangladesh.

In terms of bio-diversity Bangladesh geographically represents an ideal place for high degree of bio-diversity variations.<sup>28</sup> Located in the tropical hot – humid climate, with heavy rainfall during the monsoon, drought conditions during dry season and mild winter, a deltaic drained by mighty rivers and the rich alluvial soil deposit makes Bangladesh rich in flora and fauna inhabiting different eco systems.<sup>29</sup> The Fourth National Report (2010): Bio-Diversity National Assessment And Programme of Action 2020 has been developed to fulfill Bangladesh's commitment towards implementation of International Convention of Biological Diversity<sup>30</sup>.

At present Bangladesh has 19 nationally designated protected areas, comprising approximately 2458 sq. km. which is 1.66 percent of the land area of the country.<sup>31</sup> Particularly the Sundarbans the largest single tract of natural mangrove forest in the world comprises of 6,01,700 hectare area which is 4.07 percent of the total area of the country and contains 40 percent of the total forest

land. It is said that one square kilometer area of mangrove forests in Bangladesh contains greater biodiversity compared to any other country in the world. Sunderbans is an unique habitat for a large number of wild life species, flora and fauna and endowed with rich natural resources with wider implications for the ecosystem of the country.<sup>32</sup>

To preserve, protect and promote the biodiversity of the country the Government of Bangladesh has developed its National Biodiversity Strategy And Action Plan (**NBSAP**) during the plan period 2003-2004 and has indentified 16 strategies under which 28 action programs has been undertaken to preserve the variety of life, improve agricultural yield and forestry to negate the harmful environmental challenges being generated by industrialization and economic development in Bangladesh.<sup>33</sup>

According to the State of the Environment Report 2001 water resources is very crucial for sustaining life and productivity in Bangladesh. Predominantly being an agrarian economy, water resources is very vital for economic productivity which is influenced by varied hydrological climatic conditions.<sup>34</sup> Bangladesh is richly endowed by water resources with fifty-seven (57) rivers of varying size and intensity entering the country from outside the national territories and flowing through Bangladesh out of which fifty –four (54) have originated in the Himalayan Range and other parts of India and shares three rivers with Myanmar. The rain water flow accounts for seven percent of the fresh water flow while the rest i.e. 93 percent comes from trans-boundary river sources of the Ganga-Brahmaputra-Meghna(GBM) river basin system.<sup>35</sup>

Bangladesh being a lower riparian country it has to face excessive and low water flows during the monsoon (June-October, when is less required) and dry season (Jan-May, when it is badly

required) respectively. This in turn has an adverse effect resulting in shortage of fresh water for agricultural use, navigation, fisheries, industrial production, drinking and domestic purposes. Also due the problems of salinity and arsenic contamination in the ground water resources, has turned into a major problem regarding the supply of fresh water resources. It has also difficult for human consumption. The scarcity of surface water is also observed in the Sunderbans, Chittagong, Noakhali and Dhaka region where the ecological and environmental demands for surface water are higher than the supply.<sup>36</sup>

The State of Environment Report, 2001 has also recognized natural disaster as a major environmental hazard and the extent of its severity can be assessed in terms of its impact on human lives and socio-economic damages caused by these disasters.<sup>37</sup> Since Bangladesh is a disaster – prone country the geographical setting also makes it vulnerable to disasters. Natural disasters cannot be prevented but the damages can be mitigated with adequate planning and adaptation which is also dependent on institutional mechanism generated for this purpose. As such disaster management requires huge resources for mitigation, recovery and preparedness to be integrated into national policy and planning to mitigate negative consequences and impacts on the economic development of the country.

The recent report on environment, entitled “Bangladesh Environment and Climate Change 2012” has recognized the fact that with growing population and its pressure on natural environment, climate change has added up a new dimension to environmental problems and natural disaster scenario in the country. Bangladesh has been identified as the most vulnerable country to climatic change due to its low – laying geographical position with high density of population<sup>38</sup>.

The government of Bangladesh has taken up a number of initiatives such as the formulation of Bangladesh Climate Change Strategy and Action Plan (**BCCSAP**) in 2008, revised and updated in 2009. To implement the action plan the government has established for its operationalization the Climate Change Trust Fund (**CCTF**). The government has allocated US\$ 300 million. With the support of development partners the Government of Bangladesh has established the Bangladesh Climate Change Resilience Fund (**BCCRF**) and an amount of US\$ 170 million has been deposited for this fund to support the projects initiated under the guidance of BCCSAP to address the issue of climate change.<sup>39</sup>

The analysis of the geo-political setting of Bangladesh as well as its impact on the environment and the ecological sustainability is quite clear that the country is endowed with rich natural resources to progress towards development in terms of socio-economic growth. But the growing concern for sustainability due to industrialization, urbanization, poor sanitation and deforestation are some of the major problems that the people have to face. The degradation of the environment has also become a major threat to the security of the people and the root of the problem lies in factors such as high concentration of population, scarcity of resources, underdevelopment, chronic poverty and failure of developmental policies. Related to this is the issue of natural disasters that has become one of the major security threats in the context of Bangladesh.<sup>40</sup>

### ***Natural Disaster Scenario in Bangladesh***

The natural disaster scenario in Bangladesh presents a perennial problem for development prospects for the country. At present Bangladesh appears to be the most vulnerable, fragile and disaster prone country with greatest disaster risk ranking index of 168 in the world according to

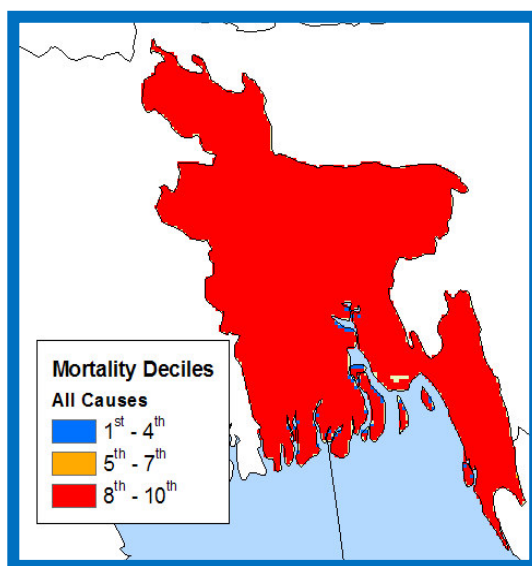


the World Disaster Risk Index (2013)<sup>41</sup>. The geo-physical location of Bangladesh makes it highly vulnerable to natural disasters that cause immense damage to life and property, livelihood, economic infrastructure and development of the country.

Bangladesh faces at least one major disaster a year. It lost on an average of 3.02 percent of its Gross Domestic Product (GDP) every year during the last 10 years and holds the highest mortality rate. The United Nations Development Program has ranked Bangladesh the number one nation at risk for tropical cyclone and number six for floods.<sup>42</sup> During 1990-2008 the annual loss was of US\$ 2,189 million (1.8% of annual GDP) from disasters and the average annual death toll was 8241 i.e. 6.27 percent per one hundred thousand inhabitants<sup>43</sup>.

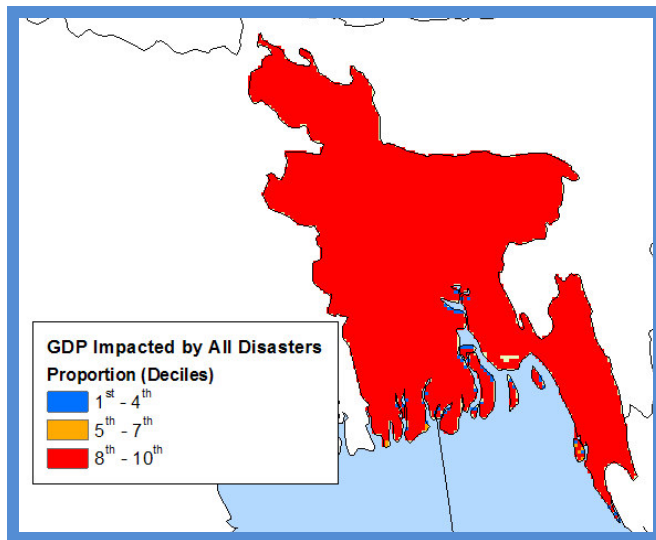
Bangladesh has been considered as a hotspot for natural disasters and risks. The following maps 3.3, 3.4 and 3.5 presents a clear picture of multi hazard risk hot spot and risks that Bangladesh has to face regularly.

**Map 3.3: Multi-Hazard Disaster Risk Hotspots (All Hazards combined and weighted by Mortality and Proportion of GDP Impacted) Mortality Map of Disaster: Bangladesh**



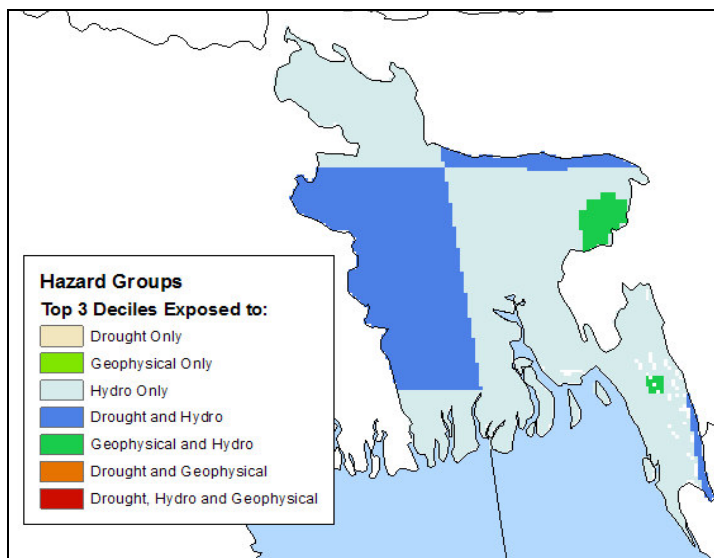
*Source: Ref: The Earth Institute, Centre for Hazards and Risk Research Columbia University "Bangladesh Natural Disasters" Profile.1 [www.ideo.columbia.edu](http://www.ideo.columbia.edu) [Accessed on 15 May 2015 at 8.57 p.m.]*

**Map 3.4: Multi-Hazard Disaster Risk Hotspots GDP Impacted by Disaster: Bangladesh**



Source: Ref: The Earth Institute, Centre for Hazards and Risk Research Columbia University “Bangladesh Natural Disasters” Profile.1 [www.ideo.columbia.edu](http://www.ideo.columbia.edu) [Accessed on 15 May 2015 at 8.57 p.m.]

**Map 3.5: Multi-Hazard Disaster Risk Hotspots by Hazard Groups (Top Three Deciles)**



Source: The Earth Institute, Centre for Hazards and Risk Research Columbia University “Bangladesh Natural Disasters” Profile.1 [www.ideo.columbia.edu](http://www.ideo.columbia.edu) [Accessed on 15 May, 2015 at 8.57 p.m.]

The natural hazards hotspots map as projected above indicates that cyclones and floods pose great risk to Bangladesh on a country level. On the sub-national level the northern and eastern regions of the country are susceptible to earthquakes while the south eastern part is vulnerable all the five hazards i.e. floods, cyclones, drought, earthquakes and landslides. Moreover the combined multi-hazard maps for mortality and Gross Domestic Product (GDP) shows that Bangladesh is in the top three deciles (rank) of risk when compared to the rest of the world.<sup>44</sup> The following table (3.3) presents a historical record of major disasters that had occurred in Bangladesh during the period 1907-2004. Disaster data presented below also suggests that floods and cyclones besides all the other disasters are the major disasters that impact Bangladesh.

**Table 3.3: Natural Disasters in Bangladesh (1907-2004)**

<i>EM-DAT Information (1907-2004): Disaster</i>	<i># of Events</i>	<i>Total Killed</i>	<i>Avg. # Killed</i>	<i>Total Affected</i>	<i>Avg. # Affected</i>
<i>Cyclone</i>	<i>137</i>	<i>614,112</i>	<i>4,483</i>	<i>63,817,281</i>	<i>465,820</i>
<i>Drought</i>	<i>5</i>	<i>18</i>	<i>4</i>	<i>25,002,000</i>	<i>5,000,400</i>
<i>Earthquake</i>	<i>6</i>	<i>34</i>	<i>6</i>	<i>19,125</i>	<i>3,188</i>
<i>Flood</i>	<i>64</i>	<i>50,310</i>	<i>786</i>	<i>369,678,156</i>	<i>5,776,221</i>
<i>Volcano</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>

*Source: Ref: The Earth Institute, Centre for Hazards and Risk Research Columbia University "Bangladesh Natural Disasters Profile.1. www.ideo.columbia.edu [Accessed on 15 May, 2015 at 8.57 p.m.]*

From the above table (3.3) it is quite clear that floods and cyclones are the major disasters that impact the socio-economic development of Bangladesh. The number of events is higher for cyclones and floods. Even the percentage of people killed and affected is much higher in case of floods and cyclones than compared to droughts and earthquakes. Bangladesh faces highest incidence of cyclone events compared to floods but the number of people affected is more by

floods than cyclones. Even the average number of people affected by floods is higher than compared to other events of natural disasters.

### *Vulnerability to major natural disasters*

Bangladesh historically has remained a disaster prone country. With a growing population of about 160 million and living within 147,570 sq. kilometres (the territory has increased after the Land Boundary Agreement with India on 1<sup>st</sup> August, 2015), it remains most densely populated country with over 1012 person per sq. kilometre except a few nation states in the world. This puts Bangladesh in the most high profile vulnerability index risk that the country faces indefinitely<sup>45</sup>.

The country's major hazards include recurrent flooding covering large areas upto 30 percent of the landmass with frequent cyclones or storm surges that hits the coasts of Bangladesh. One third of the country is also vulnerable to droughts often aggravated by manmade degradation of the environment, a feature observed globally.<sup>46</sup> Moreover river bank erosions results in substantial loss of people's farm land, livelihoods and destruction of infrastructures such as bridges and roads. Every year about 1 million people and about 9000 hectares of cultivable land get affected by riverbank erosion. Many of them migrate to urban areas and large proportion of the urban slum dwellers in Dhaka comes basically from the riverbank erosion areas.<sup>47</sup>

Bangladesh may not have been impacted any major **earthquake** in the recent past but it remains vulnerable as it lies in the earthquake prone zone. In the past 300 years four severe earthquakes has impacted the region, the most recent being the earthquake in 1999 in Bangladesh. Hugh

Brammer points out that if a similar earthquake of equal magnitude occurs in present day Bangladesh then it could be catastrophic due to urban buildings being constructed without paying proper attention to Building Code Regulations.<sup>48</sup>

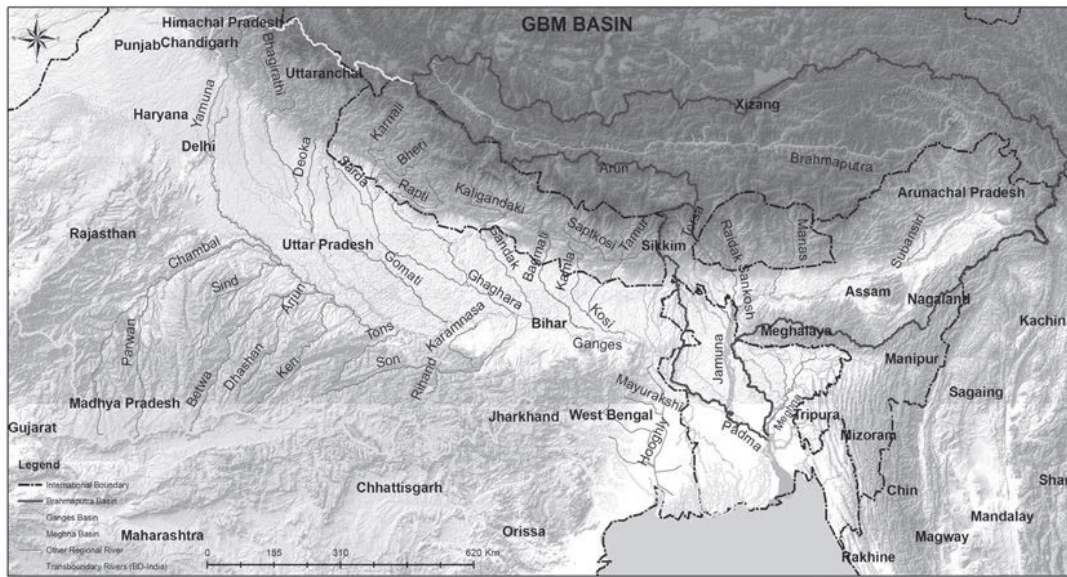
Besides a wide variety of natural hazards the two major natural hazards that turns into disaster and impacts the country to an extreme level causing large scale destruction, loss of lives and properties, causing major setback to development activities are cyclones and floods that occur regularly.<sup>49</sup> **Cyclones and storm surges** appears to be the most recurrent feature with increasing ferocity in the context of Bangladesh. Cyclones cause large scale damage to the environment and economic resources of the country. They damage crops, trees, livestock, housing infrastructure, land degradation, soil erosion and increases salinity of the soil that impacts agricultural productions. The cyclone of 1970 that hit the Noakhali coast nearly killed atleast 3,25,000 people as the national system of cyclone warning had not yet been structuralized and the casualties were far greater in number.

The cyclone of 1991 had a devastating effect that hit the south-eastern coast of Bangladesh (Chittagong). About 70 percent of the rural population in the coastal villages was affected despite early warnings and evacuation of nearly three million people<sup>50</sup>. The recent last two devastating cyclones Sidr (2007) and Aila (2009), particularly cyclone Sidr that struck the coast of Bangladesh on 15<sup>th</sup> November, 2007 resulted in the death toll of 3200 with about 35,000 thousand injured and an estimated 5.5 million people effected in the 28 of the 64 districts of the country with an economic loss of US \$ 1675 million, 1.4 million acres crop land wiped out and 352,000 livestock drowned<sup>51</sup>. Cyclone Aila that occurred on 25<sup>th</sup> May, 2009 had hit the south-

western part of Bangladesh (Khulna Division) and West Bengal a state of India killed 190 people, displaced over 2 million people, 1,00,000 livestock were killed and over 340,660 acres of crop land destroyed when people were still recovering from the earlier cyclone Sidr of 2007 that has devastated the lives of the people<sup>52</sup>.

**Floods** can be considered as the next major natural disaster that impacts Bangladesh<sup>53</sup>. In this context Hugh Brammer makes a clear differentiation between flood and flooding.<sup>54</sup> Bangladesh is subjected to floods due to its geo-physical location that makes it susceptible to annual occurrences becoming severe during the season of monsoon (July-August). Bangladesh is highly impacted by regular river floods affecting 28 percent of the country and increasing 68 percent in extreme years. Between the period of 1950-2000, sixteen major floods has impacted the territory that is now considered as Bangladesh.<sup>55</sup> Particularly the reported floods of 1988, 1998, 2004 and 2007 has been considered as most catastrophic in terms of large scale destruction and loss of lives.<sup>56</sup> An analysis of the deltaic flood plains of the GBM Basin reveals that the land Bangladesh occupies makes it subjected to regular floods as it lies in the catchment area of the GBM Basin which occupies 7.5 percent of this catchment area (130,000 kilometre square). In addition, the south-east flood plains an area approximately of 6000 kilometre square that lies outside the GBM catchment area is also subjected to floods.<sup>57</sup> (See map 3.6)

**Map 3.6 Ganga - Brahmaputra- Meghna River Basin**



**Source: Ref: Prasad, E. and Mukherjee, N. (2014). *Situation Analysis on Floods and Flood Management, Ecosystems for Life: A Bangladesh-India Initiative*, IUCN, International Union for Conservation of Nature and natural resources. Available at: <http://www.iucn.org/E4> [Accessed on 09 April 2014]**

Floods in Bangladesh is a result of a complex interrelated factors such as huge inflow of water from upstream as Bangladesh is a lower riparian country receiving huge amount of water downstream coinciding with heavy monsoon rainfall a low flood plain gradient including major rivers converging in Bangladesh. Added to this is the natural hazard of storm surges and cyclones in the coastal areas that inundates the low-lying coastal regions that gives rise to flood and flooding in Bangladesh.<sup>58</sup> Associated with this is the critical problem of a large size population and poverty in a small country. The pressure of population on national resources and fresh water has contributed to their over dependence at over exploitation. The impact of these disasters has been enhanced by the fact that about 40 percent of the population still lives below the poverty line (NDMP 2010)

**Climate change** has added a new dimension to the risk and vulnerabilities in Bangladesh. Bangladesh is one of the country at the top of Global Climate Risk Index (WDR, 2010).<sup>59</sup> The climate change threat of Bangladesh is related to development as its national economy strongly depends on agriculture and natural resources both of which are sensitive to climatic conditions such as change in rain pattern, floods, heat waves as well as rising sea level (The Stern Report, 2007).<sup>60</sup> The possible impact of rising sea level can pose adverse challenges for the country in near future requires sound management of disaster issues.<sup>61</sup>

The Centre for Research on Epidemiology of Disaster i.e. International CRED-EM-DAT database for Bangladesh shows top ten damage data of number of persons killed, effected and economic loss suffered by the country. The CRED Database estimates that between the period 1979-2008 over 191,415 people were killed and about 229 million people directly affected by natural disasters in Bangladesh. It also estimates the economic loss of US \$ 5.6 billion caused due to natural disasters.<sup>62</sup> **(See Annexure I: Table I A, Table I B, Table I C)**. A close analysis of disaster database provided by the Ministry of Food and Disaster Management (MoFDM), Government of Bangladesh presents a long list of 41 past disasters (floods, cyclones, erosion and others) covering the period of 1986-2009<sup>63</sup>. This database is much more informative and contains more detailed damage data then the CRED-EM-DAT Database.

A brief examination of all the data available from Ministry of Food and Disaster Management **(See Annexure II: Table II A, Table II B and Table II C)** reveals the fact that natural disasters particularly cyclones and floods cause immense damage agricultural activities and a consequent reduction in food supplies affecting not only the urban sectors but mostly impacting the rural



population who get directly affected by crop damage and loss of produce due to floods and cyclones.

### ***Disaster and Vulnerability Interface in Bangladesh***

Disasters result from the interaction of a disaster agent and a vulnerable population occurring at the interface of extreme natural events, social phenomena and human vulnerabilities. Disasters are more pervasive where human population occupies vulnerable position. Among the South Asian Countries Bangladesh has been most vulnerable to natural disasters due to high density of population and high incidence of poverty which has been highlighted to bring out the unsustainable pattern of development and human insecurities faced by the people at large.

Population plays a major factor in economic development of a country can be highly impacted by disaster events. The population of a country and its socio-economic demographic profile can be asset for a country and can also act as a negative factor that impacts developments and security of its people. The deltaic region of Bangladesh had led to rapid growth in population due to the highly fertile land and also leading to the longstanding concerns about population pressure that impacts economic development. Bangladesh being is a land-scarce country in terms of total land area use growing population is a huge pressure on land and natural resources of the country.

According to current projections if the present trend continues, then population increase of Bangladesh may be around 192.3 million by 2051 with per capita arable land as low as 250 square meter.<sup>64</sup> Bangladesh has been witness to population explosion in the last three decades. From the period of 1974-2001, the population doubled putting extreme pressure on the

development efforts carried by the Government (Bangladesh Bureau of Statistics 2003).<sup>65</sup> According to the Population Census of Bangladesh 2001, the total population was estimated to be 130 million. In 2011 the estimated population was 149 million and the projected population in 2051 will be 192 million<sup>66</sup>

**Table: 3.4 Population (Growth) Census 1974 – 2011: Bangladesh**

<i>YEAR</i>	<i>POPULATION IN MILLION</i>
<i>1974</i>	<i>76.4</i>
<i>1991</i>	<i>111.4</i>
<i>2001</i>	<i>130.4 (ADJUSTED CENSUS)</i>
<i>2011</i>	<i>149.4</i>
<i>2051 (Projected)</i>	<i>192.3 Million</i>

*Source: Ref: Bangladesh Bureau of Statistics, Statistical Year Book (2003), Bangladesh Bureau of Statistics (2011)--Population and Housing Census (2011), Ataharul Islam (2000) "Population Momentum in Bangladesh" Paper –7 CPD. Dhaka. [Accessed on 01 May, 2015]*

The expanding population makes Bangladesh a densely populated country compared to rest of the world (excluding Singapore) with average density of 1012 persons per square kilometer (sq. km.) or 2626 persons per square mile (square metre).<sup>67</sup> This puts a great pressure on natural resources land area use, migration and environment. Associated with this is the problem of natural calamities particularly regular flooding, periodic cyclones, droughts and other calamities that makes Bangladesh most vulnerable to natural disaster. The above data indicates that Bangladesh is overpopulated given the limited land availability and population pressure in relation to land.

The problem of urbanization has also increased the disaster risk and Bangladesh is considered as one of the countries of the world with high risk factor in relation to natural disasters. Research studies related to urbanization and increase disaster risk finds a co-relation tendency where

majority of the people at risk and loss due to disasters are determined more by the complex processes of urban development and governance.<sup>68</sup>

According to the United Nations-Habitat Report 2007 urban growth and disaster risks are statistically correlated. The urban centres with high population density are likely to be at high risk of mortality and the number of persons affected by any disaster events will eventually increase the economic loss and damage. Moreover the countries having high HDI ratio face low mortality rate in contrast to countries with low HDI ratio<sup>69</sup>. This increases the potential to disaster risk and impact is much higher in urban centres.

According to the World Disasters Report 2010, United Nations Population Division's projections has estimated that almost all the world's population growth in the next few decades will be in urban areas in low and middle-income nations. A high proportion of this urban growth would be in cities at risk from the increased frequency and intensity of extreme weather events and storm surges which is being likely to increase due to climate change.<sup>70</sup> Bangladesh is one of the seven developing countries in the Asian region experiencing rapid urbanization. By 2030 this urban population will be forty percent (40%) of the total population of Bangladesh.<sup>71</sup> with severe constrains arising due to climate change.

Rural-urban migration also causes increase in urban population and in some cities of Bangladesh this figure is as high as seventy percent (70%)<sup>72</sup>. The urban population of Bangladesh has increased from 20.87 million to about 30.46 million and this is about an increase of 46% between 1991-2001.<sup>73</sup> The highest densities of population are located in the statistical regions of Dhaka, Chittagong, Noakhali and Comilla all clustered along the Dhaka-Chittagong axis in the south east of the country. The highest rural densities of population are concentrated in the south-

eastern Dhaka, mainland Noakhali, central Chittagong and eastern Comilla. Dhaka with 10 million people has 7.7 percent of the total population. About 30 percent of the total population of Bangladesh is settled on 16 percent of the total area of the country<sup>74</sup>.

The process of urbanization is mainly concentrated in four large cities Dhaka, Chittagong, Khulna and Rajshahi. These are also major industrial centres with more than 60 percent of urban population living in these cities. Dhaka alone accommodates one-third of the total urban population and contributes 60 percent of the total gross domestic product (GDP)<sup>75</sup>.

Migration to urban centres has resulted in settlement of people on marginal lands with poor standard housing infrastructure. These urban cities are emerging as major centres of disaster risks. With unplanned urbanization and unregulated growth disaster risk in cities of Bangladesh is likely to increase the vulnerability of the people to disasters. The floods of 1988 and 1998 had exposed the vulnerability of the people in Dhaka and brought out the lack of preparedness capacity to deal with it.<sup>76</sup>

Poverty to a large extent impacts Bangladesh both at the societal level and economic level. The incidence of poverty is further aggravated due to natural disaster events. Research studies have pointed towards a co-relational link between poverty and floods in Bangladesh. Floods are a major cause of persistent poverty in Bangladesh. This presents a greater negative effect on the spatial incidence of poverty. These effects as argued by Amrita Dasgupta are especially strong in the short term in the immediate aftermath of major floods. There also appear to be long-term negative effects that have the potentiality to create “poverty traps”<sup>77</sup>.

The longer duration of stay of floods on land results in loss of crop production and impacts the lives and livelihood of the people tied to the flood plains creating poverty in the long run. Floods

can devastate the physical and social capital of societies and destroys the savings of poor households. In case of Bangladesh where floods are frequent and catastrophic in nature, the effects at times have been devastating in terms of human security as observed during the floods of 1988, 1998 and 2004.<sup>78</sup> The incidence of poverty makes people more vulnerable to disasters that continue to impact and grow with times. This co-relation is more visible in the urban –rural divide which impacts the overall national poverty structure. Since independence considerable progress has been made to reduce poverty but as Sadiq Ahmed, the noted economist points out that the incidence of rural poverty was around 50 percent (50%) compared to urban poverty around 37 percent (37%) in 2000<sup>79</sup>.

In a similar vein Murgai and Zaidi while analyzing poverty trends in Bangladesh state that despite progress in reducing the depth and severity of poverty, inequality rose considerably during the decade of 1990-2000.<sup>80</sup> The House Hold Expenditure (HES) survey data suggest an increase in inequality particularly in urban areas from 0.259 in 1991-1992 to 0.306 in 2000<sup>81</sup> (as measured by Gini coefficient). Even the incidence of poverty differs considerably across regions showing trends of largest number of poor living in Rajsahi, followed by Dhaka and Chittagong divisions. Urban centres such as Dhaka are more impacted due to influx of poor migrants from different parts of the country.<sup>82</sup>

The World Disasters Report 2010 also focuses on urban areas as centres of risks for disasters with higher degree of mortality in low-income nations compared to high – income nations due to the growth of urban population in cities is much higher in recent years and are at risk from the increased frequency and intensity of extreme weather events.<sup>83</sup> UN-Habitat data 2006-2007 shows that Bangladesh was home to 30 million slum dwellers in 2001, and 85 per cent of its

urban population lived in poverty that year.<sup>84</sup> This suggests that poor people are more vulnerable to natural calamities as reduction of poverty has been slow in low income economies as is the case in Bangladesh.

One of the mechanisms to reach the poor in rural areas as well as farmers in Bangladesh is through the micro-credit finance programme. The major objective of micro credit finance is to reduce poverty by generating self employment and providing small financial aid to cater to the needs of the poor and women. This has been more effective in rural areas than compared to urban centres in Bangladesh. The micro credit financing has been one of the major achievements in Bangladesh's economy carried out by non-governmental organizations. Particularly Grameen Bank and its policy of financing micro credit in rural areas and their role in development has been quite significant.<sup>85</sup>

### ***Natural Disaster Policy and Framework in Bangladesh***

To understand and mitigate the question of human (in) security arising out of vulnerabilities to natural disaster in Bangladesh it is pertinent to examine and explore the disaster management framework present in the country. Disaster not only affect and jeopardize the economic prospects, development and growth of a country it also places a heavy burden on the people, community and society as a whole. From the above analysis it is quite clear that the impact of disasters is all encompassing. The policies and mechanisms to deal with management of disasters must be all pervasive and holistic in nature so as to take into consideration disaster scenario, vulnerabilities and risks associated with disasters so that development becomes more sustainable that will securitize the lives of the people in relation to the state

The disaster management framework in Bangladesh has systematically evolved through the Five Year Plans, Annual Development Plans and other plans and policies to create an effective regime of management of disaster. The focus of national capacity building for disasters and its mitigation places increased emphasis on the reduction of human, economic and environmental costs of disasters. **The disaster management framework in Bangladesh is based on two components – the structural and non-structural components of mitigation**<sup>86</sup>. The structural mitigation involves physical constructions to reduce the possible impacts of hazards by building of dams, flood levies, embankments, evacuation shelters and earthquake resistant shelters.

The Government of Bangladesh has constructed (till 2003) 1841 cyclone shelters and 200 flood shelters<sup>87</sup>. In the last four decades 482 water and flood control projects have been implemented through which flood protection embankments totaling about 8200 kilometer, drainage channel of total length 3400 kilometer and 9000 sluice gates and regulators on different rivers and canals has been constructed as safety measures against inundation by tidal waves, storm surges and floods<sup>88</sup>. According to the Government of Bangladesh Report 2011 on Disaster Management Practice, about 2895 cyclone shelters and 200 flood shelters have been constructed to provide safe shelters to the people<sup>89</sup>

The non structural component of disaster mitigation involves knowledge and practice, imparting training, creating public awareness, preparing plans and policies, building legal instruments and mechanisms, creating and strengthening institutional arrangements to reduce disaster risk and vulnerabilities of the people. **The non- structural components of disaster mitigation in Bangladesh involves the (I) regulatory framework and (II) institutional framework.** The

regulatory framework includes preparation of national plans and disaster management policies, mechanism and strategies to mainstream disaster risk reduction in national planning and development and the institutional framework includes the administrative and organizational part of the disaster framework<sup>90</sup>. An in-depth analysis of the Regulatory Framework of Disaster Management brings out the two components: (a) National Plan, Disaster Management Policy and mechanisms to address disaster risk reduction (b) Legal framework of disaster management in Bangladesh. These two components are briefly being addressed below.

### ***(I) Regulatory Framework***

#### ***(a) National Plans, Policies and Mechanisms to Address Disaster Management in Bangladesh.***

In terms of policy initiative Bangladesh has been specifically working in the direction of disaster risk reduction and emergency response management. To fulfill this purpose it has developed and systematized the strategies and mechanisms to address the issue of disaster management through specific plans and policies that outlines the basic goals, conceptual framework and disaster management vision of the nation. The **National Plan for Disaster Management 2010-2015 (NPDM)** envisioned in April, 2010 has established the planning and regulatory framework, identified the priority areas for emergency response and disaster risk reduction that constitutes disaster management policy of Bangladesh<sup>91</sup>.

The NPDM was formulated on the basis of two earlier draft plan and policy notably called: (i) The Draft National Plan for Disaster Management (2007-2015)<sup>92</sup> that was translated into National Plan For Disaster Management 2010-2015 and (ii) The Draft National Disaster



Management Policy endorsed in January 2008<sup>93</sup> was prepared to spell out in detail the policy of the Government regarding disaster management. The following discussion describe in details the various plans and policies adopted for disaster risk reduction in Bangladesh. These are:

***i) National Disaster Management Policy 2008***

The National Disaster Management Policy brings forward the national policy on disaster risk reduction and emergency response management. It also describes the strategic policy framework and national principles for disaster management in Bangladesh. The national policy spells out the vision, mission and objectives regarding disaster risk reduction. The vision is to reduce the risk of the people, especially the poor and the disadvantaged, from the effects of natural, environmental and human induced hazards to a manageable and acceptable humanitarian level. The mission is to bring a paradigm shift in disaster management from conventional response and relief practice to a more comprehensive risk reduction culture. The objective is to strengthen the capacity of the system towards disaster management, to reduce risk, improve response and recovery at all levels of management of disasters<sup>94</sup>.

***ii) National Plan for Disaster Management 2010-2015***

The National Plan for Disaster Management 2010-2015 (NPDM) puts forward a simple model of disaster management that is based on two fundamental features which involves two elements of risk reduction and one element of emergency response. All the three elements of disaster management can be described as defining and redefining the risk environment, managing the risk environment and responding to the threat environment<sup>95</sup>.

The first element of the model establishes the components of the risk environment which includes social, political and community environment identifying the threats, risk and hazards, analyzing and evaluation hazard risks and risk treatment strategies. The resultant strategy being, managing the risk environment by ensuring prevention, preparedness, response and recovery program, being multi hazardous in perspective and focus to generate specific response. The third element responding to threats ensures that the officials associated with disaster management can clearly differentiate between risk reduction and emergency response so that response and recovery system that has been developed could be activated when required to respond to threats<sup>96</sup>.

An analysis of NPDM brings forward the detail and systematic structure outline for disaster risk reduction at all levels of governance. It provides a detailed framework of disaster management system consisting of the regulatory framework and the institutional framework (that will be addressed in detail later in the course of the chapter) with guidelines addressed for government departments and officials involving best practices for disaster risk reduction at all levels of governmental machinery.

The NPDM also helps in generating disaster management plans at the district and local levels of governance including upzilla, unions and paurashva or city corporation level. It has also addressed hazard specific multi-sectoral plans such as Earthquake Contingency Plan, Cyclone Shelter Plans, Disaster Resilient Cluster Housing and Tsunami Response Plan (after the December, 2004 Indian Ocean Tsunami)<sup>97</sup>. The Inter-Ministerial Disaster Management Co-ordination Committee (IMDMCC) will be responsible for monitoring the progress of the

implementation of the plan at the national level. The Disaster Management and Relief Division (DM&RD) working under Disaster Management Bureau (DMB) will be responsible for monitoring the implementation of the plan at the local level.

To specifically mention the strategies for the financing of the plan the Government has constituted two types of funding procedure: (a) National Disaster Response and Recovery Fund and (b) National Risk Reduction Fund generated through resources from the Government sectors and donations from external sources. The fund will be used for disaster mitigation programs, prevention and preparedness for disaster management.

The allocation and utilization of funds will be guided by the DM&RD in consultation with the Ministry of Finance to initiate the consolidation of existing risk reduction funds. Moreover the Five Year Plan documents will mainstream disaster risk reduction in its various projects and policies and allocate funds to the different sectors of the economy and ministries associated with the disaster risk reduction<sup>98</sup>.

### ***iii) Bangladesh Climate Change Strategy and Action Plan (BCCSAP) 2009***

Mainstreaming climate change for disaster risk reduction is one of the major policy initiatives into development planning of Bangladesh. In the context of Bangladesh climate change has acted as one of the major threat and vulnerable factor for the country. The major policy initiative is to address extreme environmental vulnerabilities to climate hazards within the national policy framework, and has recognized climate change as an environmental as well as developmental issue.

In terms of policy initiative the issue of climate change was first incorporated as one of the components of Comprehensive Disaster Management Program (2004-2009)<sup>99</sup> and the National Adaptation Program of Action (NAPA, 2005) after extensive consultations with the various stakeholders. The major policy initiative was taken with the Bangladesh Climate Change Strategy and Action Plan (BCCSAP) in 2008,<sup>100</sup> updated and revised in 2009 to provide the policy level strategic dimension to climate change issues in Bangladesh<sup>101</sup>.

The BCCSAP Document asserts that climate change possess a big challenge to sustaining economic growth and poverty reduction in the country. The vision of the State is to ensure human security through economic development of the people. To achieve this purpose there is a pro poor climate change management strategy which prioritizes adaptation and disaster risk reduction, mitigation, technology transfer, low carbon emission and mobilization of finances. The BCCSAP 2009 has six fundamental pillars<sup>102</sup> that guides the policy initiatives:

- To ensure food security, social protection including safe housing, employment and access to basic services including health to the poorest and most vulnerable section of the society including women and children.
- To strengthen the disaster management system, to deal with increasingly frequent and severe natural calamities.
- To ensure that existing infrastructures such as coastal and river embankments are well maintained and currently needed infrastructures such as cyclone shelters and urban drainage system built to deal with the impact of climate change.

- To ensure Research and Knowledge Management for predicting the scale and timing of climate change impacts on the economy and the people, and to ensure global linkages on the lines of best practices of climate change management.
- To develop low carbon emission options and mitigate the demand for energy for the growing economy
- To enhance capacity building and resilience to the challenges of climate change of the governmental agencies, civil society and private sector by mainstreaming them as part of development actions.

The major focus of the BCCSAP 2009 is to mainstream climate change strategy into development planning in Bangladesh by incorporating climate change into the Sixth Five Year Plan, the Annual Development Programs and other policy documents<sup>103</sup>. This policy initiative is a prominent feature of the document where the Bangladeshi Prime Minister Sheikh Hasina promises the commitment of the Government to address climate change<sup>104</sup>.

The Government through the Ministry of Environment and Forests has created two funding agencies – The Bangladesh Climate Change Trust Fund (BCCTF) and Bangladesh Climate Change Resilience Fund (BCCRF) to mitigate climate change project and programs. In the financial years 2009-2012 the Government has allocated US \$ 350 million from non development budget for implementing 107 projects in different vulnerable areas estimated to cost 1272 million Bangladeshi Taka (BT) as well as additional funding from donor partners worth US \$ 170 million<sup>105</sup>. The strategy is to integrate climate change, its impact and challenges into the

overall plans and policies addressing all sectors of the economy, reducing poverty and ensuring socio-economic development of the country.

Earlier to mitigate the disaster scenario the country had adopted the Comprehensive Disaster Management Program (CDMP): Phase I (2004-2009) with the support of donor partners to develop comprehensive plans and policies to mainstream disaster risk management within the planning process followed by Phase II of the programme (2010-2014).

***(iv) Comprehensive Disaster Management Program (CDMP): Phase I (2004-2009) and Phase II (2010-2014)***

The Comprehensive Disaster Management Programme (CDMP) was adopted by Government of Bangladesh with support from donor partners in two phases that reflected a more proactive approach towards disaster management including hazard identification and mitigation, community preparedness and integrated response efforts towards disasters<sup>106</sup>. The program was undertaken to strengthen the institutional structures guided towards management and disaster risk reduction.

The aim of the CDMP was to establish the mechanisms that would facilitate long term management of disasters, climate risk to environment and socio-economic development as part of national plan and development policy. It was developed as a high profile multi-hazard, multi-sector and multi-stakeholder program, by the Government of Bangladesh in collaboration with the United Nations Development Program (UNDP), the UK Department for International

Development (DFID) and the European Union, formally executed by the Ministry of Food and Disaster Management, Government of Bangladesh<sup>107</sup>.

The first phase of the program was initially funded by UNDP, DFID and United Nations Office for Project Services (UNOPS). Later European Union was included as the funding component that exhibits the elasticity of the funding options where multi-stakeholders were accepted in the course of running the program. The UNDP and UNOPS also served as the implementing partners of the program<sup>108</sup>. The main task of Phase I of the program was to create the institutional mechanism, strengthen the regulatory framework and capacity building.

Phase II was meant to build upon the foundations laid down by the First Phase to make it operational. The program initially started with seven pilot districts selected on the basis of their vulnerability to different types of hazards, later expanded to include nine more districts in June, 2008 following the floods of 2007 and cyclone Sidr 2007. By the end of Phase I it had been extended to thirty two districts likely to expand in the second phase to cover forty districts for capacity building at the community and household level<sup>109</sup>.

The outcome of CDMP led to the strengthening of the core components including the regulatory and institutional framework for disaster risk reduction in Bangladesh at the national, urban and local levels of governance. The program assisted the Ministry of Food and Disaster Management to produce revised Standing Orders on Disaster (2010), Disaster Management Act, 2012, National Plan for Disaster Management (2008-2015), SAARC Framework for Comprehensive Disaster Management (2006-2015), Draft Disaster Management Plan (2007-2015), Draft National Policy on Disaster Management (2008), National Disaster Management Policy (2010-

2015) and Policy Matrix on Comprehensive Disaster Management towards poverty reduction and growth as included in Poverty Reduction Strategy Papers I (2005-2008) and Poverty Reduction Strategy Papers II (2009-2011)<sup>110</sup>

The program contributed significantly in strengthening the institutional mechanism as well as in the establishment of Disaster Management Information Centre 2005, Climate Change Cell 2009, Community Risk Assessment (CRA) and Risk Reduction Action Planning guidelines (RRAP) and Local Disaster Risk Reduction Fund so that plans could be designed in order to be inclusive for all community members where scientific data and forecasts could be combined with local knowledge to form an overall accurate assessment of risk for the community concern.

The implementation of these policies and programs has been assisted by various disaster committees of Government of Bangladesh and the international and national NGOs working in this field. Moreover the Livelihood Adaptation Climate Change Program (LACCP) has been assisting farmers to adapt to climate change primarily focusing on areas prone to drought and saline intrusion<sup>111</sup>. All these programs have significantly contributed to capacity building of the nation to respond proactively to disaster and calamities.

The CDMP could be considered as an innovative program ahead of its time and unique at its operationalization with multi-hazard, multi-sector and multi-stakeholder approach designed prior to the conference (following the Tsunami of 2004) on disaster risk reduction held in Kobe, Japan in 2005 that led to the adoption of Hugo Framework for Action (HFA) 2005-2015 representing the highest benchmark for international effort in disaster management. The program has also



resulted in a paradigm shift in its approach towards disaster management from response and relief to mitigation and preparation towards disasters<sup>112</sup>.

The Phase II of the program was to be built upon the foundation of the Phase I which targeted more integration at the level of various sectors and ministries in order to guarantee a meaningful adoption of the risk reduction approach. The major drawback identified at the First Phase was limited analysis and intervention at the household level<sup>113</sup>. The emphasis of Phase II was to strengthen core elements of disaster management that can help reduce mortality, loss of property and livelihood. Disaster response and recovery planning must take into account the basic need of the poorest with the basic focus on entitlements of food security, shelter and other aspect of socio-economic security<sup>114</sup>

The major focus of Phase II is to integrate the risk of climate change into disaster management by strengthening capacity building at household and community level through Community Level Risk Assessment (CRA) and Risk Reduction Action Plan (RRAP) Program that ensures the involvement of the community through participatory process<sup>115</sup>. These programs act as a participatory and inclusive tool in bringing benefit at the community and household level by mainstreaming disaster risk reduction in cost effective manner in national plans and policies for long term sustainable development<sup>116</sup>.

### ***(b) Legal Framework of Disaster Management in Bangladesh***

The development of a legal framework for disaster risk reduction and emergency response in Bangladesh involves a complete detailed framework that has been generated to regulate and

guide activities associated with disaster management. Since independence Bangladesh has been in the process of implementing through its various Five Year Plans and Annual Development Plans starting from 1973 onwards till present to address the issue of disaster. The first legal instrument to specifically address the issue of disaster management in Bangladesh started with the adoption of Standing Order on Disaster in 1997 followed by a series of other legal instruments and policies. The legal framework in brief is presented below:

***i) Standing Orders on Disasters (SOD) 1997***

The Standing Orders on Disaster (SOD) was adopted in 1997 which was again revised in 2010 that reflected the shift in approach from “relief and rehabilitation” to a more “disaster risk reduction” approach in the revised orders to guide and monitor disaster activities. The SOD is a vast, detailed and main legal document of 208 pages that describes the role and responsibilities of the executives including the office of the Prime Minister and other administrative offices, relevant ministries, local self bodies at the grass root level to establish necessary actions required for implementation of disaster mitigation. The objective behind the preparation of SOD was to make the relevant persons and institutions to perform the duties and responsibilities regarding disaster management at all levels of governance<sup>117</sup>.

The document provides clearly spells out responsibilities starting from the National Disaster Management Council, the national apex body upto the local elected bodies to carry out their duties in these fields. The standing SOD has been revised to incorporate the disaster challenges that Bangladesh has to face time and again particularly after the floods of 2004 and 2007 and cyclone Sidr of 2007. The main task of generating response was carried by Disaster Management

Bureau (DMB) through a series of consultation from 900 representatives coming from all government ministries, representatives of non-government organisation, private sector, media and development partners who participated at the workshop to address disaster reduction issues in Bangladesh<sup>118</sup>.

### ***ii) The Allocation of Business (1996)***

The allocation of business 1996 is another legal matrix that guides the disaster management framework in Bangladesh. The Ministry of Food and Disaster Management according to the allocation of business sets out the mandate and roles for various ministries in relation to all task pertaining to ensuring food security as a part of disaster risk reduction strategy. The Ministry of Food and Disaster Management acts as the nodal agency that has the overall responsibility for coordinating national disaster management effort across all ministries, agencies and departments of government<sup>119</sup>. The Ministry of Food and Disaster Management was created in 2003 by amalgamating Ministry of Food and Ministry of Disaster Management and Relief Division. The Ministry of Food and Disaster Management is responsible for setting policy and planning for issues relating to overall food system, food policy regarding disaster risk reduction and emergency response management.

### ***iii) Disaster Management Act, 2012***

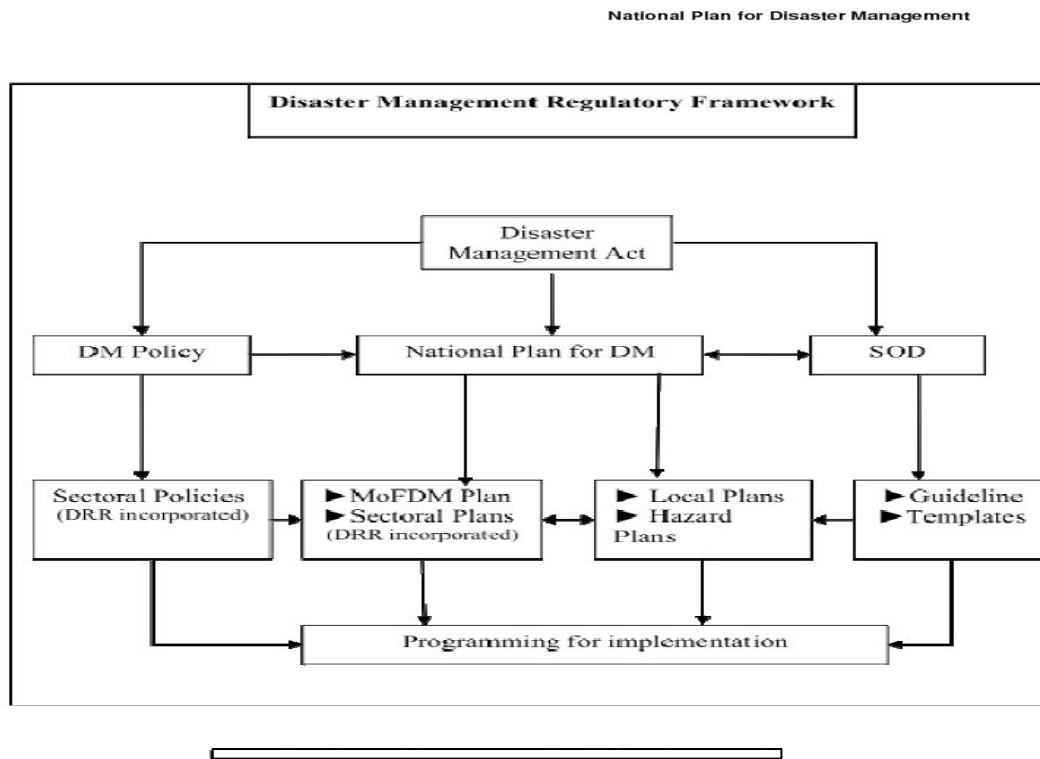
The Disaster Management Act of 2012 was passed by the Parliament of Bangladesh on 19<sup>th</sup> September, 2012 that became an Act by the assent of President on 24<sup>th</sup> September, 2012 This Act creates the legal framework that would guide the future disaster management system in

Bangladesh. The SOD was further consolidated with this Act that provided a solid legal foundation to work in mainstreaming disaster risk reduction in national plan and policies as well as in all the governmental sectors and institutions associated in this field of work<sup>120</sup>. The objective of the act are summarized as follows<sup>121</sup>

- a) To effectively respond and recover from the disaster or an emergency situation.
- b) To prepare the communities for managing the effects of a disaster event.
- c) To help communities to mitigate the potential adverse of hazard events.
- d) To adapt to adverse affects of climate change
- e) To provide for effective disaster management system in Bangladesh
- f) To establish an institutional framework for disaster management.
- g) To establish risk reduction as a core element of disaster management.

The Disaster Management Act, 2012 finally consolidated all the efforts made during all these years for disaster risk reduction in the context of Bangladesh. This Act provided for the systematization of disaster initiatives, policies, strategies and mechanisms as well as legal instruments adopted so far to guide disaster issues of the country. The following figure 4.1 provide a diagrammatic expression of the regulatory framework and the inter linkages of the various policy instruments adopted by the Government of Bangladesh for disaster management.

**Figure 3.1: Disaster Management Regulatory Framework of Bangladesh**



*Source: a) Ref: Government of Bangladesh (2007) – Draft National Plan for Disaster Management in Bangladesh (2007-2015). Disaster Management Bureau, Ministry of Food and Disaster Management Government of Bangladesh [Accessed on 03/05/2015] pp 50*

*b) Ref: Government of Bangladesh (2010). National Plan for Disaster Management (2010-2015). Disaster Management Bureau Ministry of Food and Disaster Management, Government of Bangladesh [Accessed on 16/05/2015] pp 43*

**(II) Institutional Framework for Disaster Management**

The Institutional Framework for Disaster Management in Bangladesh involves national level and sub-national level institutions associated with disaster management in Bangladesh. Since the 1990’s the State began a concerted effort to build the institutional capacity for disaster management in Bangladesh. This required a specialized permanent body to implement various

projects, plans and policies undertaken by the Government in collaboration with donor partners for disaster management in the country (particularly for floods and cyclones)<sup>122</sup>

This effort resulted in the creation of Disaster Management Bureau (DBM) in 1993 which currently operates under the Ministry of Food and Disaster Management. The Ministry of Food and Disaster Management acts as the nodal agency that coordinates and channelizes all activities regarding disaster management and the DBM acts specifically to develop the mechanisms related to disaster management to coordinate between legal framework and institutional arrangements for effective performance<sup>123</sup>.

An analysis on the disaster management system in Bangladesh reveals that the system represents a hierarchical structure from the national to the local level and each level being elaborately departmentalized to provide policy guidance towards disaster risk reduction and emergency response mechanism in Bangladesh<sup>124</sup>. The Government of Bangladesh working within its legal framework provides a pivotal role to bring into the coordinated efforts of the various departments of the Government, development partners,<sup>125</sup> non-governmental organizations and civil society organizations<sup>126</sup> working in this field. Following the floods of 1988 and cyclone of 1991 the DBM worked constructively to generate good practices associated with disaster risk management and emergency risk response<sup>127</sup>.

The institutional framework for disaster management in Bangladesh can be broadly divided at two levels (i) National Level Institutions and (ii) Sub-National Level Institutions which are inter-related to each other with spelt out duties and clearly define jurisdiction to discharge their roles and responsibilities as outlined in detail in SOD 2010<sup>128</sup>.

### ***i) National Level Institutions***

The institutions responsible for policy formulation, coordination and implementation of disaster management framework at the national level are guided by three most significant institutions<sup>129</sup>. These are (1) National Disaster Management Council (NDMC), (2) Inter-ministerial Disaster Management Co-ordination Committee (IMDMCC) and (3) National Disaster Management Advisory Council (NDMAC).

Besides there are seven other institutions and committees at the national level associated with the wide range of issues related to disaster management such as (4) National Platform for Disaster Risk Reduction (NPDRR), (5) Earthquake Preparedness and Awareness Committee (EPAC), (6) Cyclone Preparedness Program Implementation Board (CPPIB), (7) Disaster Management Training and Public Awareness Building Task Force (DMTPABTF), (8) Focal Point Operation Co-ordination Group of Disaster Management (FPOCG), (9) NGO Co-ordination Committee on Disaster Management (NGOCC) and (10) Committee for Speedy Dissemination of Disaster Related Warning Signals (CSDDWS)<sup>130</sup>.

### ***ii) Sub-National Level Institutions***

The institutions at the sub national level are responsible to coordinate disaster management activities from the district to the grass root level. There are five such committees that guide the framework at the local level<sup>131</sup>.

These are (a) District Disaster Management Committee (DDMC), (b) Upzilla District Management Committee (UZDMC), (c) Union Disaster Management Committee (UDMC), (d)

Pourashava Disaster Management Committee (PDMC), and (e) City Corporation Disaster Management Committee (CCDMC).

The **other institutional mechanisms** associated with disaster management for preparedness and response mechanism structure in Bangladesh<sup>132</sup> are (a) The Disaster Management Centre (DMC) that was established in 1993 to assist the Ministry of Disaster Management and Relief Division and the Government with information regarding emergency situation, warning and activation and co-ordination of emergency response, relief and recovery (b) the Government has also established the Emergency Operations Centre (EOC) for emergency response and gets activated with the first information of disaster.

The EOC receives the services of the armed forces. The Directorate of the Relief and Rehabilitation Division operates immediate response and relief for distribution in disaster affected areas. The non governmental organizations as well as civil society organizations are involved in the relief and rehabilitation operations during and after the disasters<sup>133</sup>.

There are other technically and scientifically oriented institutions that strengthen the disaster management framework of the country<sup>134</sup>. These are (a) Bangladesh Space Research and Remote Sensing Organization (SPRRSO) for providing early warning and satellite images of natural hazards turned into disasters (b) Bangladesh Meteorological Department (BMD) for forecasting natural disasters like cyclones, floods, droughts and storm surges (c) Flood Forecasting and Warning Centre (FFWC) for flood forecasting and information on floods working under the Bangladesh Water Development Board.



To build the resilience of the community and the household level a number of institutions are working at the national level for capacity building, dissemination of information, creating awareness and training – preparedness activities<sup>135</sup>. The most important institutions working in this direction are (a) Focal Point Operation Co-ordination Group of Disaster Management (FPOCG) which is chaired by the Director General of DBM and its associated with the co-ordination activities of various departments and agencies related to management of disasters. It also assists and reviews the contingency plan prepared by the concerned departments related to relief and rehabilitation work directed towards the community and household level

(b) Committee for Speedy Dissemination of Disaster related Warnings and Signals (CSDDWS). This committee is also chaired by the Director General of DBM that provides first hand information regarding disasters. It is also assigned with the task of examining and ensuring the ways and means to speedily disseminate the warnings and signals of upcoming disasters to the people.

(c) Disaster Management Training and Public Awareness Building Task Force (DMTPAFT). This institution was formulated according to the directives of the Standing Orders on Disasters to address the public awareness and training needs for disaster management in Bangladesh. The members of the training force represent various government officials, non-governmental organizations and members from civil society organization regularly attending the meetings so as to disseminate the information to build resilience of the people and community to disasters.<sup>136</sup> The Director General of the DBM is assigned with the task to co-ordinate the activities of government departments, NGOs and other stakeholders

(d) NGO Co-ordination Committee on Disaster Management (NGOCC) – at the community and household level the NGOs are working for creating awareness, training and preparedness from emergency and disasters. The NGOCC is also chaired by the Director General of DBM to coordinate and review the activities of the concerned NGOs and the Government working in the field of disaster management in the country.<sup>137</sup>

Against the above backdrop it becomes quite clear that Bangladesh has an elaborate system of disaster management framework hierarchical in structure to address the challenges of management of disasters. The main task of this elaborate system is to lay the framework of legal-institutional mechanisms to deal with disaster scenario, secure the lives of the people and to ensure financial investment for capacity building in disaster management sector.

### ***Natural Disaster Management and Five Year Plans: Bangladesh***

The Five Year Plans and Annual Development Plans also address the natural disaster management scenario in Bangladesh through policy matrix initiatives that works in the direction of disaster risk reduction. This task is carried in the form of allocation of funds for various plans and policies for disaster risk reduction by different ministries associated with the implementation of the programme for disaster risk reduction.

The disaster management framework, co-ordinates various disaster risk reduction programmes within the country. The five year plans play an important role to reduce the vulnerabilities of the people particularly the poor and the marginalized (women and children) so as to address the issues of human security and natural disaster.

Bangladesh being one of the worst affected countries of the world due to natural disasters had always faced problems within development in all its sectors. To ameliorate poverty and engage in growth and economic development Bangladesh since its independence has launched the successive Five Year Plans and Annual Plan Documents. Particularly the Bangladesh Planning Commission was established in January 1972 which was responsible for the formulation of Five Year Plans within the perspective of planning for development. The Constitution of Bangladesh, under Article 15 of the Constitution requires that the state follows the path of a planned economic growth for realizing its development objectives<sup>138</sup>.

In 1973-1978 the First Five Year Plan was launched to realize the dreams of Bango Bandho, the First Prime Minister Sheikh Mujibur Rehman. In between the periods of 1973-2002 Bangladesh has already implemented a total number of five – Five Year Plans. Again there was a two year gap between Fourth and Fifth Five Year Plan that was filled with Two Annual Development Plans of 1995-1996 and 1996-1997<sup>139</sup> followed by the Sixth Plan covering the period 2011-2015. In the last forty years Bangladesh has adopted altogether six Five Year Plans.

The following Table (no. 3.5) gives a detailed description of the planned expenditure and Gross Domestic Product (GDP) growth rate covering the plan period from 1973-2015. The projected growth rate for the financial year was estimated at 8.0 percent of the GDP and the annual realized growth rate stands at 6.7 percent in the financial year 2011 as pointed out in the Sixth Planned Document, Part III with detailed statistical data<sup>140</sup>.

**Table 3.5: Plan expenditure and GDP Growth Rate Form the Plan Period (1973-2015): Bangladesh (at respective base year prices) ( in million rate)**

<i>Plan Periods</i> (1)	<i>Plan Size (In Million Taka)</i>			<i>Estimated Actual Expenditure</i>			<i>Growth Target</i>	<i>Realized Growth</i>
	<i>Total (2)</i>	<i>Public (3)</i>	<i>Private (4)</i>	<i>Total (5)</i>	<i>Public (6)</i>	<i>Private (7)</i>	<i>% (8)</i>	<i>% (9)</i>
<i>1<sup>st</sup> Five –Year Plan (1973-78)</i>	44,550	39,250	5,030	20740	16,350	4,390	5.50	4.00
<i>Two Year Plan (1978-80)</i>	38,610	32,610	6,000	33,590	24,020	9,570	5.60	3.50
<i>2nd Five –Year Plan (1980-85)</i>	172,000	111,000	61,000	152,970	103,280	49,690	5.40	3.80
<i>3rd Five –Year Plan (1985-90)</i>	386,000	250,000	136,000	270,110	171,290	98,820	5.40	3.80
<i>4th Five –Year Plan (1990-95)</i>	620,000	347,000	273,000	598,480	274,083	324,397	5.00	4.15
<i>5th Five –Year Plan (1997-2002)</i>	1,959,521	858,939	1,100,582	N/A	N/A	N/A	7.00	5.50
<i>6th Five –Year Plan (2011-2015)</i>	13,500,000	3,100,000	10,400,000	N/A	N/A	N/A	8.00	6.7 (FY 2011)

*Source: Ref: 1) Planning Commission, Government of Bangladesh. Fifth Five Year Plan (1997-2002) and Sixth Five year Plan (2011-2015) [Accessed on 29 May 2015] Also Ref: Bangladesh Bureau of Statistics Report for respective years*

During the period that followed the Fourth Plan and which ended in 1995 some important measure were taken for environmental security with the adoption of National Environment Policy in 1992 initiating a National Environment Management Action Plan (NEMAP) and

enacted the Environment Conservation Act, 1995 that made environmental clearance mandatory for industrial projects.

The Fifth Five Year Plan<sup>141</sup> (1997-2002) came up with an all-inclusive strategy for poverty reduction that addressed three major elements (a) pro-poor plan for addressing rural poverty (b) an indicative strategy for poverty alleviation and (c) an outline program for institutional development at local level for implementing the pro-poor project. The Fifth Five Year Plan also made a significant contribution for sustainability by addressing for the first time the sustainable development agenda in national plans and policies. During the Fifth Five Year Plan 1997-2002 the sustainable environment management project (SEMP) – towards implementing sustainable development initiatives for protecting environmental degradation, climate change and disaster management.

The Sixth Plan was adopted by the National Economic Council with Prime Minister Sheikh as the Chairperson of the Council on 29<sup>th</sup> May, 2009 for the period 2011-2015.<sup>142</sup> The General Economic Division of the Planning Commission of Bangladesh is mandated to prepare the Five Yearly National Plan for development.

Particularly from the Fifth Plan onwards allocation of funds were made ministry wise and sector wise for areas covering environment, forestry, climate change and disaster management. The following Table 3.6 shows public expenditure allocation for the financial years covering the period from 2005-2011 for Ministry of Food and Disaster Management

**Table 3.6: Public Expenditure Allocation for Ministry of Food and Disaster Management (2005-2011): Bangladesh**

<i>Public Expenditure Allocation for Five Year Plan (2005-2011) for Ministry of Food and Disaster Management. Government of Bangladesh</i>	
<i>Ministry of Food and Disaster Management</i>	<i>Allocation (in Crore Bangladesh Taka)</i>
<i>Financial Year 2005</i>	<i>520.01</i>
<i>Financial Year 2006</i>	<i>428.00</i>
<i>Financial Year 2007</i>	<i>138.00</i>
<i>Financial Year 2008</i>	<i>626.30</i>
<i>Financial Year 2009</i>	<i>1439.20</i>
<i>Financial Year 2010</i>	<i>1574.70</i>
<i>Financial Year 2011</i>	<i>539.00</i>

*Source: Ref: Bangladesh Sixth Five Year Plan. Part 3, Statistical Annexure Technical Framework (2011-2015), General Economic Division, Planning Commission, Ministry of Planning, Government of Bangladesh. [Accessed on 29 May, 2015]*

The current Sixth Plan has a separate budgetary projection of allocation of funds for broad sectors of the economy included in the Plan Period. An analysis of the Sixth Plan shows that in Part I, Chapter 8 of the Plan, a separate section has been created for addressing “Environment, Climate change and Disaster Management for sustained Economic Development”.<sup>143</sup> The main objective of the Plan Period is to lessen the negative impacts of the environment degradation, mainstreaming of poverty – environment – climate related issues into the institutional mechanism of Planning Commission, Ministry of Planning, Ministry of Finance and Ministry of Forest and Environment. It is vital for sustainable development to be mainstreamed into these institutions to generate pro-poor decisions, policies and investments to address human security issues.

The following Table No. 3.7 gives a detailed budgetary projection of broad sectors of the economy as outlined in the Sixth Plan including allocation for environment, climate and disaster management sector which shares four percent of the total allocated sectoral fund for development.

**Table 3.7: Sixth Plan Sectoral Public Investment Allocation Plan Projection (2011-2015): Bangladesh (Crore Bangladesh Taka; Current Price)**

<i>Broad Sectors SFYP Classification</i>	<i>FY 2011</i>	<i>FY 2012</i>	<i>FY 2013</i>	<i>FY 2014</i>	<i>FY 2015</i>	<i>Total SFYP</i>	<i>Share %</i>
<i>Agriculture</i>	3623	4431	5217	6351	7474	27095	8.70
<i>Manufacturing</i>	702	812	893	1049	1193	4650	1.50
<i>Energy</i>	6075	8582	10274	12910	15747	53588	17.30
<i>Transport</i>	5370	7689	9371	11846	14506	48783	15.70
<i>Urban</i>	8578	10084	11445	13441	15291	58839	19.00
<i>Knowledge Economy</i>	434	519	595	705	807	3060	1.0
<i>Education</i>	5544	7158	8717	10925	13297	45461	14.70
<i>Health, Population and Nutrition</i>	3473	4499	5404	6823	8361	28560	9.20
<i>Poor and Vulnerable</i>	444	497	576	691	798	3006	1.00
<i>Environment and Disaster Management</i>	1667	2164	2381	2844	3267	12324	4.00
<i>Public Administrator and others</i>	3704	4206	4749	5497	6206	24363	7.90
<i>Total</i>	39615	50641	59620	73083	86948	309907	100

*Source: Ref: Sixth Five Year Plan Projections (2011-2015) Planning Commission (2012) General Economic Division Ministry of Planning, Government of Bangladesh Sixth Five Year Plan Final Report (2012) [Accessed on 10 July, 2015] pp 107*

The nodal agency for implementing the Annual Development Program and Five Year Plan is the Planning Commission. The Ministry of Finance provides for the non-development budget that is being allocated for socio-economic development of the country. While analyzing the funds allocated for the Sixth Plan Period it becomes quite clear that the programs associated with floods, cyclone management and climate related activities upto four percent of the GDP is spent on this sector as well as between 20-25 percent of government expenditure is spent on programs associated with climate change activities<sup>144</sup>. Since disaster management is one of the major concern of Government of Bangladesh, to achieve this objective the Government of Bangladesh has set forth Disaster Management Vision in its Sixth Plan Period (2011-2015) to reduce the risk of people especially the poor and the disadvantaged from the effects of natural, environment and human induced hazards, to a manageable and acceptable humanitarian level and to have in place an efficient emergency response system capable of handling large scale disaster.<sup>145</sup>

The strategy of the Sixth Five Year Plan is to carry forward the implementation of the approved National Plan for Disaster Management (2011-2015). The Disaster Management Model as mentioned in the Sixth Plan focuses on two interrelated aspects i.e. Disaster Risk Reduction and Emergency Response to build a comprehensive disaster management system in Bangladesh. Recognizing the significance of the impacts of natural disasters, the Government has also responded by generating the Poverty Reduction Strategy Papers (2005-2008) which contains a detailed policy matrix towards poverty reduction and sustainable economic growth which the Government adopted as National Strategy for Accelerated Poverty Reduction (NSAPR) in 2005).<sup>146</sup> This in turn would secure some of the concerns of human security and development.



The current policy for Poverty Reduction Strategy Papers II (2009-2011) also recognizes recurrent natural disasters aggravated by climate change as a major factor of vulnerability of the people. This new policy matrix is designed around five strategic blocks and supporting strategies with block IV focusing on disaster management and social safety nets. The main objective of Poverty Reduction Strategy Papers is to reduce poverty by 50% till 2015 to achieve the millennium development goals<sup>147</sup> that has been incorporated into various development plans to achieve sustained economic growth.

To complement this development perspective in the Sixth Five Year Plan it has also incorporated the implementation of Vision 2021 that aims at achieving overall development and growth, ensuring food and energy security with reduction in poverty and employment generation. The Vision 2021 is also to include issues of human development such as education, health and nutrition, effective population control, progress in science and technology, building digital Bangladesh and protection of civil and political rights simultaneously for the fulfillment of economic and social rights so as to achieve long term sustainable development.<sup>148</sup>

The above scenario presents a clear picture that Bangladesh has a long experience of natural disaster challenges and mitigation efforts required to deal with the extreme situations of disasters. The government expenditure on disaster management has increased in all these years. Yet the amount is negligible compared to post disaster reconstruction required on massive scale with support coming in the form of soft loans from multi-lateral financial institutions<sup>149</sup>. There is surely a large gap to be fulfilled regarding existing arrangement of financing disaster management in Bangladesh.

To substantiate a broad understanding on the above discussion and as a part of the study, a structured questionnaire survey was circulated to bring out the opinion of various respondents to issues related to disaster, development and human security in Bangladesh. It was observed during analysis on the issue of being faced with the perennial problem of natural disaster and poverty among the South Asian states, most of the respondents agreed that Bangladesh is highly impacted by disaster events and the incidence of poverty increase with each disaster. About 95% of the respondents agreed that Bangladesh is highly impacted by disaster events and the incidence of poverty increase with each disaster event. Hence there is a close link between natural disaster and poverty in Bangladesh. Only 5% of the respondents felt that poverty is not driven by natural disasters as there are other problems of development.

On the issue of incorporating disaster related issues in national development plans and policies in Bangladesh the opinion elicited by 72% of the respondents was in the affirmative category while 28% were in the negative category. This shows that Bangladesh to some extent has been able to deal with the regulatory and institutional setup of disaster management framework. On the role of the state in Bangladesh in addressing disaster vulnerabilities, 55% of the respondent felt that to a greater extent that the state plays a major role in addressing disaster vulnerabilities in Bangladesh. The state to a great extent has been able to incorporate disaster issues for mainstreaming in planning and development.

In **conclusion** it can be stated that the disaster management framework in Bangladesh has undergone a significant transformation. After the major disaster events in the 1990's followed by the Indian Ocean Tsunami 2004 a process of change has been witnessed in disaster management

approach particularly resulting a shift in paradigm from the conventional response of relief and rehabilitation to a more holistic approach of comprehensive risk reduction and ensuring the resilience of the community to the hazards both natural and manmade.

This was also in consistent with the Yokohama Strategy and “Plan of Action for a Safer World” 1994 and the Hyogo Framework for Action (2005-2015) that brought about changes in the overall disaster management strategy which was to link natural disaster, sustainable development and human security. The international exercise to build the disaster management frame work has been integrated into various plans and policies, legal instruments and institutional arrangements. Bangladesh is a signatory to the Hyogo Framework for Action (2005-2015) and has commitments to develop a framework emphasizing disaster risk reduction and strengthening emergency response mechanism. Further being part of the South Asian region the country has also joined the SAARC Framework of Action (2006-2015) for Comprehensive Disaster Management and Emergency Preparedness. Included in this process is the support of various multilateral organizations, international and national non-governmental organizations that are playing a significant role in this direction.

The disaster management framework in Bangladesh has been moving towards a more workable system to address disaster issues with the integration of regulatory, legal and institutional framework within the ambit of planned documents.

Against the above backdrop the working of the existing arrangements of disaster management framework in the country would be explored and understood in the light of case studies taken up in the next section of the study.

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## ANNEXURE - I

*Table I A: Top 10 Natural Disaster in Bangladesh for the period 1900 to 2014 sorted by number of persons killed.*

<i>Disaster Type</i>	<i>Date</i>	<i>No. Killed (Sorted by number of persons killed)</i>
<i>Drought</i>	<i>1943</i>	<i>1,900,000</i>
<i>Epidemic</i>	<i>1918</i>	<i>39300</i>
<i>Storm</i>	<i>12 Nov 1970</i>	<i>300,000</i>
<i>Storm</i>	<i>29 Apr 1991</i>	<i>138,866</i>
<i>Storm</i>	<i>Oct 1942</i>	<i>61,000</i>
<i>Flood</i>	<i>Jul 1974</i>	<i>28,700</i>
<i>Storm</i>	<i>28 May 1963</i>	<i>22,000</i>
<i>Storm</i>	<i>24 May 1985</i>	<i>15,000</i>
<i>Storm</i>	<i>June 1965</i>	<i>12,047</i>
<i>Source: Bangladesh Disaster Data. CRED-EM-DAT.BE Universite Catholique de Louvain. Brussels. Belgium. [Accessed 18 November, 2014]</i>		

## ANNEXURE - I

*Table I B: Top 10 Natural Disaster in Bangladesh for the period 1900 to 2010 sorted by number of persons affected*

<i>Disaster type</i>	<i>Date</i>	<i>No. of persons affected</i>
<i>Flood</i>	<i>June 1988</i>	<i>45,000,000</i>
<i>Flood</i>	<i>July 1974</i>	<i>38,000,000</i>
<i>Flood</i>	<i>20 June 2004</i>	<i>36,000,000</i>
<i>Flood</i>	<i>May 1984</i>	<i>30,000,000</i>
<i>Flood</i>	<i>22 July 1987</i>	<i>29,700,000</i>
<i>Drought</i>	<i>July-1983</i>	<i>20,000,000</i>
<i>Flood</i>	<i>July 1968</i>	<i>15,889,616</i>
<i>Storm</i>	<i>11 May 1965</i>	<i>15,600,000</i>
<i>Storm</i>	<i>29 Apr 1991</i>	<i>15,438,849</i>
<i>Flood</i>	<i>5 July 1998</i>	<i>15,000,050</i>
<i>Source: Bangladesh Disaster Data. CRED-EM-DAT.BE Universite Catholique de Louvain. Brussels. Belgium [Accessed 18 November, 2014]</i>		

## ANNEXURE - I

*Table I C: Top 10 Natural Disaster in Bangladesh for the period 1900 to 2010 sorted by economic damage cost affected*

<i>Disaster type</i>	<i>Date</i>	<i>Damage Cost (US \$)</i>
<i>Flood</i>	<i>5 July 1998</i>	<i>4,300,000</i>
<i>Storm</i>	<i>15 Nov 2007</i>	<i>2,300,000</i>
<i>Flood</i>	<i>20 July 2004</i>	<i>2,200,000</i>
<i>Flood</i>	<i>June 1988</i>	<i>2,137,000</i>
<i>Storm</i>	<i>29 Apr 1991</i>	<i>1,780,000</i>
<i>Storm</i>	<i>15 May 1995</i>	<i>8,00,000</i>
<i>Flood</i>	<i>Aug 1987</i>	<i>7,27,500</i>
<i>Flood</i>	<i>July 1974</i>	<i>5,79,200</i>
<i>Flood</i>	<i>Sep 2000</i>	<i>5,00,000</i>
<i>Earth Quake</i>	<i>26 Dec 2004</i>	<i>5,00,000</i>
<i>Source: Bangladesh Disaster Data. CRED-EM-DAT.BE Universite Catholique de Louvain. Brussels. Belgium. [Accessed 18 November, 2014]</i>		

## ANNEXURE - II

**Table II A: List of past 41 Disasters in Bangladesh. (Government OF Bangladesh 1986-2010) Sorted By Number Death Of People And Livestock Affected**

<i>Sl. No.</i>	<i>Year</i>	<i>Disaster</i>	<i>No. Affected</i>				<i>No. of Dead People</i>	<i>No. of Dead Livestock</i>
			<i>District</i>	<i>Upazlla</i>	<i>Family</i>	<i>People</i>		
1	1986	<i>Flood/Erosion</i>	19	175	<b>1,678,934</b>	6,715,734	57	42,374
2	1987	<i>Flood/Erosion</i>	-	-	-	24,823,376	1,470	370,129
		<i>Flood/Erosion</i>	<b>50</b>	<b>347</b>	-	-	-	-
3	<b>1988 (1st)</b>	<i>Flood/Erosion</i>	23	165	-	8,937,724	104	49,976
4	<b>1988 (2nd)</b>	<i>Flood/Erosion</i>	52	345	-	35,732,336	1,517	348,042
5	1989	<i>Flood/Erosion</i>	27	70	-	1,848,389	23	51,548
6	1990	<i>Flood/Erosion</i>	17	58	-	1,383,360	41	8,716
7	1991	<i>Flood/Erosion</i>	7	35	-	2,293,445	91	5,551
8	1991	<i>Flood/Erosion</i>	23	97	-	34,104,041	30	6,428
9	1991	<i>Flood/Erosion</i>	28	170	-	5,582,355	697	34,327
10	1993	<i>Flood/Erosion</i>	33	224	-	11,559,586	162	29,512
11	1994	<i>Flood/Erosion</i>	15	40	-	553,467	10	8,666
12	1995	<i>Flood/Erosion</i>	40	259	-	16,382,922	137	14,221
13	<b>1995</b>	<i>Flood/Erosion</i>	22	88	-	5,806,950	56	41,816
14	1995	<i>Flood/Erosion</i>	14	100	-	4,007,310	53	2,063
15	1996	<i>Flood/Erosion</i>	48	222	1,650,054	8,106,988	76	47,946
16	1997	<i>Flood/Erosion</i>	37	180	888,336	5,008,868	125	4,726
<b>17</b>	<b>1998</b>	<i>Cyclone</i>	<b>52</b>	<b>366</b>	<b>5,711,962</b>	<b>30,916,351</b>	<b>918</b>	<b>26,564</b>
18	1970	<i>Cyclone</i>	5	99	-	1,100,000	470,000	-
19	1985	<i>Cyclone</i>	9	30	-	167,500	10	2,020
20	1986	<i>Cyclone</i>	7	30	-	238,600	12	1,050



21	1988	<i>Cyclone</i>	21	131	-	1,006,536	9,590	386,766
22	1989	<i>Cyclone</i>	33	71	-	346,087	573	2,065
<i>Sl. No.</i>	<i>Year</i>	<i>Disaster</i>	<i>No. Affected</i>				<i>No. of Dead People</i>	<i>No. of Dead Livestock</i>
			<i>District</i>	<i>Upazlla</i>	<i>Family</i>	<i>People</i>		
23	1990	<i>Cyclone</i>	39	127	-	1,015,866	132	5,326
24	1991	<i>Cyclone</i>	33	100	-	121,229	76	25
25	1991	<i>Cyclone</i>	19	102	-	13,798,275	138,882	1,061,029
26	1994	<i>Cyclone</i>	2	8	-	422,020	134	1,296
27	1995	<i>Cyclone</i>	28	67	-	305,953	91	1,838
28	1996	<i>Cyclone</i>	2	9	16,520	81,162	545	4,933
29	1997	<i>Cyclone</i>	10	66	743,467	3,784,916	127	7,960
30	1997	<i>Cyclone</i>	12	61	374,583	2,015,669	78	3,196
32	1999	<i>Flood/Erosion</i>	28	-	1,084,593	4,338,372	15	137
33	2000	<i>Flood/Erosion</i>	9	40	811,144	3,244.58	37	1,643
34	2002	<i>Flood/Erosion</i>	36	209	1,949,940	7,606,837	26	25,237
35	2003	<i>Flood/Erosion</i>	31	189	1,522,248	7,582,792	96	6,992
36	2003 (2nd)	<i>Flood/Erosion</i>	5	20	55,781	291,673	8	205
37	2004	<i>Flood/Erosion</i>	39	265	7,468,128	36,337,944	747	15,143
38	2007	<i>Landslide</i>	1	15 (Places)	-	-	127	-
39	2007	<i>Flood/Erosion</i>	46	263	2,851,559	13,343,802	970	1,459
40	2007	<i>Cyclone (Sidr)</i>	30	200	2,064,026	8,923.26	3,363	1,778,507
41	2009	<i>Cyclone (Aila)</i>	11	64	948,621	3,928.24	190	150,131

Source: Ref: a) Government of Bangladesh (2010) – List of past 41 Disasters in Bangladesh. Disaster Management Bureau. Ministry of Food and Disaster Management. Government of Bangladesh, Dhaka. Accessed on 03/05/2015

b) Government of Bangladesh (2010) – Children and Disaster Risk Reduction. Background paper by Bangladesh. Ministry of Home and Children Affairs. Government of Bangladesh, Dhaka. [Accessed on 03 May, 2015]

## ANNEXURE - II

**Table II B: List Of Past 41 Disasters In Bangladesh. (Government Of Bangladesh 1986-2010  
Sorted By Economic Damages Cost**

Sl. No.	Year	Disaster	No. of Houses Damaged (Fully)	No. of Houses Damaged (Partially)	No. of Damaged Institution (Fully)	No. of Damaged Institution (Partially)	Road Damaged Fully (Km)	Road Damaged Partially (Km)	No. of Damages Bridge /Culvert	Embankment Damages
1	1986	Flood/Erosion	196,803	279,212	302	454	3,094	1,610	164	13
2	1987	Flood/Erosion	71,572	1,691,104	1,155	2,583	12,624	11,534	3,429	1,272
		Flood/Erosion	-	-	-	-	-	-	-	-
3	1988 (1st)	Flood/Erosion	120,530	270,632	287	1,100	1,202	5,659	312	67
4	1988 (2nd)	Flood/Erosion	1,030,659	2,265,776	2,593	6,506	45,840	14,016	2,397	1,651
5	1989	Flood/Erosion	3,203	16,096	58	689	289	2,195	4	-
6	1990	Flood/Erosion	14,101	58,418	239	387	171	1,210	123	125
7	1991	Flood/Erosion	33,961	80,994	239	1,196	624	1,195	392	339
8	1991	Flood/Erosion	73,449	121,518	115	884	176	2,157	249	124
9	1991	Flood/Erosion	232,633	370,934	350	1,199	892	5,567	1,774	186
10	1993	Flood/Erosion	234,393	615,336	32	2,608	4,367	12,217	2,175	1,013
11	1994	Flood/Erosion	19,177	31,005	346	103	60	475	9	18
12	1995	Flood/Erosion	344,276	1,087,419	168	5,882	4,146	1,981	2,335	2,398
13	1995	Flood/Erosion	79,725	355,386	650	1,744	2,170	3,643	537	211
14	1995	Flood/Erosion	474,707	571,222		1,431	2,565	7,839	1,567	267
15	1996	Flood/Erosion	218,275	598,818	292	2,968	1,635	10,922	1,573	448
16	1997	Flood/Erosion	13,252	241,147	196	976	3,490	4,210	811	586
17	1998	Cyclone	980,571	2,446,395	1,718	23,272	927	45,896	6,890	4,528

Sl. No.	Year	Disaster	No. of Houses Damaged (Fully)	No. of Houses Damaged (Partially)	No. of Damaged Institution (Fully)	No. of Damaged Institution (Partially)	Road aged Dam Fully (Km)	Road Damaged Partially (Km)	No. of Damages Bridge /Culverts	Embankment Damages
18	1970	Cyclone	-	250	-	-	-	-	-	-
19	1985	Cyclone	10,095	7,135	-	-	32		II	10
20	1986	Cyclone	1,116	3,446	2	47	132			I
21	1988	Cyclone	788,715	863,837	2,442	5,444	515	976	39	18
22	1989	Cyclone	73(,12	20,008	74	166	-	-	-	-
23	1990	Cyclone	75,085	63,562	233	461	-	-	-	-
24	1991	Cyclone	34,791	20,274	62	151	-	-	-	-
25	1991	Cyclone	819,608	882.75	3,865	5,801		764	496	707
26	1994	Cyclone	52,057	17,476	96	98	169		83	97
27	1995	Cyclone	22,395	44,664	127	537	-	-	-	-
28	1996	Cyclone	15,868	15,976	85	64	174	-	-	-
29	1997	Cyclone	290,320	452,886	1,824	3,000	218	1,527	527	122
30	1997	Cyclone	51,435	163,352	2,500	2,256	15	2,379	85	280
32	1999	Flood/Erosion	138,076 .	426.695	-	-	-	-	-	-
33	2000	Flood/Erosion	437,050	309.775	41	1,777	409	8,874	1,234	118
34	2002	Flood/Erosion	115,511	564,527	302	4.05	3.72	15.69	9,40.;	4.734
35	2003	Flood/Erosion	97.671	509,477	288	3,588	1,925	15.096	2.39	1.504
36	2003 (2nd)	Flood/Erosion	11.476	32.511	52	202	94	397	26	31
37	2004	Flood/Erosion	894,954	3,389,101	1,295	24,276	14,271	45,528	5,478	3,158
38	2007	Landslide	-	-	-	-	-	-	-	-
39	2007	Flood/Erosion	81,817	961,420	563	8,031	3,705	27.125	360 (Fully)	88(Fully)
40	2007	Cyclone (Sidr)	564,967	957,110	4,231	12,723	1,714	6,361	1.687	1.875
41	2009	Cyclone (Aila)	243191	370,587.000	445	4588	2233	6.621	157	1.742.53

*Source: Ref: a) Government of Bangladesh (2010) – List of past 41 Disasters in Bangladesh. Disaster Management Bureau. Ministry of Food and Disaster Management. Government of Bangladesh, Dhaka. [Accessed on 03 May, 2015]*

*b) Government of Bangladesh (2010) – Children and Disaster Risk Reduction. Background paper by Bangladesh. Ministry of Home and Children Affairs. Government of Bangladesh, Dhaka. [Accessed on 03 May, 2015]*

## ANNEXURE - II

*Table II C: Impact of Natural Disasters On Agricultural Sector (1986-2010)*

<i>Sl. No.</i>	Year	<i>Disaster</i>	Crops Damages (Acre)Fully	Crops Damages (Acre)Partially
<i>1</i>	1986	<i>Flood/Erosion</i>	990,573	711,616
<i>2</i>	1987	<i>Flood/Erosion</i>	2,983,362	1,873,207
<i>3</i>	<i>1988 (1st)</i>	<i>Flood/Erosion</i>	755,740	90,469
<i>4</i>	<i>1988 (2nd)</i>	<i>Flood/Erosion</i>	258,~36	9,902,967
<i>5</i>	1989	<i>Flood/Erosion</i>	58,568	102,716
<i>6</i>	1990	<i>Flood/Erosion</i>	37,987	125,089
<i>7</i>	1991	<i>Flood/Erosion</i>	276,896	117,795
<i>8</i>	1991	<i>Flood/Erosion</i>	160,549	239,024
<i>9</i>	1991	<i>Flood/Erosion</i>	782,780	708,225
<i>10</i>	1993	<i>Flood/Erosion</i>	778,513	521,204
<i>11</i>	1994	<i>Flood/Erosion</i>	55,325	48,133
<i>12</i>	1995	<i>Flood/Erosion</i>	1,369,358	986,754
<i>13</i>	<i>1995</i>	<i>Flood/Erosion</i>	598,808	229,216
<i>14</i>	1995	<i>Flood/Erosion</i>	855,585	807,344
<i>15</i>	1996	<i>Flood/Erosion</i>	404,456	605,312
<i>16</i>	1997	<i>Flood/Erosion</i>	167,586	384,666
<i>17</i>	<i>1998</i>	<i>Cyclone</i>	<i>1,423,320</i>	<i>1,808,401</i>
<i>18</i>	1970	<i>Cyclone</i>	-	3,350,000
<i>19</i>	1985	<i>Cyclone</i>	39,500	86,590
<i>20</i>	1986	<i>Cyclone</i>	17,800	84,837
<i>21</i>	1988	<i>Cyclone</i>	2,316,042	1,597,780
<i>22</i>	1989	<i>Cyclone</i>	38,712	38,629
<i>23</i>	1990	<i>Cyclone</i>	171,099	242,897
<i>24</i>	1991	<i>Cyclone</i>	11,760	8,725
<i>25</i>	1991	<i>Cyclone</i>	133,272	791,621
<i>26</i>	<i>1994</i>	<i>Cyclone</i>	<i>23,986</i>	<i>57,912</i>

<i>Sl. No.</i>	<i>Year</i>	<i>Disaster</i>	<i>Crops Damages (Acre)Fully</i>	<i>Crops Damages (Acre)Partially</i>
27	1995	<i>Cyclone</i>	2,593	42,644
28	1996	<i>Cyclone</i>	-	2,431
29	1997	<i>Cyclone</i>	254,755	59,788
30	1997	<i>Cyclone</i>	16,537	72,662
32	1999	<i>Flood/Erosion</i>	150,515	290,923
33	2000	<i>Flood/Erosion</i>	14,262	438,016
34	2002	<i>Flood/Erosion</i>	321,355	521.742
35	2003 (1st)	<i>Flood/Erosion</i>	275,491	496,406
36	2003 (2nd)	<i>Flood/Erosion</i>	97.885	8.577
37	2004	<i>Flood/Erosion</i>	,605,958	1,038,176
38	2007	<i>Landslide</i>	-	-
39	2007	<i>Flood/Erosion</i>	890,898	1,335,382
40	2007	<i>Cyclone (Sidr)</i>	743,322	1,730.32
41	2009	<i>Cyclone (Aila)</i>	77,486	245.968

*Source: Ref: a) Government of Bangladesh (2010) – List of past 41 Disasters in Bangladesh. Disaster Management Bureau. Ministry of Food and Disaster Management. Government of Bangladesh, Dhaka. [Accessed on 03 May, 2015]*

*b) Government of Bangladesh (2010) – Children and Disaster Risk Reduction. Background paper by Bangladesh. Ministry of Home and Children Affairs. Government of Bangladesh, Dhaka. [Accessed on 03 May, 2015]*

## CHAPTER - IV

### *Case Studies: Flood and Cyclone Case Studies challenging Disaster*

#### *Management in Bangladesh*

##### *Introduction*

The linkages between natural disaster, vulnerabilities and risks associated with disasters and disaster management has to be examined and explored with the help of case studies to better understand the disaster scenario in Bangladesh. Disaster risk reduction is the major focus of disaster management to be pursued so that sustainable development and human security concerns could better securitize the lives of the people. The case studies naturally help to understand the broad parameters of disaster risk management and preparedness in Bangladesh. Addressing specific case studies within the development perspective also brings out an understanding on the sustainable development agenda and human security linkage. The case studies (Case Study A: on Floods 2004 and Case Study B: on Cyclone Sidr 2007) in the process would examine the status of disaster management in the light of policy matrix and mechanism undertaken for disaster risk reduction in Bangladesh.

##### *Vulnerability to Flood Disaster*

Floods continue to be a major natural hazard in Bangladesh. Located in the lowest area of the Hindu Kush-Himalayan region, Bangladesh is considered as one of the highest flood prone countries in the world. Flood to some extent is an annual expected and well-come event for many

reasons for this country. But extreme floods inundates more than half of the country's landmass causing immense suffering to the human life, damages crops, properties, infrastructure and impacts the overall economic development of the country<sup>1</sup>.

The coastal areas of Bangladesh are highly populated. According to the population census of 2001, the total population of coastal areas is about 28 million which is about 22% of the total population of Bangladesh and with high incidence of poverty and low level of economic development, most of the people are forced to live in vulnerable conditions that increases the risk factor<sup>2</sup>.

The factors that make Bangladesh vulnerable to flood disaster are: (1) Geo-Physical Factors of Risk (2) Anthropogenic Factors of Risk. Both the factors are briefly explained below.

### ***(1) Geo-Physical Factors of Risk***

Floods are a recurrent feature in Bangladesh. The country occupies geophysical location of the deltaic flood plain of the Ganga-Brahmaputra-Meghna river basin system with experiencing highest rainfall due to the Himalayan range, large areas of low lying flat flood plain remains submerged for several weeks extending to months that causes immense damage. It is also vulnerable to coastal flooding due to the low lying and flat terrain<sup>3</sup>.

The source of the rivers that flow in the country lies in the Himalayas and melting snow during spring adds to the discharge in the rivers. Experiencing a monsoon climate, the wet season from June to September when low pressure and winds blowing from south west across Bay of Bengal brings heavy rain to the coastal regions of Bangladesh. Almost every year storm surges and

tropical cyclone submerge coastal areas. Added to these difficulties is the problem of climate change that has the potential to impact the country.<sup>4</sup>

## ***(2) Anthropogenic Factors of Risk***

Human interventions in the natural environment obstruct the flow of water over the land. Building of various structural measures for rapid economic development such as roads and railways and embankments to contain river water can increase the adverse impacts of floods. Rapid urbanization and deforestation in Bangladesh has also resulted in turning natural hazards into disasters. At present the capital city of Dhaka has a population of more than eleven million in 2010<sup>5</sup> which makes it highly vulnerable to disasters.

Rapid deforestation in Bangladesh has a negative impact on the rates of interception and evaporation resulting in more perspiration and discharge of water in the rivers. A major part of the population depends on subsistence agriculture to survive growing rice on rented plots of land or on char lands being very vulnerable land for carrying out agricultural activities.<sup>6</sup>

Management of floods is a costly affair and Bangladesh being a low developed country requires external assistance to execute flood management programmes. The loss to the economy from a severe cyclone both direct and indirect in nature may total over 2 percent of the gross domestic product (GDP).<sup>7</sup>

The following table shows the major flood damages in the last twenty –five years in Bangladesh [see Table no 4.1]



**Table 4.1: Flood Damages in the Last Twenty Five Years in Bangladesh (1984-2007)**

<i>Year of Flood</i>	<i>Inundated Area in square kilometer</i>	<i>Damages (total) In million US \$</i>	<i>Total no. of deaths</i>
<i>1984</i>	<i>50,000</i>	<i>380</i>	<i>NA</i>
<i>1987</i>	<i>50,000</i>	<i>1000</i>	<i>2050</i>
<i>1988</i>	<i>85,000</i>	<i>1200</i>	<i>2000-6500</i>
<i>1998</i>	<i>1,00,000</i>	<i>2800</i>	<i>1100</i>
<i>2004</i>	<i>55,000</i>	<i>2000</i>	<i>747</i>
<i>2007</i>	<i>32,000</i>	<i>1000</i>	<i>650</i>

**SOURCE:** Ref: Sixth Five Year Plan (2011-2015) Accelerating Growth and Reducing Poverty. Part 3- Statistical Annex and Technical Framework General Economics Division, Planning Commission, Ministry of Planning, Government of the People's Republic of Bangladesh. [Accessed on 29 September, 2015] pp 52

### ***Comparative Assessment of Major Floods in Bangladesh***

A comparison of the 2004 floods with the floods in 1988 and 1998 shows that the floods in 2004 have been less severe in terms of inundated area, duration, persons affected and loss of human lives. However, the 2004 floods have caused much greater damage to the economy in areas adjacent to the major rivers.

The flood damages do severely impact the development scenario that requires proper integration of disaster mitigation mechanisms into the development agenda. The comparative assessment of major floods in Bangladesh below shows the intensity of loss and damages incurred and its impact on the development scenario of the country<sup>8</sup>. (See Table 4.2)

**Table 4.2: Comparative assessment of major floods in Bangladesh (1984-2004)**

<i>Major floods</i>	<i>Ranking on % area of flood inundation</i>	<i>Impact of floods</i>
<i>1984</i>	<i>Rank 5</i>	<i>Inundated 52,520 sq-km, cost estimated at US\$378 million</i>
<i>1987</i>	<i>Rank 3</i>	<i>Inundated over 50,000 sq-km, estimated damage US\$ 1.0 billion, 2055 deaths</i>
<i>1988</i>	<i>Rank 2</i>	<i>Inundated 61% of country, estimated damage US\$ 1.2 billion, more than 45 million homeless, between 2,000-6,500 deaths</i>
<i>1998</i>	<i>Rank 1</i>	<i>Inundated nearly 100,000 sq-km, 1,100 deaths, rendered 30 million people homeless, damaged 500,000 homes, heavy loss to infrastructure, estimated damage US\$ 2.8 billion</i>
<i>2004</i>	<i>Rank 4</i>	<i>Inundation 38%, damage US\$ 6.6 billion,* deaths 747, affected people nearly 3.8 million</i>

*Source: Ref: Ministry of Environment and Forest “National Adaptation Programme of Action (NAPA) Report 2005” Government of the People’s Republic of Bangladesh [Accessed on 15 August, 2015 at 7.42 p.m.] p 6*  
*\*Other reports estimate the damage to about US \$ 2.2 billion*

### ***I. Case Study A: Floods 2004***

The case of Floods 2004 has been taken up for extensive study to understand the linkages between natural disaster and sustainable development impacting the security of the people in the light of various structural and non-structural measure taken to mitigate the flood disasters. Floods of 2004 have been considered as one of the worst floods in the last fifteen years that has impacted Bangladesh. Since the 1990’s, particularly after the devastating floods of 1988 and 1998 various initiatives for flood management were undertaken to mitigate flood disasters to

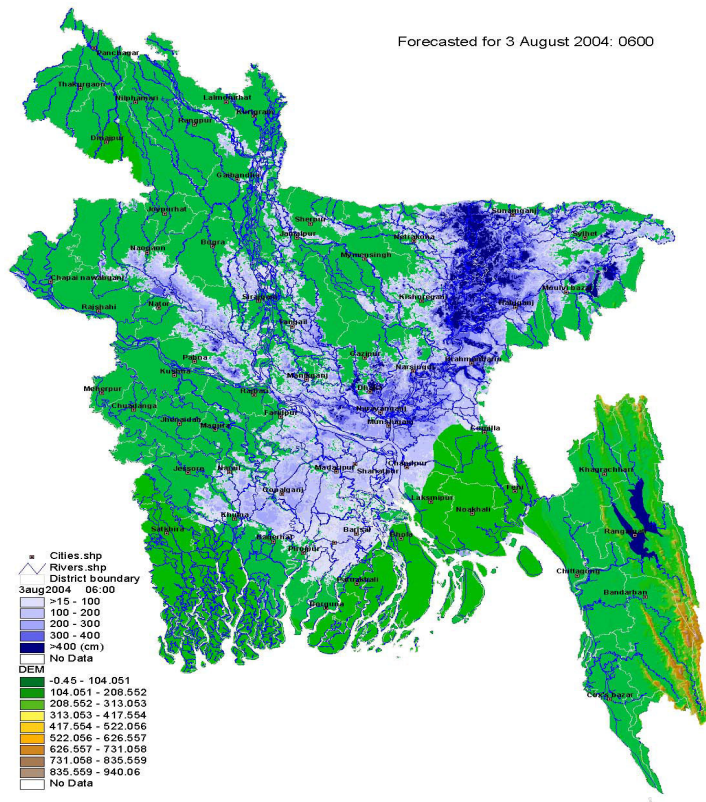
reduce the vulnerabilities of the people especially the poor and the marginalized including women and children. The state of Bangladesh has been moving towards a workable system of disaster management to mainstream disaster risk reduction strategies in development plans and policies. Contextually the case study of floods 2004 has been taken up to examine the various issues associated with disaster and its management in Bangladesh.

### ***Nature and Extent of Floods 2004***

The 2004 floods that lasted from July to September covered 50% of the country including both urban and rural areas were being exposed to the disaster. The rainfall totals of over 300mm in just 7 days caused extensive flooding across huge amounts of the country, notably in the North east and for the capital Dhaka. Rural areas also suffered, the rice crop was devastated as were important cash crops such as jute and sugar that badly impacted the economy<sup>9</sup>.

Bangladesh was once again subjected to most devastating floods experienced in the last fifty years. About thirty–eight percent (38%) of the country was inundated, seven hundred and forty seven (747) people lost their lives, two thousand five hundred kilometers (2500 km) of embankments were damaged, seventy–four (74) primary school buildings were washed away and the economic damage caused by the floods was estimated to be around US \$ two billion (2 billion). 36 millions or about 25% of the total population were affected particularly the poor and the vulnerable<sup>10</sup>.

**The following Map 4.1 The extent of coverage of the floods of 2004 in Bangladesh**



*Source: Ref: Ainun, Nishat (2004) “A Review of Flood Management in Bangladesh” IUCN, The World Conservation Union 2004 Available at [www.sitesource.worldbank.org](http://www.sitesource.worldbank.org) [Accessed on 17 July, 2015]*

***Impact of Flood 2004: Social, Economic and Environmental.***

The impacts of 2004 floods can be examined at three levels: social, economic and environmental level. At the societal level the impacts were devastating. According to the OCHA Country Situation Report on 22.07.2004 within days of the inundation millions were affected, houses damaged, schools destroyed, thousands of livestock and crops destroyed<sup>11</sup>. [see Table 4.3]

**Table 4.3: Impact of Flood 2004: Bangladesh**

<i>Personal Injury</i>	<i>Material Damage</i>	<i>Others</i>
<p><b>Affected Population: 19,022,600</b>  <b>Reported Deaths: 185</b></p>	<p><b>Houses Destroyed: 151,142</b>  <b>Houses damaged (Partially): 1,223,050</b>  <b>Road Network Destroyed: 5,000km</b>  <b>Road Network Damaged (Partially): 18,400 km</b>  <b>Schools Destroyed: 458</b>  <b>Schools Damaged (Partially): 7,582</b></p>	<p><b>Number of Livestock Death: 3,919</b>  <b>Crops Destroyed: 524,620 acres</b>  <b>Crops Damaged (Partially): 1,096,752 acres</b></p>

*Source: Asia Disaster Reduction Centre (ADRC) Report 2005: Bangladesh Flood Reporting on 2004/06/27. [Accessed on 03 August, 2015]*

By the mid September 2004 the reported death toll was 747 and 36 million people rendered homeless both in urban and rural areas<sup>12</sup>. About 40% Dhaka was under water and in places sewage system had failed sending contaminated water into the streets of Dhaka exposing millions to disease as people had no access to clean drinking water. The poor were the most affected particularly the slum dwellers as the slum housing were constructed in low lying areas which is one of the major negative impacts of economic globalization<sup>13</sup>.

More than one million children suffered from malnutrition and disease in the following months<sup>14</sup> and access to food was a major problem as hunger succeeds floods when crops are destroyed and food prices rises due reasons both natural and manmade which added to the woes of women and the household<sup>15</sup>. Schools have been closed or used as emergency shelters for homeless people. The damage to schools and hospitals was estimated at US \$7 billion<sup>16</sup>.

The economic impact to the floods 2004 was most severe causing extensive damage to the infrastructure- roads, bridges, railways, embankments and the irrigation system. Hectares of

aman rice seedlings and rice crops planted were washed away and hundreds of villages affected. This required emergency food aid until the next year's harvest. Similarly landless labourers and small framers having fragmented landholding were the most severely affected as crops, livestock were destroyed and fish farming affected which is one of the most important economic activities of Bangladesh<sup>17</sup>.

More than 2,000,000 acres of agricultural land have been submerged and countless crops ruined. The worst affected economic sector is the garment industry as the factories directly employ two million people and garments account for nearly 80% of all export earnings. Flood damages are costing the garments sector around US \$3 million a day<sup>18</sup>. Almost a million dwellings have been destroyed, more than 3,000,000 damaged and millions of inhabitants temporarily or permanently displaced<sup>19</sup>. The estimated economic damage assessed was US \$ 2 billion about 4% of the gross domestic product (GDP) in 2004<sup>20</sup>.

The environmental impacts can be accessed from the fact that almost 38% of the land was submerged due to floods destroying 800,000 hectares of agricultural crops land. Floods also caused breakdown of the embankments of areas close to river channels, soil erosion water logging, water contamination, lack of access to clean water, disruption of sanitation facilities, outbreak of water borne disease such as diarrhoea, cholera, typhoid and scabies spread causing serious health issues<sup>21</sup>. To infer from what Prof. Haroun. Er .Rashid says associated with this is the problem of rapid industrialization, urbanization, poor sanitation, sewage disposal, dumping of wastes, overfishing and deforestation for commercial purposes that have added to the already exposed country to natural disasters perriniously<sup>22</sup>. The following Table 4.4 provides a detailed

and clear picture of the flood impacts 2004 as on 3<sup>rd</sup> August 2004 affecting all the sectors and lives of the people of Bangladesh.

**Table 4.4: Bangladesh Flood of 2004: Assessment of the Flood Impact**

<i>Flood Impact</i>	<i>3<sup>rd</sup> August, 2004</i>
<i>Total Affected District</i>	<i>39</i>
<i>Number of Affected Upazila (Region)</i>	<i>261</i>
<i>Number of Affected Union</i>	<i>2,396</i>
<i>Area Affected km. Sq.</i>	<i>31,133</i>
<i>Affected Families</i>	<i>6,847,077</i>
<i>Affected Population</i>	<i>33,561,939</i>
<i>Reported Deaths</i>	<i>628</i>
<i>House Destroyed</i>	<i>858,202</i>
<i>House Damaged</i>	<i>3,159,235</i>
<i>Number of Livestock Death</i>	<i>20,674</i>
<i>Crops Destroyed acres</i>	<i>1,448,816</i>
<i>Crops Damaged (Partially) acres</i>	<i>1,102,000</i>
<i>Road Network Destroyed km.</i>	<i>13,541</i>
<i>Road Network Damaged km.</i>	<i>42,996</i>
<i>Bridges and Culverts Damaged</i>	<i>5,338</i>
<i>Embankment Damaged km.</i>	<i>3,014</i>
<i>School Destroyed</i>	<i>1,225</i>
<i>School Damaged (Partially)</i>	<i>23,439</i>
<i>Total Number of Shelters Opened</i>	<i>5,021</i>
<i>Number of People in Shelters</i>	<i>1,683,839</i>

*Source: Ref: Geo-Online Report (2004) Flooding In Bangladesh 2004: The Effects of the Bangladesh Floods July/August 2004 [Accessed on 03 August, 2015]*

It is to be noted that the Disaster and Emergency Response (DER) Report 2004 presented a comprehensive Post-Flood Needs Assessment Summary Report on the Monsoon Floods of 2004

with assessments and recommendations for recovery from flood damages<sup>23</sup>. The report was prepared by the Disaster Emergency Response Local Consultative Group. A Sub-Group consisting of the Disaster and Emergency Response Division of the Disaster Management Bureau, working under the Ministry of Food And Disaster Management, Government of Bangladesh, and the Bangladesh Local Consultative Group. The DER works as a key national platform for coordinating the activities of United Nations and its various agencies, the donor partners, and the various non-governmental agencies working for efficient emergency response and preparedness measures such as floods forecasting and warning mechanisms in the event of disasters<sup>24</sup>.

The Disaster and Emergency Response (DER) Post Floods Needs Assessment Report 2004 corroborated the facts that the floods of 2004 have further impacted the health, nutrition, water and sanitation sectors. The immediate response of the government was to provide relief operations with policy initiative for food security providing 10 kg of rice per family per month which was considered meager as per the Report as this amounts to only 40 gm per person per day. The main reason for this drawback was resource constraints that prevented even the Agricultural Rehabilitation Programme from meeting more than a small proportion of the full needs with a comprehensive package<sup>25</sup>.

The Report (2004) expressed great concern that the floods might push a large number of the poorest families deeper into poverty which required targeted assistance including food relief, support to agriculture employment opportunities, micro-credit and financial assistance to rebuild their homes, employment generation through Food (supplementary feeding of vulnerable group programme) and Cash For Work or support to cottage industries to recover from the floods.



Various stakeholders, international and national NGOs were involved in food relief distribution. The early £5 million contribution of UK-DFID came through the World Food Programme<sup>26</sup>.

### ***Disaster Management and Mitigation Strategies in Bangladesh: Floods***

In the context of flood disaster the policy initiatives, strategies and mechanisms needs be analyzed to bring out a clear understanding of flood management policies adopted by Bangladesh. Floods continue to be major hazards in Bangladesh and management of floods has been the major pre-occupation of the state and the people. To mitigate the impacts of floods various measures have been implemented to better equip the country to deal with flood disaster. During the last forty five years, the country has adopted sectoral measures and evolved continuously, flood management strategies, mechanisms and policies both structural and non-structural in nature to mitigate the vulnerabilities associated with floods generating mixed experiences.

The initial response of the government was to adopt various structural measures by emphasizing the implementation of large scale flood control, drainage and irrigation projects which comprised of flood control programmes, flood embankments, levees, tidal sluice gates on rivers, drainage channel improvements, drainage structures, dams and barrages, pumping systems for irrigation purposes. Non-structural measures such as national disaster management policy, flood forecasting and warning, cyclone warning, flood proofing, flood zoning, flood shelters, emergency preparedness and flood insurance though still very weak in Bangladesh were later incorporated as structural measures alone could not mitigate flood problems<sup>27</sup>.

The strategies, policies and mechanisms adopted for flood management in the context of Bangladesh can be categorized into three phases.

A) The First Phase- Pre Independent Phase- Followed Till 1970s-1980s

B) The Second Phase- Post Independent Phase 1980s-1990s

C) The Third Phase- Current Phase 2000 onwards [the phase of disaster management]

The **first phase** or pre-independent phase was generally guided and coordinated by the policies already formulated by the Government of Pakistan (East Pakistan). To mitigate flood related issues a Flood Commission was set up in 1955 to examine flood control measures. The United Nations Commission (Krug Commission) prepared the first and the most important document on water development of Bangladesh in 1956. In 1958 the East Pakistan Water and Power Development Authority (EPWAPDA) was allocated water development related functions that was later transferred to the Bangladesh Water Development Board (BWDB) after independence in 1971<sup>28</sup>. The EPWAPDA formulated a Master Plan in 1964 with assistance of international donor partners which was again reviewed by the World Bank in 1966 for flood control measures, drainage and irrigation projects including building embankments along big and mighty rivers flowing into Bangladesh became the initial strategy that was followed till the 1970s-1980s by the successive governments. Till 1988 7,500 km of embankments had been built along the Ganga Brahmaputra Meghna and Teesta River that consumed 10% of the annual development plans of the government<sup>29</sup>.

Successive floods followed annually and the flood control measures were not successful in containing the flood and human insecurities. The catastrophic floods of 1987, 1988 again

renewed the government and donor partner's commitment to flood protection that culminated into Flood Action Plan in 1990.

The *second phase* in the 1990s was dominated by the Flood Action Plan<sup>30</sup> (**FAP**) formulated by the Bangladesh Water Development Board (BWDB) Government of Bangladesh and donor partners (including-UNDP, USAID, ADB, UK, EC, Japan, France and World Bank) with World Bank acting as the coordinator for the formulation and implementation of the plan to redress the chronic problem of floods in Bangladesh. The FAP had 26 original components and activities including 11 main components and 15 supporting activities that together comprised the plan. In addition the Ministry of Water Resources incorporated '11 Guiding Principles' into the FAP which the Ershad regime drew up after long negotiation in 1988 and subsequently endorsed as the government policy<sup>31</sup>.

The Ministry of Water Resources further insisted that flood control was an international responsibility since 90 % of the river flow in the country is received by international rivers. With the sharing of the Ganges water and the Farakka barrage dispute coming under the preview of Indo-Bangladesh Treaty of Cooperation and Friendship 1972 subsequently inter-territorial matters had to be dealt on a bilateral basis. More internal measures were sought after to deal with the chronic flood problem<sup>32</sup>.

The FAP generated a lot of negative concerns from the political, social, environmental and public platforms due to the consequences generated by large scale structural projects. The FAP was further critiqued as an unrealistic and expensive scheme that agencies like World Bank have pushed on third world countries without a realistic appraisal of the ground reality in the country

concerned and in this case Bangladesh. This also led to a lot of civil society activism to withdraw the FAP programme<sup>33</sup>.

Another drawback highlighted the limitation of the project for not taking into account the environmental concerns and human made ecological disasters that led to a more comprehensive outlook on the development of the country's water resources from an integrated perspective on floods<sup>34</sup>. The FAP came to an end in 1995 highlighting the fact that both structural and non structural measures were required to develop a more holistic approach towards flood management<sup>35</sup>.

The *current phase*, the phase of disaster management reflects the change in perception regarding water management and flood control emphasizing on both, structural and non- structural methods of flood management with specific importance given to public participation and role of strongly emphasizing a change in policy from the earlier traditional bias toward structural mitigation of floods towards a more integrated approach even including threats arising from climate related disasters<sup>36</sup>. The Standing Orders on Disasters (2010), The National Plan for Disaster Management (2010-2015) and The National Disaster Management Act of 2012 guides the disaster management system in Bangladesh

To pursue the objective of integrated water resource management the policy response had already began in the 1990s. Water Resources Planning Organization (WARPO) was created by Water Resources Planning Act, 1992 under the Ministry of Water Resources Bangladesh for macro-level water resources planning and management in Bangladesh. It is the central

coordinating body for the water sector and acts as an Executive Secretariat of the Executive Committee of the National Water Resources Council (ECNWRC)<sup>37</sup>.

In 1995, Bangladesh Water and Flood Management Strategy (BWFMS) was approved that proposed a range of structural and non-structural measures to deal with flooding. It also reflected the change in approach towards water sector management by taking into consideration the strategy to promote water resource planning with more attention to fisheries and environmental considerations. The strategy was updated in 1997-1998 taking into consideration the Ganges Water Treaty of 1996. The strategy also identified the need for a National Water Policy and a National Water Management Plan<sup>38</sup>.

The National Water Policy (NWPo) was prepared by WARPO approved in 1999 was based on the principles of integrated water resource management which also emphasized the issue of participatory role of the people and other stakeholders to preserve and protect the environment and water resources. The principle of integrated water resource management required the protection, restoration, and preservation of the environment and its biodiversity including wetlands, mangrove and other national forests, endangered species and the water quality<sup>39</sup>.

A series of policy initiatives were taken by the government starting with the National Environment Policy 1992, National Forestry Policy 1994, National Energy Policy 1996, National Fisheries Policy 1998, National Agricultural Policy 1999 And National Industrial Policy 1999. Each of these policy statements were prepared by the relevant ministries to bring multi – sectoral approach to water management<sup>40</sup>.

The National Water Management Plan was formulated in 2001 and approved in 2004 in order to implement The National Water Policy in the long run that will manage water resources of the country in the next 25 years with the provision to review the implementation of 84 activity programme and update every five year. In the short run the programme recommended for building institutional capacity through flood control and drainage projects (FCD) as well as flood control and drainage with irrigation facilities project (FCD/I)<sup>41</sup>.

The Bangladesh Water Development Board (till 2006) has completed a total of 684 small, medium and large scale water sector development projects, of which a total of 473 small, medium and large-scale projects include FCD and FCD/I projects. These projects provided flood control and drainage facility to a 5.89 million hectare of land .As a part of this, a total of 9,943 km of embankment, 13,949 floods control/regulating structures 5,111 kms of drainage canals have been constructed<sup>42</sup>. But all these structural measures have failed to address the disaster scenario in Bangladesh impacting development and human security concerns.

#### ***Disaster Management and Flood 2004***

The above discussion points to the fact that structural measures are not adequate to mitigate the disastrous impact of flood disaster. It also requires the non-structural measures particularly the various legal and institutional mechanisms and preparedness measures such as flood forecasting and warning to be incorporated and implemented for proper response. Pointing towards the drawbacks on flood and flood management strategies Nandan Mukherjee stated that the National Water Management Plan 2004 proposes for a periodic review of the implementation of the 84 activity program, but till to date no such review has been made and it has been suffering from the

same sluggishness as the outcome from FAP and several other studies faced during implementation<sup>43</sup>. In a similar vein another research finding is very skeptical of the several highly expensive, huge projects promoted and funded by various aid agencies to control river water as they have not been able to save Bangladesh from disastrous floods, whose frequency has increased over these years. The flood of 2004 is a case to the point<sup>44</sup>.

The Disaster and Emergency Response (DER) Report (2004) recommended that the country needs to improve disaster response and preparedness at local levels, capacity building must be engaged into the district level administration with provision of immediate rescue resources, emergency funding mechanisms, with better information management and contingency planning. In the long run more emphasis is required on mitigating and managing future flood disasters to reduce the increasing vulnerability of the people through proper development programmes<sup>45</sup>.

Against the above backdrop it could be stated that the policy on management of disaster was always sectoral in nature revolving around the “culture of relief” instead of “culture of preparedness” and each disaster type was addressed on a sectoral basis. The same happens in case of flood disasters. A decade has passed following the devastating flood of 2004 and flood has become an annual affair in Bangladesh. The recent occurrences of floods and their management have once again shown that disaster mitigation and preparedness has a long way to go in case of Bangladesh. The structural and non- structural measures must be integrated to get better results as Bangladesh needs to move from relief and response towards proper disaster management<sup>46</sup>.

Alternative perspectives of disaster management must be incorporated to complement the dominant approach on disaster management. Living with floods is a way of life in the GBM Basin. As most of the modern flood control technologies have their own limitations and less people-friendly the focus should be the use of flood waters in the best possible way that ensures the least damage. People's participation for management of disasters is highly desirable activity. The traditional forms of water management should also be practiced that had been the case in many villages in Bihar, West Bengal and Bangladesh since time immemorial which ensures peoples participation for management of floods<sup>47</sup>.

Community participation at every stage of policy making has to be ensured as this could result in constructive approach for addressing complex situations both at the local and national levels of disaster management in Bangladesh. Community participation ensures the strengthening of the core capabilities to address disaster risk reduction strategies and development scenario so that threats like natural disaster could be mitigated at all levels of governance<sup>48</sup>.

### ***Vulnerability to cyclone disaster***

Bangladesh is one of the most cyclone hazard prone countries in the world. Cyclones frequent the country almost every year turning into a disastrous event due to a number of risk factors. Out of all types of disasters, tropical cyclone causes huge damage to the coastal infrastructure, wealth and social livelihood. Historically major cyclones that have hit the coastal areas of the country caused immense suffering to the human life, damaged crops, properties, infrastructure and livelihood and affect the overall economic development scenario of the country. From the period



of 1795 – 2010 Bangladesh has been exposed to 53 incidence of cyclones some very extreme in nature<sup>49</sup>. The following table shows the severe damages caused due to cyclones in the last forty years in Bangladesh [see table no 4.5]

**Table 4.5: Cyclone Damages in the Last 40 Years in Bangladesh**

<i>Year and date of cyclone</i>	<i>Maximum speed in km/hr</i>	<i>Storm surge height in metres</i>	<i>Number of people killed</i>
<i>12<sup>th</sup> November 1970 (BHOLA)</i>	<i>224</i>	<i>6.0-10.0</i>	<i>300,000</i>
<i>25<sup>th</sup> May 1985</i>	<i>154</i>	<i>3.4-4.6</i>	<i>11,069</i>
<i>29<sup>th</sup> April 1991 (GORKY)</i>	<i>225</i>	<i>6.0-7.6</i>	<i>138,882</i>
<i>19<sup>th</sup> May 1997</i>	<i>232</i>	<i>3.1-4.6</i>	<i>155</i>
<i>15<sup>th</sup> November 2007 (SIDR)</i>	<i>223</i>	<i>Upto 10.0</i>	<i>3363</i>
<i>25<sup>th</sup> May 2009 (AILA)</i>	<i>92</i>	<i>N.A</i>	<i>190</i>

*Source: Ref: Bangladesh Meteorological Department 2007, National Plan for Disaster Management (2010-2015) Disaster Management Bureau, Disaster Management & Relief Division April 2010. Government of the People's Republic of Bangladesh [Accessed on 16 May, 2015] pp 8*

The factors that make Bangladesh vulnerable to tropical cyclones are: (1) Geo-Physical Factors of Risk and (2) Anthropogenic Factors of Risk. Both the factors are briefly explained below.

### ***(1) Geo-Physical Factors of Risk***

The coastal region of Bangladesh is highly vulnerable to cyclones accompanied with storm surges due to its geophysical location in Indian Ocean which is inherently vulnerable to tropical cyclones. The region of South Asia with a vast coastline of 12,000 kilometres has extremely high population density along the coast. It has been observed globally that in the past three centuries 20 out of 23 major cyclone disasters have occurred over the Indian subcontinent (India –

Bangladesh)<sup>50</sup>. The reason for vulnerability of the Indian subcontinent lies in its geophysical location which is a hotspot for tropical cyclone with warm sea temperature, high relative humidity causing formation of massive clouds, creation of cyclonic pressure in Bay of Bengal that is likely to lead to more intense tropical cyclones accompanied with high intensity storm surges which is the catastrophic phenomena of cyclones<sup>51</sup>.

In Bangladesh cyclone and tidal surge are considered as the most catastrophic phenomena of coastal regions. Bangladesh experiences extreme cyclones that generally occur in two seasons post monsoon from late September to middle of November or early December and pre monsoon that could happen in April to early June which often causes heavy rainfall and cyclonic flooding<sup>52</sup>. Cyclonic flood is much more disastrous than normal flooding as it submerges the agricultural land and destruction of homesteads causing devastating damages to crops, high death tolls and loss of livestock<sup>53</sup>.

Situated in northern Bay of Bengal the coastal area of Bangladesh presents a unique combination of high tides, a funnel shaped coastal landscape, the low flat coastal terrain and a high population density have produced some of the highest mortality figures associated with storm surges. All the factors for a major cyclone disaster are present in Bangladesh and such disasters have occurred several times in the past and claimed hundreds of thousands of lives notably in 1970 and 1991<sup>54</sup>.

## ***(2) Anthropogenic Factors of Risk***

Bangladesh is a densely populated low lying vast river deltaic nation. Cyclones accompanied with storm surges and heavy rainfall devastates the low lying lands every year often killing

hundreds of thousands of people. The country is one of the worst sufferers of all cyclonic casualties in the world with average death toll can be 10,000 person per cyclone in case of major cyclones in a year<sup>55</sup> People occupying the low lying deltaic islands and coastal plains are most likely to be impacted by cyclones and storm surges destroying villages, livelihoods and resulting in high death tolls.

The population pressures and high level of poverty within the country results in the poorer sections of society to live on the chars lands, particularly on active river floodplains, young estuarine floodplains and coastal parts of tidal floodplains that has broader implications for the demographic structure and economy. It is estimated that about 4 million people on Meghna estuarine chars and other coastal areas are exposed to cyclones and storm surges<sup>56</sup>. The risk is higher when millions continue to live on low lying coastal lands due to socio economic vulnerabilities. Land degradation due to overexploitation of inland wetlands has affected crop production and over exploitation of waterways has impacted the economic activity of 10 million fishermen dependent on this vital resource<sup>57</sup>.

### ***Comparative Assessment of Major Cyclone Occurrences in Bangladesh***

A comparative assessment of major cyclones in Bangladesh below shows the intensity of loss and damages incurred and its impact on the development scenario of the country. (See table 4.6)

A comparison of cyclone Sidr 2007 with the cyclone occurring in 1970 and 1991 shows that the cyclone 2007 have been more severe in terms of number of districts affected, where as persons affected and loss of human lives was greater in 1991 compared to 2007. Sidr may be considered as the strongest cyclone to hit the country since the 1991 cyclone that killed over 143,000 people

of Bangladesh. Although, the death from Sidr is less compared to 1991 cyclone but damage to homes, crops and livelihoods could be extensive. The high number of casualties is due to the fact that cyclones are always accompanied with storm surges. Lack of adequate shelters and preparedness facilities increases the casualties during the cyclone events. However the 2007 cyclone have caused much greater damage to the economy in areas adjacent to the coast hampering infrastructure and livelihood of the people dependent on fishing industry<sup>58</sup>. (See Table 4.6)

**Table 4.6: Comparative Assessment of Major Cyclones and their Impacts: Bangladesh**

<i>Events Associated With Cyclone</i>	<i>Cyclone Year 1970</i>	<i>Cyclone Year 1991</i>	<i>Cyclone Year 2007</i>
<i>Storm surge (metres)</i>	<i>6-9 meters</i>	<i>6-7.5 meters</i>	<i>Upto 10 meters</i>
<i>Maximum wind limit (km/hr)</i>	<i>223km/hr</i>	<i>225km/hr</i>	<i>Upto 240km/hr</i>
<i>Affected district</i>	<i>5</i>	<i>9</i>	<i>30</i>
<i>Affected people</i>	<i>1,100,000</i>	<i>13,798,275</i>	<i>6,851,147</i>
<i>Number of dead people</i>	<i>470,000</i>	<i>138,882</i>	<i>3,292*</i>

*SOURCE: Ref: Government of Bangladesh (2009) Ministry of Food And Disaster Management and Comprehensive Disaster Management Programme (April 2009): "Report On The Cyclone Shelter Information For Management of Tsunami and Cyclone Preparedness:Annex C" [Accessed on 15 May, 2015] pp 2-3*

## **II) Case Study B: Cyclone Sidr 2007**

The case of cyclone SIDR 2007 has been taken up for study since it is considered as one of the worst cyclones after the devastating cyclone of 1991 in the last fifteen years that has impacted Bangladesh extensively to understand the linkages between natural disasters and sustainable development impacting the security of the people in the light of various structural and non-structural measure taken to mitigate the cyclone disasters.

Since the 1990's, particularly after the devastating cyclone of 1991 various initiatives for management of cyclones have been undertaken to mitigate cyclone disasters so as to reduce the

vulnerabilities of the people especially the poor and the marginalized including women and children. The state of Bangladesh has been moving towards a workable system of disaster management to mainstream disaster risk strategies in development plans and policies. Contextually the case study of cyclone Sidr 2007 has been taken up to examine the various issues associated with this disaster.

### ***Nature and Extent of Cyclone Sidr 2007***

On 15<sup>th</sup> November 2007, Cyclone Sidr, a category 4 cyclone<sup>59</sup> described as an extremely severe cyclone resulted in one of the worst natural disasters in Bangladesh. It was also described as one of the biggest storms ever in South Asia<sup>60</sup> that erupted from the Bay of Bengal with wind speed of 240 kilometers per hour, swept through the southwestern coastal areas within 155-miles radius of its eye with heavy rain and storm surges reached up to 15-20 feet high in some places on 15th November 2007 causing heavy damages, loss of life and property<sup>61</sup>.

It caused extensive damages to houses, water and sanitation infrastructures, harvests, food stocks and livelihoods, also killing livestock and destroying fishing material and other income generating assets. Cyclone Sidr and two preceding floods resulted in at least 4,400 deaths disrupting the lives of millions of people in some of the poorest and most vulnerable areas of the country.

According to Bangladesh Metrological Department, Government of Bangladesh cyclone SIDR crossed the Khulna-Barisal coast near the Sunderbans mangrove forests and then it crossed over the Baleshwar River in Barguna district at midnight. The coastal districts of Barisal Patuakhali, Borguna, Pirojpur, Jhalkathi, Bhola, Bagerhat, Khulna, Satkhira, Shariatpur, Chittagong and

Cox's Bazar and their offshore islands and chars received the major destructions by cyclone Sidr. Out of 12 severely affected districts, four are the worst affected, these are Bagerhat, Barguna, Pirojpur and Patuakhali. Approximately 563,877 houses were totally destroyed and 9,55,065 houses were partly damaged. It was also reported that 186,883 hectares of crop areas were fully and 498,645-hectare area partly damaged by SIDR. The death toll according to government report was estimated to 3,363 peoples were dead and 55,282 were injured<sup>62</sup>. (See Map No. 4.2)

**Map No. 4.2: Map of Super Cyclone Sidr: 15 November 2007**

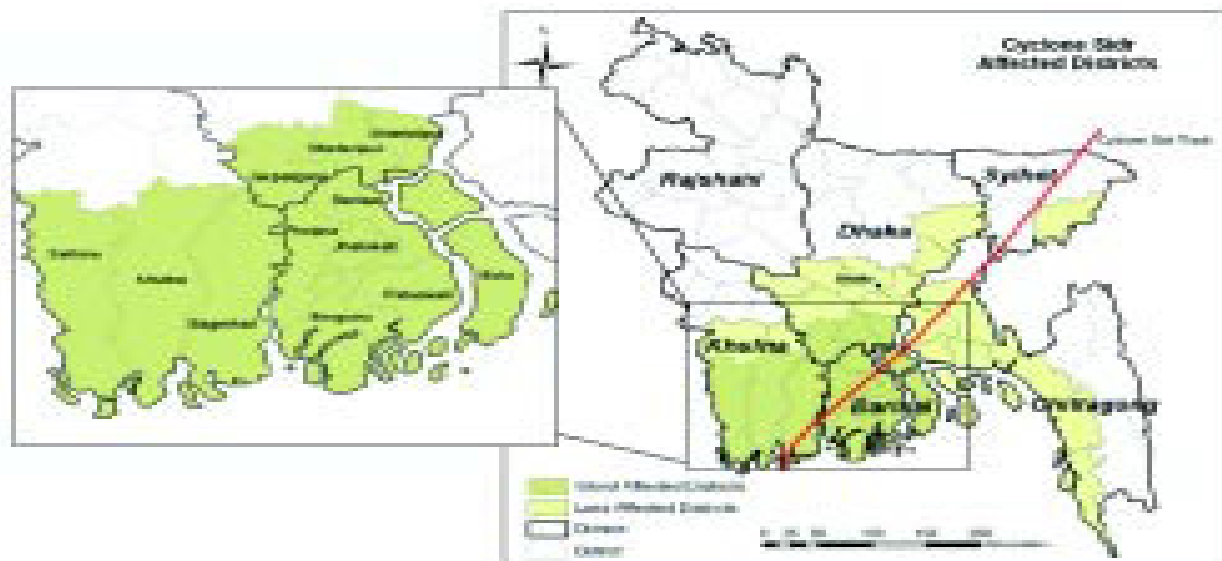


**Source: Ref: Bangladesh Meteorological Department 2007, In National Plan for Disaster Management (2010-2015) Disaster Management Bureau. Disaster Management & Relief Division Government People's Republic of Bangladesh April; 2010 [Accessed on 16 May, 2015]**

The affected area covered the entire coastal belt where an estimated 5.5 million people were affected in the 30 out of 64 districts of Bangladesh with an economic loss of US \$ 1,675 million,

1.4 acres of cropland wiped out and 352,000 livestock drowned<sup>63</sup>. According to the South Asia Disasters Report 2007, Cyclone SIDR that impacted the coastal belt of Bangladesh with high density population that resulted in an estimated death of 4,234 people, 8.9 million affected, and damage to the extent of US\$ 2.3 billion<sup>64</sup> (See Map No. 4.3).

**Map No. 4.3: Cyclone Sidr Affected Districts of Bangladesh**



**Source: Ref: Cyclone SIDR in Bangladesh: Damage, Loss and Need Assessment for Disaster Recovery and Reconstruction after Cyclone Sidr Report of Government of Bangladesh, 2008. [Accessed on 23 August, 2015]**

### ***Impact of Cyclone Sidr 2007: Social, Economic and Environmental***

The impact of cyclone Sidr 2007 floods can be examined at three levels: social, economic and environmental level. At the societal level the impacts were devastating. The damage in Bangladesh was extensive, including houses, low thatched mud houses and educational institutions blown away and enormous damage to trees in coastal areas. Some local officials have described the damage as being even worse than that from the 1991 cyclone. The twelve worst

affected districts were Barguna, Bagerhat, Barisal, Bhola, Gopalgong, Jhalkati, Khulna Madaripur, Patuakhali, Pirojpur, Satkhira, and Sariatpur. Out of the 15 affected districts 8 had been earlier affected by floods occurred earlier this year resulting internal displacement of thousands of people<sup>65</sup>. The number of 2.3 million households were affected to some degree by the effects of cyclone Sidr and about one million houses were seriously damaged<sup>66</sup>.

The cyclone that hit the coastal areas of Bangladesh had a severe impact on the coastal economic activities. About a large number of fishermen were drowned and also went missing due to the devastating storm surge. At least 500 trawlers with over 3000 fishermen have been missing since cyclone Sidr<sup>67</sup>. Due to the cyclone a massive health hazard was visible over the areas hit by Sidr. Acute shortage of drinking water due to contamination was the result of debris and salinity of water increased due to inundation from storm surges and sanitation infrastructure destroyed<sup>68</sup>. According to the World Health Organization people in the cyclone affected areas experienced severe health problems and with spread of water borne diseases (such as diarrhoea, pneumonia, typhoid fever and jaundice) due to shortage of water and other health related difficulties with women and children being the worst sufferers<sup>69</sup>

The economic impact of the cyclone Sidr was very severe considering the amount of destruction it caused to the socio- economy sector as a whole. The Government of Bangladesh estimates the loss due to cyclone SIDR in comprehensive terms. The cyclone hit at a time when *aman* rice, the predominant source of food (security) in the area, was about to be harvested and almost 113,000 hectares and 1,400,000 hectares of crops were totally and partially damaged, respectively<sup>70</sup>.



The crop loss was estimated to be about 1.3 million tons. About 1.5 million houses were damaged and more than 4 million trees were uprooted or destroyed. The livestock death toll was over 100,000. About 4231 educational institutions destroyed and another 12,723 partially damaged. The cyclone caused a total breakdown of communication lines both electricity and telecommunication affecting also the city of Dhaka with more than 87,000 km of roads washed out and 1687 bridges damaged and about 1875 km of dams impacted<sup>71</sup>.

According to the Government Report 2008: Cyclone Sidr in Bangladesh -Damage, Loss, and Needs Assessment for Disaster Recovery and Reconstruction Report (March 2008)<sup>72</sup> was prepared in collaboration with donor partners to estimate the damages to assets, change in economic flows and impacts on social and economic conditions<sup>73</sup>. A comprehensive analysis undertaken by a team of expert members comprising of the Government of Bangladesh (GoB) and international donor partners estimated that the total damage and losses caused by the cyclone to be Bangladesh Taka (BDT) 115.6 billion / (US\$1.7 billion). More than two-thirds of this was physical damage and one third economic losses<sup>74</sup>.

The most affected sectors were housing, agriculture, transport, water control structures, education, and industry. Damage and losses were concentrated in the housing sector loss of US\$840 million /50 percent of the total loss, productive sectors loss of US\$ 490 million/ 30 percent of the total loss, and public sector infrastructure loss of US\$250 million/16 percent of the total loss. Damage and losses to private assets and livelihoods was more compared to the losses and damage to public infrastructure<sup>75</sup>.

Out of the 30 affected districts the effects of the disaster were highly concentrated in the Districts of Bagherat, Barguna, Patuakhali, Pirojpur, and Barisal. These districts have a high percentage of poverty ranging between 35% to 50% in comparison to the rest of the population.<sup>72</sup> The disaster had a disproportionate impact on some of the poorest sections of the population in the country that required extra effort on part of the government to address the situation in budget allocations<sup>76</sup>.

The environmental impacts can be assessed from the fact that almost the entire affected area covered the coastal belt where an estimated 5.5 million people were affected in the 30 out of 64 districts of Bangladesh. Agricultural land was submerged due to coastal flooding impacting agricultural production in the current financial year with 1.4 acres of cropland affected, breaching of coastal embankments, damaging bridges and dams on the path of cyclone, tidal water in coastal areas resulted in increase in soil salinity, water contamination, lack of access to clean water, disruption of sanitation facilities, outbreak of water borne disease<sup>77</sup>.

The Sunderbans, identified as world heritage site referred also as the “Mangrove Forests” is the world’s largest single tract mangrove forest spreading across the coastal areas of Bangladesh that acts as the natural embankments for the coastal border areas against storm surges arising with cyclones.(State of Environment Report 2001).The Sunderbans was badly hit by cyclone SIDR and many trees were uprooted along the coastal belt<sup>78</sup>.

According to a case study research cyclone Sidr caused extensive damage to trees, mostly uprooted and fell and significant losses were observed<sup>79</sup>. It is estimated that a quarter of the world heritage site Sunderbans was damaged and experts are of the view that it might take at

least 40 years to recover from this catastrophic situation<sup>80</sup>. The estimated loss to the forests due to cyclone SIDR according to government data is about US\$ 5.6 million. The large scale destruction of the mangrove forests is a major environmental and ecological damage to the region of South Asia<sup>81</sup>.

The following Table 4.7 provides a detailed account of cyclone Sidr 2007 impacts affecting all the sectors and lives of the people of Bangladesh.

**Table 4.7: Cyclone Sidr 2007: Impact Assessment of Damages and Loss in Bangladesh**

<i>Affected Districts</i>	<i>30</i>
<i>Most Affected Districts</i>	<i>12</i>
<i>Affected Upazillas</i>	<i>200</i>
<i>Affected Union/Municipality</i>	<i>1950</i>
<i>Death Toll</i>	<i>3363</i>
<i>Injured Persons</i>	<i>55282</i>
<i>Missing Persons</i>	<i>871</i>
<i>Affected Families</i>	<i>2064026</i>
<i>Affected People</i>	<i>8923259</i>
<i>Fully Damaged Houses</i>	<i>563877</i>
<i>Partially Damaged Houses</i>	<i>955065</i>
<i>Fully Damaged Crop Fields</i>	<i>186,883 ha</i>
<i>Partially Damaged Crop Fields</i>	<i>498,645 ha</i>
<i>Dead Cattle &amp; Poultry</i>	<i>1778507</i>
<i>Fully Damaged Educational Institutions</i>	<i>4231</i>
<i>Partially Damaged Educational Institutions</i>	<i>12723</i>
<i>Fully Damaged Roads</i>	<i>1714 km</i>
<i>Partially Damaged Roads</i>	<i>6361 km</i>
<i>Damaged Bridge/Culvert</i>	<i>1687</i>
<i>Affected Dams</i>	<i>1875</i>
<i>Damaged Trees</i>	<i>4065316</i>
<i>Ferries</i>	<i>28 (out of 44) (13 restored)</i>
<i>Electricity</i>	<i>33kv line- 416 km, 11 kv line 287 km</i>
<i>Affected Tubed Wells</i>	<i>901 in 3 districts</i>
<i>Affected PSF (pond sand filter). 419 nos</i>	
<i>Affected SST (shallow shouted tubewell)/VST (very shouted tubewell)</i>	<i>55</i>
<i>Forest</i>	<i>US \$ 5.6 million</i>
<i>Death of wildlife (deer)</i>	<i>24 nos</i>
<i>Roads &amp; Highway</i>	<i>US \$ 2.6 million</i>
<i>BWDB (embankments, sluice gates, riverbank protection structure)</i>	<i>US \$ 27.0 MILLION</i>

Source : Ref: National Plan for Disaster Management (2010-2015) Disaster Management Bureau Disaster Management & Relief Division April 2010 Government of the People's Republic of Bangladesh [Accessed on 16 May 2015] pp 9-10

### ***Disaster Management and Mitigation Strategies in Bangladesh: Cyclones***

In the context of Cyclone Sidr 2007, the policy initiatives and preparedness mechanisms would be addressed to bring out a clear understanding of cyclone preparedness policies and mechanisms adopted by Bangladesh. Tropical cyclone continues to be a major hazard for the country and time and again has devastated the lives and economy of the people of Bangladesh. To mitigate the impacts of cyclones, the government policy has been to develop and implement various measures to better equip the country to deal with the destructions caused by cyclones. Since independence the State of Bangladesh has adopted and evolved continuously cyclone management strategies and preparedness mechanisms both structural and non-structural to mitigate the vulnerabilities associated with cyclone disasters generating mixed response at the societal level<sup>82</sup>.

The initial policy response of the government has been to adopt various structural measures by emphasizing on the building of cyclone shelters, cluster shelters, coastal embankments to reduce the vulnerability of the coastal areas by planting of mangrove forest on land between the embankment and the shore line though not received positively by the local population due to their fears of being left outside the embankment areas for cropping purposes and also local dependent on sea fishing<sup>83</sup>.

The non-structural measures include the National Policy on Disaster Management (2010), Standing Order on Disasters (revised 2010), Cyclone Warning, Coastal Zoning Mapping and Plan – Policy, Land Resource Management and Planning for Coastal Areas, Emergency Preparedness and Cyclone Relief and Response Strengthened. The non-structural measures were

incorporated to strengthen the disaster risk reduction strategies alongwith structural measures as previous cyclone events have showed that structural measures, weak governance and lack of accountability alone could not mitigate the negative impact of cyclone events.

The policies and mechanisms adopted for cyclone management and preparedness in the context of Bangladesh can be categorized into three phases:

- A) The First Phase – the pre-independent phase till 1970s
- B) The Second Phase – From 1970 till 1990s
- C) The Current Phase – From 2000 till present

The initial phase was generally guided and coordinated by the policies already formulate by erstwhile government of Pakistan. The major cyclone preparedness mitigation was the construction of cyclone shelters. During the 1960's, the structural response to cyclone disasters resulted in the construction of a number of small earthen mounds (Killas) in the coastal areas to provide temporary refuse to the people and their livestock. After the cyclone of 1970 the government policy proposed to build 2500 concrete shelters out of which only 299 were built<sup>84</sup>.

The second stage began in the shadow of the devastating cyclone of 1970 (Dhaka). The cyclone of 1970 had set the agenda for the newly independent State of Bangladesh to administer policies for the protection of lives of the people and their livelihood as well as to protect Bangladesh from future damages occurring due to natural calamities.

The government of Bangladesh initiated a Cyclone Preparedness Programme in 1972 with the objective of developing effective cyclone preparedness measures for coastal areas to minimize

loss of lives and prosperity from cyclones. The Project (CPP) has prepared by the Ministry of Disaster Management and Relief (MDMR), Government of Bangladesh and Bangladesh Red Crescent Society (BDRCS) and the main task was to develop structural response to cyclone disasters which includes cyclone shelters for pre-disaster evacuation shelters for livestock and an early warning system<sup>85</sup>.

In 1985 (after the 1985 cyclone) the Bangladesh Government with the support of (BDRCS) proposed to build multi-purpose small shelters near the affected coastal zone with water and sanitary facilities so that these shelters could be used as schools or health centers under normal circumstances to protect the lives of 3.3 million Bangladeshis living in exposed coastal zones<sup>86</sup>.

Following the devastating cyclones of 1991 the Government initiative of structural measures to mitigate cyclone disasters in Bangladesh revealed a history of mismanagement and failure of the Government previous and present to protect the people (poor and landless) from becoming the worst victims of these periodic disasters<sup>87</sup>. The Cyclone Preparedness Programme (CPP) undertaken in 1972 by Bangladesh Red Cross Society initiated the construction of multi-storied cyclone shelters, raised mounds (killas) for protection of livestock and setting up local disaster preparedness team with storm warning facilities but the status of these measures were highly questionable<sup>88</sup>.

Moreover the devastating cyclone of 1991 revealed the major drawbacks of the CPP in Bangladesh. The major limitations were building of cyclone shelter in remote areas, poor quality construction, lack of provision for maintenance of cyclone shelters, most of the shelters built twenty years earlier had already become derelict and abandoned and at the same time revealing

the crisis of governance<sup>89</sup> As such the natural disaster of 1991 could also be regarded as a “social and political disaster”<sup>90</sup>. Due to vulnerability of the population occupying char lands in the coastal areas, thousands of poor, landless and land poor peasants become exposed to the devastating cyclone and storm surges. This is not only a case of underdevelopment but also a case of social and political disaster and vulnerabilities other than “natural” in nature and context<sup>91</sup>.

The Current Phase 2000s onwards shows consistent changes in the prevention regarding cyclone preparedness and management, both structural and non-structural methods of cyclone management was emphasized with more importance to public participations and the multifarious role of various stake holders were emphasized that reflected a change in policy from the earlier traditional bias towards structural mitigation to more towards an integrated approach towards disaster management<sup>92</sup>.

The Disaster Management Bureau was established in 1993 with the Ministry of Relief and Rehabilitation (now existing as the Ministry of Relief and Disaster Management in order to strengthen the existing disaster coordination and relief management)<sup>93</sup>.

At present certain non structural measures have been undertaken to strengthen the disaster management regime in Bangladesh. The Standing Orders on Disasters (2010), The National Plan for Disaster Management (2010-2015) and The National Disaster Management Act of 2012 guides the disaster management system in Bangladesh as well as The Coastal Zone Policy 2005 (for 19 coastal districts of Bangladesh) and Associated Integrated Coastal Zone Management Plan (ICZM) 2005 (Bangladesh Economic and Climate Change Outlook 2012).

These major policy initiatives have been undertaken to strengthen the non-structural component of disaster risk reduction in Bangladesh. Emphasis has been put on to develop hazard specific multi sectoral disaster management plan which specified for Cyclone Shelter Plan for building cyclone shelters to face the challenges particularly arising out of cyclone and storm surges. According to the NPDM (2010-2015) the government as well as NGOs had constructed cyclone shelters in coastal belts of 16 districts of the country. The Report further states that out of 2852 shelters investigation have revealed that 2590 shelters are useable while 262 are not feasible<sup>94</sup>.

The government had been working on the Multipurpose Cyclone Shelter Programme (MCSP) Report recommended by Dr. Jamilur Reza Chowdhury for construction of multipurpose cyclone shelters. In this context the existing CPP (Cyclone Preparedness Programme) is to be strengthened for capacity building of the community at risk and the Disaster Management Bureau will facilitate the role of Local District Management Committee for each centre to guide its functioning<sup>95</sup>. To meet the future challenges of climate change and its impact the government proposed to develop Disaster Resilient Cluster Housing particularly for the households living in marginalized hazard prone lands (khas lands) to mitigate the impact of hazards and a Tsunami Response Plan following the devastating impact of Indian Ocean Tsunami of 2004<sup>96</sup>.

With this an effective cyclone warning system has been developed by the Meteorological Department of Bangladesh. The early warning system is to track the cyclone and inform relevant government agencies and public for taking precautionary measures to make advance planning for cyclone disaster management if cyclone hits the coastal areas. The Storm Warning Centre established in 1970s, a specialized unit of Bangladesh Meteorological Department (BMD) that



provides forecasting and issues warning signals at the national level based on meteorological data received from both national and international sources<sup>97</sup>.

The District Management and Information Centre has developed the information sharing centre for coastal zone cyclone management and for other disasters to provide information to related government agencies, NGOs, the private sector, regional and international agencies working for humanitarian assistance for emergency working for humanitarian assistance for emergency action and relief coordination during and after disaster strikes at the district and overall national level<sup>98</sup>.

### ***Disaster Management and Cyclone Sidr 2007***

In the context of Cyclone Sidr 2007 the efforts undertaken by the government for cyclone management and the current situation analysis reveals certain variations. An independent study undertaken for application of remote sensors and GIS for cyclone disaster management for the coastal district of Borgana, Bangladesh (one of the worst affected district due to Sidr Cyclone 2007) points out that emergency disaster management could be more effective with hazard vulnerability and risk maps of different areas that needs to be developed and strengthened<sup>99</sup>.

A particular case study of Bangladesh Cyclone Sidr on Hazard Warnings and Compliance with Evaluation Orders points out that contrary to the reports regarding information of approach of Cyclone Sidr by government agencies and private sectors (newspapers, media and others) not all people were aware of cyclone warnings (particularly fisherman who went fishing and did not hear the warnings prior to the landfall of the cyclone). Moreover the warning signals reach was

uneven in the districts (Borgana and Pirojpur) that were badly impacted by Sidr besides other factors taken into account (like compliance with evacuation orders)<sup>100</sup>.

According to an independent case study though the government's emergency response should not be considered a success yet it was better compared to its efforts in 1991 cyclone. According to the study despite concerted efforts by the Government of Bangladesh there were lapses in cyclone warning and evacuation procedures which leaves the gaps to be filled in order to better prepare the coastal community in future for cyclone preparedness and management<sup>101</sup>.

Similarly to this another independent study conducted post Sidr 2007 related to cyclone shelter preparedness presented a detailed report on post-cyclone Sidr Family Shelter Construction in Bangladesh (2007-2009) built within the last two years after cyclone Sidr with the help of donor partners (both national and international). These cyclone shelters were mentioned as core family shelters or Transitional Shelters built to provide post relief and response to cyclone preparedness in Bangladesh<sup>102</sup>.

The Report (post-Sidr 2007) further spells out both the strength and weaknesses of the programmes and the experiences of the community and the family affected by cyclone Sidr. The case histories in the report presents both the good and bad practices so as to ensure that future shelter responses must be better than what has been achieved at the present<sup>103</sup>

According to the Report (2009) on Cyclone Shelter Information for Management of Tsunami and Cyclone Preparedness (Annexure C) prepared by MoFDM, Government of Bangladesh and Comprehensive Disaster Management Programme an Integrated Coastal Zone Management Plan

(ICZMP) of the Water Resources Planning Organization (WARPO) has been prepared for the coastal areas of Bangladesh, comprising of 19 districts, located in the southern part of Bangladesh coming under the influence of tropical cyclones, storm surges and Tsunami's due to its location in Bay of Bengal<sup>104</sup>. Out of 19 districts, 16 districts have been chosen (those badly affected by Cyclone Sidr 2007) for this project to update the information on cyclone shelter management<sup>105</sup>

After Cyclone Sidr the survey identified a total of 3,753 cyclone shelters and school buildings with a detailed Cyclone Shelter Capacity and Vulnerability Analysis mentioned in the Report. The Report further stated that delineation of catchment areas for each cyclone shelter should be taken into consideration for evacuation planning and shelter management practices.

This brings forth the assessment that cyclone preparedness and management needs further strengthening to reduce vulnerability of the population concerned. A detailed information, specific location, capacity and description of every shelter is provided in Annexure – A of the Report on Cyclone Shelter Information for Management of Tsunami and Cyclone Preparedness (2009)<sup>106</sup>.

The Government of Bangladesh following Cyclone Sidr 2007 in collaboration with development donor partners prepared Joint Report titled “Cyclone Sidr in Bangladesh – Damage, Loss and Needs Assessment for Disaster Recovery and Reconstruction Report” (March 2008) that conducted the estimated damage and loss incurred from the disaster in various sectors. The Report also focused on recovery and reconstruction of the various sectors to assist the government for mitigation in both short term and long term plan<sup>107</sup>.

Short term plan for recovery focused on humanitarian assistance (food, security, healthcare and shelter) whereas medium to long term assistance concentrated on the recovery of agriculture, industry and commerce, restoration of livelihoods and reconstruction of infrastructure (housing, embankments, roads, bridges and shelters) as well as to build the local capacity to face future challenges<sup>108</sup>.

The Report on cyclone Sidr further stated that there is the need for improvement of disaster response and preparedness at the local level, capacity building must be integrated into the district level administration for proper maintenance of cyclone shelters as well as provisions for immediate rescue and evacuation and better information of impending disasters with short term contingency plan as well as long run mitigation, recovery and reconstruction must be generated to reduce the increasing vulnerability of the people through proper sustainable development plans and policies<sup>109</sup>.

Regarding Post – Sidr Housing Recovery scenario a study was conducted “Bangladesh Recovery Framework Case Study”(2014) to develop a guiding framework for developing disaster recovery framework by the World Bank’s Global Facility for Disaster Reduction and Recovery (GFDRR), the UNDP and the European Union (EU) to help the government and development partners to plan for resilient post disaster recovery, contributing towards long term sustainability development. The key findings of the study revealed mixed experiences<sup>110</sup>.

The Report (2014) also pointed towards the major drawbacks in legal instruments to guide post disaster housing recovery programme. The post Sidr experience once again brought forward the big gap in post-disaster recovery efforts that exposed the lack of clarity in existing institutional

mechanisms to manage housing recovery. Moreover the post disaster housing recovery is not mandated to any one particular agency of the government<sup>111</sup>.

While the overall management of disasters rests with the National Disaster Management Council headed by the Prime Minister, the responsibility of different ministries in housing recovery is not clearly mentioned in the main legal framework of disaster management and other legal frameworks that guides disaster management system in Bangladesh<sup>112</sup>. The study further recommended for the development of a national recovery monitoring system, strengthening resource allocation and land tenure issues and develop a building code as well as to transfer technical knowledge to build resilient structures to the local people<sup>113</sup>.

The recurring incidence of cyclone annually and weak management scenario has once again reiterated that disaster management (mitigation, preparedness, recovery and reconstruction) has a long way to go in case of Bangladesh. The structural and non-structural measures must be incorporated to strengthen the cyclone preparedness programme and the need to move from recovery to reconstruct programme with the objective of “building back better” for sustainable development of the affected areas.

Alternative strategies and mechanism must be incorporated to strengthen the dominant approach on disaster management where community participation must be ensured at every stage of policy making for constructive result though at time this may be impacted by power network relationships working during humanitarian assistance<sup>114</sup>

Moreover to reduce the vulnerability of the community and assist sustainable adaptations to natural disasters, the government must strengthen the local administrations and infrastructure particularly Union Parishads for engaging in relief operations (relief distribution, monitoring and evacuation) as well as strengthening other areas (such as communication, transport maintenance, embankments and multipurpose cyclone shelters) so as to establish a working relationship between Union Parishads (local level administrative unit) and Community Based Adaptation Committee (CBAC) in order to reduce vulnerability of the communities to cyclone disasters in Bangladesh. This makes the role of civil society imperative to create social awareness towards disaster preparedness of the people and the community at large<sup>115</sup>

### **Disaster Management: Development, State and Governance**

Mainstreaming disaster management in national development plans and policies is an effective way to address the vulnerability factor of a large section of the population particularly the poor and the marginalized impacted most by the disasters. Disaster also impact the development scenario of the country which in turn must be addressed to reduce disaster risk and human security concerns by bring in the question of development.

Development in the context of Bangladesh has always been addressed in terms of socio-economic growth. Bangladesh has traditionally been regarded as a “basket case for development” and the role of foreign aid and donor policies have influenced the perceptions in the development strategy of Bangladesh<sup>116</sup>. The noted economists Rehman Sobhan points that foreign aid or assistance is the mechanism to influence the economic policies of the recipient countries and in this case Bangladesh. With independence the development scenario in

Bangladesh was characterised by “aid dependence” which later on was moving towards self reliance by adopting liberal economic policies. But with heavy dependence on foreign assistance domestic economic policies was highly influenced by donor perspectives.<sup>117</sup>

The nature of aid that Bangladesh started receiving after its liberation in 1971 was more in the category of humanitarian assistance from donor countries. With passage of time this perspective has become more institutionalized to finance development projects within five-year plan perspective. There is a recognition of the fact that humanitarian element underlies the donor’s aid policy but there also exists an “aid politics” according to Rehman Sobhan between the declared objective of humanitarian assistance and promotion of commercial interests (export promotions) and geopolitical interests (such as political stabilization of friendly governments). Foreign assistance even if it is humanitarian in nature impacts the domestic socio-economic policies of the country<sup>118</sup>.

In case of Bangladesh international financial assistance came through the civil society organizations to carry out poverty alleviation and social development programmes. Particularly the micro-credit programme of the Grameen Bank and other welfare programmes carried by Bridging Resources Across Communities, formerly known as Bangladesh Rural Advancement Committee (BRAC) and other non-governmental organizations. The success of the microcredit programme at the grassroot level is the combined effort of donor assistance and a vibrant civil society and initiative to bring in social development at the forefront of development agenda in Bangladesh<sup>119</sup>.

Humanitarian assistance has been a major component of disaster risk reduction programmes and policies in Bangladesh mostly forwarded through various civil society organizations and non governmental organizations which was considered more transparent than other political units by the donor partners. This also brings in the issue of governance as ultimately managing of disaster management related activities such as relief, response, recovery and preparedness depends on effective governance capacity of the state and the functioning of the government and the civil society in public sphere<sup>120</sup>.

It has been widely acknowledged that “good governance” is an internal issue of democratic governance of the state, yet in case of Bangladesh donor support towards good governance is a key component to provide foreign assistance to various development plans and policies in Bangladesh. The notion of good governance is multidimensional in nature, first appearing in development studies in the context of debt ridden Sub-Saharan in the much acclaimed Report of World Bank (1989)<sup>121</sup>. The World Bank Report 1992 “Governance and Development” has further highlighted the linkage between “good governance and development” that “is epitomized by predictable, open and enlightened policy making, a bureaucracy imbued with a professional ethos, acting in furtherance of public good, the rule of law, transparent processes and a strong civil society participating in public affairs”<sup>122</sup>

The concept of governance is increasingly being invoked in development literature to make governance in developing countries more effective and participatory in nature. The state of governance as put forth by Md. M. Khan, in Bangladesh shows all the symptoms of an underdeveloped polity where democracy as a system of governance is yet to be institutionalized,



marked by corruption, power and authority concentrated at the highest level, leaving very little authority being delegated to local level administration, worsening human rights situation, increasing military expenditure, lack of accountability and transparency and increasing politicization of the bureaucracy<sup>123</sup>.

This presents a dismal shape of the state of governance in Bangladesh which shows little sign of progress. This is also evident in the case of local governance in Bangladesh where the government has failed to ensure good governance despite the enactment of The Local Government (Union Parishad) Act of 2009<sup>124</sup>. In this context Md. M. Rahman states that the most serious obstacle to development in Bangladesh is the resultant of worsening governance situation due to the culture of confrontational politics and corruption<sup>125</sup>.

### **Disaster Management and Civil Society**

While addressing the issue of governance and development the aspect of accountability has been stressed upon to bring about an integrated governance model where accountability, transparency and performance bring out the desired services emphasising the role of the multi stakeholders. In this integrated governance approach acting as a pre-requisite for sustainable market oriented development the state, private sector and civil society work in close cooperation and coordination to bring the desired sustainable development to secure the lives of the people in Bangladesh<sup>126</sup>.

Broadly speaking civil society serves as a link between the realm of the state (defined by a set of laws, norms and institutions for the purpose of governance, structuring and controlling a well

defined territory) and the realm of the society (defined as an aggregate of individuals living together as a organized, well ordered community)<sup>127</sup>.

Civil society is usually regarded as the “arena where citizens protect their freedom from the state on the one hand and market on the other”<sup>128</sup> Civil society for some acts as a “space” between state and market, a public sphere, while for others it works as a collection of organizations diverse in nature yet committed to a set of normative goals to achieve public good<sup>129</sup>.

In case of Bangladesh, a dominant feature has been the presence of extensive and high profile non-governmental sector particularly dominated by the “development non-governmental organization” (NGOs). David Lewis describes them as the vibrant institutions due to the proactive role played by the non-governmental organizations in the development process since independence in 1971 that can be stacked under the broader umbrella of civil society. The void created by poor governance and growing inequality in Bangladesh highlighted the crisis in governance which was filled by the development of non-governmental sector including civil society organizations (CSO’s) also denoted by the presence of civil society<sup>130</sup>

A number of factors were responsible for the emergence of organized, committed and encompassing civil society organizations in Bangladesh. The country has a long historical tradition of voluntary action in political participation (Bhasa Andolon), the large inflow of foreign aid for developmental policies and a weak unresponsive bureaucracy that created the “space” for civil society action. Development was the basic necessity of the political system to provide the services as expected by the state machinery. But the failure of the state to address the

issues of development, poverty and empowerment to the people reflected in the rise of civil society organization working in the socio-economic and political field<sup>131</sup>.

Particularly in Bangladesh, Grameen Bank and BRAC (Bridging Resources Across Communities, formerly known as Bangladesh Rural Advancement Committee) has been provided international recognition and applauded for their grass root level action to reduce poverty and women's empowerment. This also reflects the weakness of the state's ability to provide public goods and services to its citizens<sup>132</sup>.

Looking through the prism of civil society narrative in case of humanitarian assistance for natural disaster management D. Lewis points out that the combination of massive post colonial after war reconstruction effort in 1971 and the devastating cyclone that soon followed created a huge local and international relief and reconstruction measure sowing the seeds of NGO sector in Bangladesh. Continued problems of underdevelopment, widespread disillusionment with the political system with top-down approach of the military regimes and recurring natural disasters, relief and development was taken up by the NGO'S established by the civil society members of the new emerging middle class in Bangladesh. Also becoming the larger recipient of international development assistance these local NGO's acquired a distinctive identity working in emergency relief work and service delivery across various sectors<sup>133</sup>.

Particularly the role of BRAC starting its journey as a humanitarian relief organization in 1972 and later transforming into a multifaceted development agency, Grameen Bank experimenting with the innovative concept of "microcredit financing" to address rural poverty and women empowerment successful to a massive extent possible to uplift the rural poor, Prosiksha a pro left

civil society organization undertaking development and community organizing work, linking with grass root empowerment politics and service delivery for a wide range of sectors as well as other local NGO's associated with relief and development and engaged in capacity building of the communities across the country<sup>134</sup>

In field of humanitarian assistance and relief as well as in disaster management the international and national NGOs have played a decisive role in Bangladesh. Following independence and the devastating cyclone (1970) it created huge international and local relief efforts that made Bangladesh the ever largest recipient of international development assistance. In the initial stage, the non-governmental community was dominated by international NGOs such as Oxfam, CARE, Bangladesh Red Cross and Red Crescent Society (IFRC) and others which were mainly concerned with emergency relief and reconstruction and later on joined by local NGOs such as Grameen Bank, BRAC and Proshika Practical Action and a host of national and international NGOs undertaking "capacity building" of the community for development of social capital and community empowerment to recover and reconstruct from the impacts of disasters that strikes the people and the land of Bangladesh regularly<sup>135</sup>

According to the Asian Development Bank Report 2011, a large number of non-governmental organizations and development partners are engaged in disaster management in Bangladesh to build the resilience of the community to disasters, and promoting people's welfare through grass root initiatives and development programmes in the country<sup>136</sup> This also highlights the bottom-up approach and community based disaster management practices to be put into effective usage to address disaster management in Bangladesh<sup>137</sup>. Bangladesh has been trying hard to develop an

effective system of disaster management to address all the stakeholder's participation in the management of disasters.

Working in the field of Community Managed Disaster Risk Reduction Programme (CMDRR) the NGOs and CSOs are trying to strengthen the core services for capacity building of the communities to disaster preparedness of the communities impacted by natural disasters in the country. The CMDRR programmes are being conducted to build resilience of the communities to handle impacts of disasters and “building back better” keeping the post- 2015 disaster framework applicable in the context of disaster scenario.

The capital city Dhaka has now become a place for livelihood security to all those who are migrating from the rural areas due to flood and cyclone disaster. As a result population density of Dhaka has increased to unprecedented level and any disaster event is going to badly impact the security of the people. Various stakeholders are creating awareness and educating the communities regarding disaster risk reduction and capacity building. At the lowest level of governance involvement of the local level administration must ensure for integrating people in the decision making process for better informed decisions to be formed with regards to building resilience of the communities towards disaster.

To address the natural disaster scenario in Bangladesh within a proper perspective a **field survey** was conducted in the disaster prone areas adjacent to Dhaka to understand the situation of disaster preparedness and mitigation scenario of the country. A detailed conversation with community members, villagers and womenfolk was considered that showed the level of the disaster preparedness and mitigation being challenged at all levels of governance. Living with floods has become a way of live for the people of Bangladesh. Immediate relief after the floods

follows but rehabilitation is very slow even at times it takes years to rehabilitate and bring agricultural land under cultivation that has been degraded due to heavy sand casting as a result of floods.

The core services like drinking water supply, reliable energy, health services particularly of the women and children and economic security of the home and the womenfolk is highly compromised during and after floods. This has also led to the rural- urban migration with pressure of Dhaka and other cities growing with each passing day.

During and after Sidr 2007 cyclonic devastation followed by Aila in 2009 and recurring flood disaster badly impacting the livelihood and development of the region. Living with floods and flooding of the coastal areas and fear of cyclone in coming future is not unexpected. Immediate relief after the disaster followed but rehabilitation has been slow and at times it takes years to rehabilitate and bring agricultural land under cultivation that has been degraded due to floods and salinization as a result of coastal flooding

Conversation with members of the NGOs both international and local working in the field of disaster preparedness reaffirmed the strengthening the core issues like drinking water, health, sanitation, energy supply, education especially for girl child and economic security by employment and agricultural support not only for menfolk but empowerment of women is a necessity to build resilience to disasters.

Currently a number of projects being implemented by CARE Bangladesh, which includes Building Resilience of the urban Poor (BRUP), Enhancing Inclusive Resilience in Bangladesh Project (DIPECHO VIII), Pathways to Secure and Resilient Livelihoods, SHOUHARDO II Program, Where the Rain Falls (WtRF). Building Resilience of the Urban Poor (BRUP) project

is being implemented by a local partner named Village Education and Resource Center (VERC)<sup>138</sup>.

The project is being implemented in Gazipur City Corporation (GCC) area. Focusing on disaster risk reduction, the project contributes to achieving a paradigm shift in disaster management from conventional response and relief to a more comprehensive risk reduction culture. The overall goal of this project is to enhancing resilience of six targeted urban communities and three targeted institutions reaching a total of 8000 individuals (directly and indirectly) who can prepare for, mitigate, respond to, and recover from shocks and stresses<sup>139</sup>.

Working at both community and institutional levels, CARE implements BRUP in Gazipur, home to several garment factories and industries which are vulnerable to various hazards such as water-logging, fire and earthquake. Particularly 360 poor and extremely poor women in the six targeted communities are empowered to become better risk managers at the household and community levels, influencing decision-making related to disaster risk reduction (DRR)<sup>140</sup>. This shows that various civil society and non- governmental organizations are involved in capacity building exercises to strengthen the vulnerabilities and risk scenario in Bangladesh.

The questionnaire survey carried for this purpose also substantiates the fact that for long term sustainability, disaster management policies must be strengthened to bring in the desired result. It has been observed during analysis on the question of the role of the state in Bangladesh in addressing disaster vulnerabilities, 55% of the total respondent agreed that to a greater extent that all the stakeholders and particularly the state is the major component of disaster risk reduction in Bangladesh.

The state to a great extent has been able to incorporate disaster plans and policies in the development process addressing long term sustainable development for the country. Interestingly in this group quite a few of the respondents were of the opinion that mainstreaming of disaster management in plans and policies have been rather slow. On the issue of effective governance in addressing disaster vulnerabilities 75% of the respondents expressed that at times governance in the public sphere has been less than effective

The opinion survey clearly brought out the role of the civil society organization in disaster management in Bangladesh. The 90% of the respondents were of the opinion that in Bangladesh the civil society organizations are very active during and after disaster events and also plays an effective role in early response and recovery for disaster mitigation. The civil society in Bangladesh works more successfully in creating awareness on disaster issues. Some of the respondents had opinionated that the state must play a major role in disaster management since the state represents the large scale structural apparatus to manage natural calamities.

Against the above backdrop **in conclusion** it could be stated the perception and analysis of various existing plans and policies and mechanisms related to disaster management in Bangladesh brings forth the structural and non-structural framework that has been applied to address the issue of disaster management in the country in relation to natural disaster risk reduction in the light of specific case studies. In this context it could be stated that both policy and institutional-structural level mechanisms are effective measures to deal with the devastating impact of multiple disasters almost faced every year by the country.



The chapter also brings out the between natural disaster scenario and sustainable development in the context of Bangladesh and how vulnerability of the people due to a number of factors (particularly socio-economic) makes them insecure. The ways and means to drive human security in the context of Bangladesh has been done by mainstreaming disaster management in national plans and policies where various stakeholders and civil society has played an important role to drive development home.

Disaster management in Bangladesh has undergone a complex process of development with the state not left far behind to address disaster issues. Particularly a more concerned effort started following the Hyogo Framework of Action (2005) to systematically address the issue of disaster management. This also brought out a more “collaborative approach” where all the development partners and other stakeholders were engaged to develop a working system of disaster management for the country.

Keeping the current scenario in mind Bangladesh has a long way to go to strengthen vulnerabilities and risks associate with disasters. By addressing policy issues and mechanisms related to threats arising out of natural disaster which is one of the most crucial reasons for human security concerns in Bangladesh the task entails long term mitigation efforts.

This brings logically to address and examine the extent of policy and institutional level mechanisms undertaken in India for disaster management that would be attempted in the following chapter. The next chapter will deal with the disaster management framework in India and will try to find out how far India has been successful in mainstreaming disaster risk reduction in its development agenda to ensure sustainable development and human security.

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## *CHAPTER – V*

### *Natural Disaster Policy and Management in India*

#### ***Introduction:***

India is one of the oldest civilizations with an ancient history and a colonial past that steers the trajectory of the new nation in modern South Asia. India being situated within the Indian sub-continent represents “a historical and cultural heritage” which is five millennia old containing multiple layers and strands of cultural influences subjected to diverse interpretation<sup>1</sup>. India being one of the oldest civilizations represents identities that are strongly influenced by the past which helps us in understanding the present in the contemporary world<sup>2</sup>.

India emerged on the international scene on 15<sup>th</sup> August, 1947 following the anti-colonial movement and struggle for freedom with partition from British colonial rule.<sup>3</sup> With this India became the largest and most powerful country in South Asia with the realization of its dominant position in the Indian sub-continent due to its sheer natural position of regional predominance as a result of its size, population and relative power in comparison to the other states in South Asia.<sup>4</sup> In the current millennium India presents a contrasting picture of rising economy and geostrategic power in the international arena<sup>5</sup> and at the same time exhibiting definite constraints on the state and its polity.<sup>6</sup>

India situated within the South Asian region also represents a vast geographical space stretching from the Himalayas in the north to the Indian Ocean in the south, from the Indus Valley in the west to the plains of the Brahmaputra in the east. Geography plays an important role in

determining the contextual space of a country that makes a nation. As K.J. Schmidt remarks “geography have a significant effect on the overall development of human cultures.”<sup>7</sup> India is situated within the broader region of South Asia comprising a geographically distinct sub-system within the international system<sup>8</sup> (See Map 5.1).

*Map 5.1: Map of India in South Asia*



*Source: Ref: <http://www.worldatlas.com/webimage/countrys/india/asia/in.htm> [Accessed on 30 November 2015]*

A closer examination of the geographical location of the countries of South Asia reveals a close proximity among the countries of the Indian sub-continent sharing certain commonalities (in terms of history, culture, language) where as other variables in terms of socio-political, socio-economic and socio-religions elements they exhibit stark differences. Scholars are also of the view that the region is also characterized by considerable internal diversity, linguistic differences as well as a range of distinctive political systems. In spite of the distinctive differences the region imbibes certain forces that provides it a unity within which the cultural, economic and political integration has been realized.<sup>9</sup>

The course of South Asian region's history is due to its distinctive geography and location. It also presents a well defined geopolitical region with a shared social, cultural and civilization past and a colonial history that has impacted inter-state relations in the post colonial era.<sup>10</sup> The entire national building process of the India sub-continent makes it a unique region that has entered the present millennium as South Asian community, geopolitically and geo-physically divided into seven nations by historical inheritance.<sup>11</sup> India well established within the region of South Asia has continued to evolve with time to occupy a dominant position in the India sub-continent.<sup>12</sup>

India also has a history of disasters and this "disasterscape" of natural hazards has been well documented by scholar and academics that de-myths the oft repeated claim of natural disasters being only "natural in origin" and puts forward the socio-economic factors as the cause for the recurrence of disasters .<sup>13</sup> Until recently natural disasters in history had been relegated to the fringes within a larger narrative, even as their impact on human lives has often proved critical. Analyzing the history of natural disasters in India scholars have tried to highlight disasters events to understand the co-relational linkages between the nature of state and society and the

established perceptions to understand natural disasters in terms of socio-economic and socio-political impact. This provides an understanding of natural disaster from a socio-economic and political perspective.<sup>14</sup>

India has been one of the worst impacted countries in South Asia from natural disasters in terms of annual loss of life and properties. Citing the incident of disaster events like the Bengal Famine of 1943 in which 1.5 million died was caused by a confluence of factors both natural and man-made and due to the policy of the colonial government converged and changed the records forever.<sup>15</sup> According to the current global database for disasters, India ranks third in the number of disaster events, second in number of disaster victims and fifth in economic damages due to natural disasters.<sup>16</sup>

Traditionally India has also been one of the most affected countries by natural disasters in the South Asian region.<sup>17</sup> The geophysical location, the multiplicity of rivers, the dense concentration of the population in the flood plain region, the socio-economic conditions and constraints of a developing economy with high incidence of poverty has exposed and added to the country's varied problems of development. The most critical challenge facing the country today is to reduce disaster vulnerabilities of the people. The management of disaster is a highly desirable and challenging effort that requires an in-depth inquiry into the matter.

### ***Geopolitical and Ecological Setting of India***

The geopolitical location of India is a strong determining factor in the Indian sub-continent. India geo-physically forms a unique physiographic unit distinguished by its diversity in the South Asian Region referred to as the "India sub-continent" and separated from Asia by the

inaccessible mighty Himalayan Mountain ranges in the north and north east as well as mountain ranges in the west. Situated in the north part of the Indian Ocean occupying the largest part of land mass of the India sub-continent, it enjoys a geo-strategic position unsurpassed by any other country of the region<sup>18</sup>. Geopolitically the country shares its borders with China, Nepal and Bhutan in the west and Bangladesh and Myanmar in the east. In the south a narrow expanse of Palk Strait separates it from Sri Lanka<sup>19</sup>.

Geographically India lies in the northern-eastern hemisphere of the globe extending from 8° 4' North to 37° 6' North; and 68° 7' to 97° 25' east, covering a total area of 32,87,263 (square kilometer) km<sup>2</sup> which is roughly 0.57% of the earth and 2.4% of the total area of the land hemisphere<sup>20</sup>. The maritime boundary of India extends up to 6100 kilometers along the main land mass which increases to 7517 kilometers including the vast coastline of Andaman Nicobar and Lakshadweep group of Islands<sup>21</sup>.

India is the seventh largest country of the world after Russia, China, Canada, USA, Brazil and Australia. In comparison to population-size, India occupies second in place in the world after China. Its population was 121 billion in 2011 compared to China's population of 134 billion and projected to outnumber China, reaching 1.6 billion mark by 2050<sup>22</sup>. India is one of the most densely populated countries of the world with current population estimated at 129 billion as of 2015, which is equivalent to 17.5% of the total world population with population density of 386 person per km<sup>2</sup> and 32% of the population residing in urban centers<sup>23</sup>.

The main channels of drainage of the land surface are the rivers and their tributaries. India is drained by two important drainage systems, the Peninsular and the Himalayan drainage system accommodating two widely divergent types of topography (See Map 5.2 – River Map of India).

*Map 5.2: River Map of India*



*Source: Ref: <http://maps of india.com/maps/india.river-map.html> [ Accessed on 30 November, 2015]*

The peninsular river drainage system and their tributaries reflect the last stages of river development, characterizing low gradients, slow movement of water except during floods and a low carrying capacity of deposition of silt.

The most notable feature in the peninsular drainage system is the eastern flow of rivers (Godavari, Krishna, Cauvery) contributing greatly to agricultural prosperity of the Deccan region, while the main west flowing rivers of central and southern India are Narmada, Tapi and Sabarmati<sup>24</sup>. Normally these rivers don not flood but occasionally heavy floods do occur as a result of extreme weather events.



The Himalayan river drainage system is comparatively of recent origins and differs from peninsular rivers both in nature and function. These three main river systems Indus (Sutlej) and Ganga and Brahmaputra and their numerous tributaries and distributaries are not only eroding and transporting agents but also deposit rich alluvial soils across the Ganga-Brahmaputra plains finally joining to the sea making the region highly fertile and productive. The Report of the Ministry of Water Resources, Government of India 2003 has highlighted the contribution of Ganges River System in the growth and prosperity of the agricultural productivity of the northern plains of India<sup>25</sup>.

The Indus river system mainly benefits Pakistan with total channel length of 2880 km (in India only 7009 km) and a catchment area of 1,165,000 km<sup>2</sup> (in India 321,290 km<sup>2</sup>). India can utilize only 4,195 million cubic meters (only 20%) out of its total discharge under the Indus Water Treaty of 1960<sup>26</sup>. The Ganges river system is the life-line of India which drains over a quarter of the country's surface area.

The flood plain is the granary house of the country supporting the largest concentration of human population. The Ganges basin covers 861,404 km<sup>2</sup>. The total length of the streams flowing throughout the Indian territory is 7552 km with numerous tributaries and distributaries particularly Kosi (Sorrow of Bihar) Son (Bihar) and Damodar (Sorrow of Bengal) considered notorious for flooding the Ganges plains and shared by seven states of the country<sup>27</sup>.

The Brahmaputra river drainage system is another important river system of India which it shares with Bangladesh (Padma) and China (Tsango in Tibet) occupying a total drainage area of

580,000 km<sup>2</sup> of which 258 km<sup>2</sup> lies in India particularly the course of river drainage impacting the state of Assam. The drainage system of the Ganga-Brahmaputra river basin represents major hydrological problems for the vast Ganges plain areas. During floods the rivers widen considerably flooding the vast expanse of the plains and damaging standing crops. Ganga regularly overflows its banks at several places. According to P. Nag and S. Sengupta the shifting course of river also brings troubles particularly for Kosi region in Bihar. Similarly the Brahmaputra river basin is subject to more severe flooding (impacting both eastern Indian states of Arunachal Pradesh and Assam and Bangladesh) bringing serious damages to crops, settlements and economic well being of the region<sup>28</sup>.

These rivers and their tributaries create a large network of river drainage system subject to heavy rainfall during monsoon bringing floods. At the same time the range of rainfall that India receives and the enormous flow of large rivers are sometimes hindrance to development. It is vital to note that floods are a serious problem particularly in the flood-plain region of the Ganges-Brahmaputra basin often subjected to heavy monsoon downpour and man-made causes such as deforestation, silting of the river bed, unplanned settlement activities in the flood plains, obstruction of the natural drainage by development activities to a major extent aggravated the problems of flooding in the country<sup>29</sup>.

The analysis of the climatic condition experienced by India reveals that the region is characterized by high humidity, heavy perspiration and marked seasonal variations. This tropical monsoon climate acts as a major asset for the agricultural sector. It has been noticed that India experiences seven climatic regions that primarily impacts the rural economy which is precisely dependent on monsoon. The variations and delays in the onset of monsoon have wider

implications. As a consequence abnormal climatic conditions results in floods and droughts that has serious implications for the Indian economy<sup>30</sup>

In terms of total land use area occupied in India, out of the total 172 million hectare of cropped land as much as 125 million hectare is used for producing food grains. In spite of climatic variations and a complex agro-ecological setup agricultural productivity is essential for internal consumption to meet the requirements of the population and to achieve food security<sup>31</sup> The geographical position of India and its relation with ecology and human settlement has a far reaching impact on the process of sustainable development in the region. Agriculture is the main source of livelihood for majority of the population in the country which to a large extent depends on fertile soil to generate substantial agricultural harvest to support a large and growing population.

India has a wide variety of soils among which approximately eight major types and thirty sub-types have been classified by the Indian Council of Agricultural Research (ICAR) based on international criteria of soil classification. Out of these, alluvial soils occupy the majority of the land area about 14.25 lakh km<sup>2</sup> area(43.4%) stretching from the river Sutlej in west of the Brahmaputra in the east<sup>32</sup>.

This rich diversity and natural texture of the soil had been modified due to the presence of multiple factors and also due to the human impacts on the environment such as shifting cultivation, water logging, salinity including coastal salinity, unscientific techniques of production, clearance of natural forest or grassland vegetation for cultivation on hill soils, deforestation, cultivation on the rich alluvial flood plain, use of fertilizers and contamination by pollutants in water (arsenic in ground water) and other associated problems<sup>33</sup>.

In India land degradation and soil erosion are major problems that impact the state of environment. The State of Environment Report, 2009, Government of India estimated that in India, approximately 130 million hectares of land area (45% of total geographical area) is affected by serious soil erosion<sup>34</sup>. In a similar note The State of Environment Report, 2013 Government of India estimated that 146.82 million hectares area suffers from various forms of land degradation due to wind and water erosion as well increase in salinity due to water logging caused by recurring floods, as noted by the National Bureau of Soil Survey and Land Use Planning (NBSS & LUP) and Indian Council of Agricultural Research (ICAR)<sup>35</sup>.

The Ganges, Brahmaputra and Kosi rivers carry huge amount of sediments that gets deposited on the river bed resulting in flooding due to defective drainage system and at times excessive rainfall. It is estimated that Ganges annually transports 36 million tons of eroded material from the plains to Bay of Bengal<sup>36</sup>. The bordering area of all the rivers of Assam and West Bengal suffer from soil erosion. The worst affected states due to soil erosion are Madhya Pradesh followed by Rajasthan, Uttar Pradesh, Maharashtra, Gujarat, Karnataka and Andhra Pradesh<sup>37</sup>.

The coastal zones of the eastern coast face the problem of soil salinity. The tribal areas of Assam, Meghalaya, Tripura, Nagaland, Mizoram, Kerala, Andhra Pradesh, Madhya Pradesh and Orissa suffer from the problem of soil erosion due to deforestation and shifting cultivation. It is estimated that roughly 43.61 lac hectares of the land area is affected by jhum farming and 15 lac (roughly) hectares of forest land is cleared every year<sup>38</sup>. According to the State of the Environment Report 2009, Government of India it is estimated that out of 305.9 million hectares of reported area, 146 million hectares of land requires soil conservation to restore the fertility of the land<sup>39</sup>.

The State of forests in India brings out the nature of resources, flora and fauna presenting the overall environmental scenario of the country. The State of the Environment Report (2009) noted that as per the 2005 assessment of the Forest Survey of India, the total forest cover is 677.088 square km which constitutes 20.60% of the geographical area of the country<sup>40</sup>. According to the Forest Survey of India, 2011 the total forest cover increased to 6,92,027 square km which constitutes 21.05% of the geographical area<sup>41</sup>. The forest area is unevenly distributed in India. The Peninsular hills and the plateaus have 57% of the total forested area of the country followed by 18% in the Himalayan region, 10% in the Western Ghats and the coasts and 10% in the Eastern Ghats and the coastal plains and 5% in the Ganga-Sutlej plains<sup>42</sup>.

Forests acts as the major source of natural resource that contributes to the economic and ecological stability of the country. Sal forest is the predominant forest occupying 116 lakh hectares and accounting for about 16% of the total forest area of the country. The Sundarbans referred to as the Mangrove Forest is world's largest single tract mangrove forest spreading across the border into the state of West Bengal, to some extent Orissa and other states in India<sup>43</sup>.

According to the State of the Forest Report (**SFR**)2013 mangroves in India cover 4,628 sq. km. which is about 0.14% of the country's total geographical area and accounts for about 3% of the world's mangrove vegetation and 8% of the Asian Mangroves<sup>44</sup>. Forests in India also support a rich biodiversity. It also acts as a natural embankment to coastal flooding in India. The period 2003-2005 saw the total forest cover decreased slightly by 728 sq. km. During this period there has been significant loss of forest cover in The Andaman and Nicobar Islands (178 sq. km.) cause of the Tsunami (December, 2004)<sup>45</sup>.

The exploitation of forest resources has damaged the forest ecosystem beyond repair. The expansion of agriculture, habitat destruction, over exploitation, pollution and soil degradation has resulted in imbalances in the forest ecosystem. This is further aggravated by natural disasters such as floods, droughts and cyclones. Due to soil degradation of hill slopes, recurrent flood has emerged as recurrent problems. According to an estimate India is losing 1.3 million hectares forest cover every year<sup>46</sup>. Regarding the status of forest in India, the successive and periodic assessment of forests provided by the Forest Survey of India, working under the Ministry of Environment and Forests, presents biannual reports that shows a decrease in the forest covering during the 1980s, which was arrested since 1999. During the period 1987-1997, the area under forests showed marginal fluctuation and since 1997 the total forest cover is estimated to increase from 63 to about 69 million hectare in 2011<sup>47</sup>.

The increase in forest cover has been observed since 2001 due to growing environmental consciousness for environmental protection and growing pressures of environmental groups (Chipko Movement) in association with various activities for protection and promotion of sustainable development. The forest cover not only substantiates the commercial purposes it also provides natural protection form soil erosion, soil degradation and water erosion due to flooding and coastal storm surges.

The forest in India is estimated to meet the direct livelihood needs of about 200 million people in about 1.73 lakh villages in and around forest area<sup>48</sup>. The following Table 5.1 presents the forest cover assessment from the period 1987-2005, as put forward by the Government of India on the status of forest cover in India. Similarly Table 5.2 presents the various categories of forests in India as estimated by the State of Forest Report (SFR) 2005 stands below as-

**Table 5.1: Forest Cover Assessment by Forest Survey of India from 1987-2005**

<i>Year of State of Forest Report</i>	<i>Data Period</i>	<i>Forest Cover/Free (sq. km.)</i>	<i>% of geographical area</i>
1987	1981-83	640,189	19.49
1989	1985-87	638,804	19.43
1991	1987-89	639,364	19.45
1993	1989-91	639,386	19.45
1995	1991-93	638,879	19.43
1997	1993-95	633,397	19.27
1999	1996-98	637,293	19.39
2001	2000	757,010	23.03
2003	2002	777,712	23.68
2005	2003	768,751	23.69

Source: Ref: India Forestry Outlook Study 2009 Ministry of Environment and Forest, Government of India and Food and Agriculture Organization (FAO) United Nations Available at [www.fao.org](http://www.fao.org) [Accessed on 28 January, 2016 at 2.01p.m]

**Table 5.2: Status of Forest Cover in India 2005**

<i>Category</i>	<i>Area (sq. km.)</i>	<i>Percentage of Geographical Area</i>
<b><i>Forest Category</i></b>		
<i>Very Dense Forest</i>	54569	1.66
<i>Moderately Dense Forest</i>	332647	10.12
<i>Open Forest</i>	289872	8.82
<b><i>Total Forest Cover</i></b>	<b>677088</b>	<b>20.60</b>
<b><i>Non-Forest Cover</i></b>		
<i>Scrub</i>	38475	1.17
<i>Non-Forest</i>	2571700	78.23
<b><i>Total Geographical Area</i></b>	<b>3287263</b>	<b>100.00</b>

Source: Ref: State of Forest Report (SFR) 2005. Ministry of Environment and Forest, Government of India State of Environment Report, 2009, Ministry of Environment and Forest, Government of India [Accessed on 26 January, 2016]

At present as per the State of Forest Report 2013, India's forest cover is 69.79 million hectare (including 4,628 sq. km. under mangrove which is 21.23% of the geographical area). This is an increase of 5,871 sq. km. in the forest cover of the country compared to 2011 assessment<sup>49</sup>. Even the current assessment year 2013-2015 in the State of Forest Report 2015 indicates an increase in

total forest cover by 5018 sq. km. Accordingly the total forest cover has increased by 21.34% in the last two years but saw a decline in mid dense forest cover<sup>50</sup>.

The examination of successive national plans and adoption of various policies projects focus on the need for the conservation of forests by ensuring the qualitative expansion of forests, increasing the output of wood products and improvement of natural forests cover through the policy of conservation and afforestation. This linkage between environment and sustainable development was highlighted in the National Report of India to 5<sup>th</sup> Session of the United Nations Forum on Forests<sup>51</sup>. Till the 1999 plan investment in the forestry sector was very low. The Forest Survey Report 1999 plan investment in the forestry sector was under 1% of the total plan outlay in the Ninth Plan. The policy and legal framework regarding the forestry sector has seen a major shift from the 1990s onwards. Earlier the focus was simply on forests and no intrinsic right to land. It was state subject and separate states promulgated separate legislations to meet the needs of the state. In the mid 1970s forestry was shifted from the state list to the concurrent list due to emerging ecological needs and growing environmental consciousness and rights of the land of the people residing in the out fringes of the forest and tribal areas<sup>52</sup>.

The shift in the forestry policy was evident as part of the rural development programme since the Seventh plan onwards that reflected a revolutionary shift in forest management from a regulatory to a participatory approach with the promulgation of National Forest Policy in 1988 (NFP). The NFP in 1988 for the first time envisaged people's participation and involvement in development and protection of forests. To strengthen the ecological and environmental security of the people and communities, the Government of India adopted in 1990, Joint Forest Management Programme (JFM) that highlighted the involvement of village communities and voluntary



agencies in the protection and development of forests. Till 2001, out of 173,000 villages in the forest fringes, JFM has been implemented in 61,000 villages and around 85,000 JFM committees have been formed covering 22 million hectares of forests<sup>53</sup>.

Enactment of legislations particularly the 73<sup>rd</sup> Amendment Act has made it mandatory for all the states to decentralize governance through participatory institutions. Among the 29 functions recommended for decentralization, three relate to forestry viz. social forestry, fuel wood plantation and non-timber forest products. This legal foundation has brought effective people's participation in forest protection and forest management<sup>54</sup>. The period from Seventh Plan onwards (1985-90) had placed greater emphasis on achieving sustainable development of forests. The NFP (1988) was formulated (4 years) before The Earth Summit (1992) that embodies the principle of sustainable forest management recognizing the role of forests as primarily an environment resource, strengthening the biological diversity, securing rural livelihood and environmental security for the future. The National Forestry Action Plan (NFAP) has been formulated which is a comprehensive plan for the next twenty years to achieve the goal of sustainable development of forests and to increase the forest cover of the country to 33% as mandated in the NFP (1988). The Eighth (1992-97) and the Ninth Plan (1997-02) gave priority to people's participation in forest conservation and management through the JFM programme<sup>55</sup>.

Till 2000, about 10.2 million hectares of degraded natural forests cover has been restored in the country. The Tenth Five Year Plan (2002-2007) had estimated the increase of forest cover to twenty-five percent (25%) and around thirty-three percent (33%) by 2012. But the fact remains that till 2015, India's forest cover is twenty-one percent (21.34%)<sup>56</sup> only. The Ministry of Environment and Forest which is the main agency has worked in the direction of laying down

regulatory framework to reduce environmental degradation, pollution from industrialization, focus on sustainable agriculture and forestry. At the same time importance has been attached to community participation to bring about sustainable ecological development in India.

In terms of biodiversity India geographically represents an ideal place for high degree of biodiversity variations. India with an area of 329 million hectares, with varied eco-climatic conditions sustains immense biological diversity at all levels. Occupying only 2.4% of the world's land area, India accounts for 7-8% of the recorded species of the world. Located in the tropical hot-humid climate, with heavy rainfall during the monsoon a vast landscape drained by major rivers of the Ganga-Brahmaputra delta, and the rich alluvial soil makes India rich in flora and fauna inhabiting different ecosystems, comprising of two biodiversity hotspots namely Eastern Himalayas and the Western Ghats, that is composed of a diverse ecosystems such as mountains, plateaus, rivers, forests, deserts, wetlands, lakes, mangroves, coral reefs, coastal and marine ecosystem<sup>57</sup>

The Sundarbans the largest single tract of natural mangrove forest of the world comprises of about 5% of the world's mangrove vegetation spread over an area of about 45,000 km<sup>2</sup> which is 0.14% of the total forest cover along the coastal states of India. Approximately 50% of the total area under mangrove cover is in West Bengal, followed by Gujarat and Andaman & Nicobar Islands. Sundarban is a unique habitat for a large number of wildlife species, flora and fauna, rich natural resources with wider implication for ecosystem of the country. The Tsunami that hit the Andaman & Nicobar Islands marginally decreased the mangrove cover of the country<sup>58</sup>.

Presently India has 661 nationally designated Protected Areas comprising 4.80% of the total geographical area of the country. The country also has 23 marine Protected Areas in peninsular

India and 106 in the islands<sup>59</sup>. Threats to biodiversity in India has been reported in the successive national reports to the convention on Biological Diversity under United Nations Environment Programme (UNEP) due to anthropogenic activities including developmental activities leading to change in land use pattern, habitat loss and fragmentation and widespread poverty leading to environmental degradation. To protect, preserve and promote the biodiversity of the country various policy responses has been generated by the state<sup>60</sup>.

The first major response came in 1999 when India developed a strategy for biodiversity convention and formulated the National Policy and Macro Level Action Strategy, 1999 followed by the Biological Diversity Act, 2002 and Biological Diversity Rules, 2004. The National Environmental Policy, 2006 was formulated to seek a balance between conservation of natural resources and development process. Earlier Wild Life Protection Act, 1972 and The National Forest Policy, 1988 was already under implementation to protect and preserve the environmental ecology of the country. National Wild Life Action Plan (NWAP)(2002-2016), National Biodiversity Action Plan (NBAP)-(2008) and the National Action Plan on climate change (2008) were formulated to address the issue of climate change. All these policy responses were generated to preserve and promote biodiversity, agricultural productivity and forestry to negate the environmental challenges generated by economic development in the country<sup>61</sup>.

India is richly endowed by water resources with twelve major river systems that drain the sub-continent forming a total catchment area of 252.80 million hectares along with the Ganga – Brahmaputra – Meghna (GBM) basin with a combined strength of 110 million hectares which is more than 43% of the catchment area of all the major rivers in the country. Water resource has been considered very crucial for sustaining life and agricultural productivity in the country.

Predominantly being an agrarian economy, water resource is very vital for economic productivity which is highly influenced by different hydrological climatic conditions 92% of water is utilized by this sector<sup>62</sup>.

India receives its water resources from the rainfall which is not evenly distributed and snow belts of the glaciers in the Himalayas out of which 80% of the 750 billion m<sup>3</sup> is used for irrigation purposes and rest 20% meets domestic, industrial, energy and other requirements. With rapid increase in population that is estimated to be around 1,640 million by the year 2050, fresh water resource is going to face severe strains for meeting the needs of domestic household, rapid industrial and agricultural – irrigational requirements<sup>63</sup>.

The pollution of water due to poorly managed irrigation practices has resulted in soil erosion, water logging and salinization of soil. Domestic, industrial and agricultural pollution has added to the problem of supply of fresh water resources for human consumption. Rainfall is not uniformly distributed in India and water scarcity is observed in Rajasthan, Gujarat, Madhya Pradesh and Peninsular India where demand for surface water is higher than the supply. The problem of salinity and arsenic contamination in the ground water resources has resulted into a major problem in the Bengal delta plain and found in South India impacting fresh water resources for consumption<sup>64</sup>.

The State of the Environment report 2009 recognized natural disaster as a major environmental hazard and the extent of its severity could be assessed in terms of its impact on human lives and socio-economic damages caused by these disasters. The report also addressed the issue of climate change. India has been identified in the context of global warming as the most vulnerable country to climate change due to its geographical position and high population pressure. Climate

change is going to have huge impact on arid and semi arid regions (North – West India), on agriculture, fresh water availability and land degradation. Intensification of monsoon is likely to contribute to flood disasters in the Himalayan region, rising temperature increase the risk of flash floods during wet season. Climate change has added a new dimension to environmental problems and natural disaster scenario in the country<sup>65</sup>.

The analysis of geo-political and ecological setting of India, its impact on the environment and the ecological sustainability makes it quite clear that the country is endowed with rich natural resources to progress towards socio-economic development. But the growing concern for sustainability is impacted by rapid industrialization, urbanization, deforestation, poor sanitation and population pressure. The degradation of the environment has become a major threat to the security of the people and the root of the problem lies in such factors as high concentration of population, scarcity of resources, uneven development, chronic poverty and failure of developmental policies. Natural disasters and climate change had further aggravated the security threats in the context of India.

### ***Natural Disaster scenario in India***

The natural disaster scenario in India presents a major problem for development prospects for the country. The regular and recurrent occurrences of natural disasters have added to the country's varied problems of development and 'security of the people'. India appears to be one of the most vulnerable fragile and disaster prone country with greatest disaster risk ranking index of 100 with disaster risk percentage of 7.17% at global level in the world according to the World Risk Report (2013)<sup>66</sup>. Particularly the unique geo-political location of India within the Indian sub-continent makes it highly vulnerable to natural disasters.

India is more than 1.2 billion people, face at least one or more natural disasters per year and has experienced the highest number of disasters with an increasing trend in terms of events and casualties during the past four decades from 1970-2009. (See Table 5.3) According to the global database of disasters, as estimated by Sapir- Debarati Guha, India ranks third in the number of disaster events, second in number of disaster victims and fifth in economic damage due to natural disasters<sup>67</sup>. According to World Bank Report 2003 India's annual loss to disasters was estimated to close to 2% of Gross Domestic Product (GDP) and upto 12% of central government revenues<sup>68</sup>. The Annual Report 2008-2009 of the Ministry of Home Affairs, Government of India has estimated that average annual loss of lives due to natural disasters in India is around 4500 and 40,000 livestock and over 1.5 million hectare of crops are destroyed every year<sup>69</sup>. The following Table (5.3) presents a clear picture of major disasters impacting on India:

**Table 5.3: Natural Disaster Statistics in India (1970-2009)**

<i>Disaster Type</i>	<i>Total Disaster</i>	<i>Total Casualties</i>		<i>Total Affected People</i>	
		<i>Total</i>	<i>Annual</i>	<i>Total US\$</i>	<i>Annual</i>
<i>Earthquake</i>	<i>20</i>	<i>50,000</i>	<i>1280</i>	<i>28 million</i>	<i>715,000</i>
<i>Flood</i>	<i>192</i>	<i>48,000</i>	<i>1230</i>	<i>783 million</i>	<i>20 million</i>
<i>Drought</i>	<i>9</i>	<i>320</i>	<i>8</i>	<i>961 million</i>	<i>25 million</i>
<i>Landslide</i>	<i>37</i>	<i>3,200</i>	<i>83</i>	<i>3.8 million</i>	<i>98,000</i>
<i>Cyclone</i>	<i>113</i>	<i>49,000</i>	<i>1260</i>	<i>84 million</i>	<i>2.2 million</i>
<b><i>Total</i></b>	<b><i>371</i></b>	<b><i>151,000</i></b>	<b><i>3860</i></b>	<b><i>1.86 million</i></b>	<b><i>48 million</i></b>

*Source: Ref: EM-DAT, 2010 Accumulated figures as presented in the World Bank Report (2012) "Disaster Risk Management in South Asia: A Regional View" World Bank GFDRR. Washington [Accessed on 05 August, 2015 at 12.04 p.m.] pp 65*

From the above table (5.3) it is quite clear that earthquakes, floods and cyclones are the major disasters followed by landslides, droughts and others that impact the socio-economic level of development in India. The number of events is the highest for floods followed by cyclones and

the percentage of people killed and affected is much higher in case of floods and cyclones as well as earthquakes (though total disaster events in the period 1970-2009 is much less than in case of floods and cyclones) compared to landslides and droughts. India faces highest incidence of cyclone and floods and highest number of people affected by these two major natural hazards. The following Table (See Table 5.4) shows people affected and damages due to natural disaster in India during the period 1985-2001. It clearly indicates that the disasters are one of the major sources of insecurity for the people of the country.

**Table: 5.4: Damage and Loss due to Natural Disasters in India: 1985-2001**

<i>Year</i>	<i>People affected (Lakh)</i>	<i>Houses &amp; Building, partially or totally, damaged</i>	<i>Amount of property damage/loss (Rs. in crores)</i>
1985	595.6	2,449,878	40.05
1986	550.0	2,049,277	30.74
1987	483.4	2,919,380	20.57
1988	101.5	242,533	40.63
1989	30.1	782,340	20.41
1990	31.7	1,019,930	10.71
1991	342.7	1,190,109	10.90
1992	190.9	570,969	20.05
1993	262.4	1,529,916	50.80
1994	235.3	1,051,223	10.83
1995	543.5	2,088,355	40.73
1996	549.9	2,376,693	50.43
1997	443.8	1,103,549	n.a.
1998	521.7	1,563,405	0.72
1999	501.7	3,104,064	1020.97
2000	594.34	2,736,355	800.00
2001	788.19	846,878	12000.00

*Source: Ref: Annual Reports, Natural Disaster Management Division, Ministry of Agriculture in "Disaster Management in India: A Status Report" August 2004. Government of India [Accessed on 12 February 2015 at 1.06 p.m.] pp 63*

The following table 5.5 gives a detailed description of year-wise damage caused due to natural disasters during the last ten years in India. The data clearly indicates the human security concerns in relation to disasters.

**Table 5.5 Year wise damage caused due to floods, cyclonic storms, landslides etc. during last ten years in India**

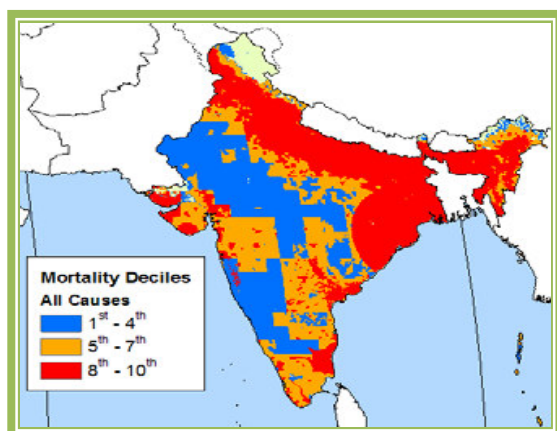
Year	Live Lost Human (in no.)	Cattle lost (in no.)	Houses damaged (in no.)	Cropped areas affected (in Lakh hectares)
2001-02	834	21269	346878	18.72
2002-03	898	3729	462700	21.00
2003-04	1992	25393	682209	31.98
2004-05	1995	12389	1603300	32.53
2005-06	2698	110997	2120012	35.52
2006-07	2402	455619	1934680	70.87
2007-08	3764	119218	3527041	85.13
2008-09	3405	53833	1646905	35.56
2009-10	1677	128452	1359726	47.13
2010-11	2310	48778	1338619	46.25

Source: Ref: Disaster Management in India Report 2011. Ministry of Home Affairs (MHA) Government of India [Accessed on 12 April 2016 at 5.59 p.m.] p 10

The Natural Disaster Hotspots: A Global Risk Analysis Report (2005) considers India as a major hotspot for natural hazards and risks<sup>70</sup>. The following maps of mortality, GDP impacted and multi hazard risk hotspot by hazard Groups (Top Three Decile) presents a clear picture of multi hazard risk hotspot and risks that India faces annually. See Map 5.3 and 5.4

**Multi-Hazard Disaster Risk Hotspots (All Hazards combined and weighted by Mortality and Proportion of GDP Impacted) –**

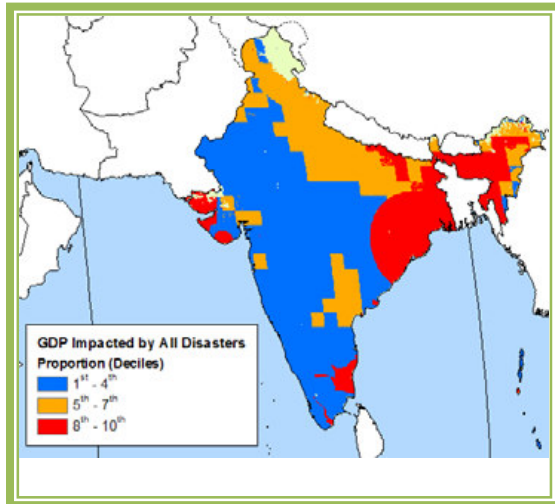
**Map 5.3: Mortality Deciles: Multi-Hazard Risk**



Source: Ref: The Earth Institute, Centre for Hazards and Risk Research Columbia University “India Natural Disasters Profile” [www.ideo.columbia.edu](http://www.ideo.columbia.edu) [Accessed on 08 February 2016 at 3.45 p.m.]



**Map 5.4: GDP Impacted by All Disasters**



*Source: The Earth Institute, Centre for Hazards and Risk Research Columbia University “India Natural Disasters Profile” [www.ideo.columbia.edu](http://www.ideo.columbia.edu) [Accessed on 08 February 2016 at 3.45 p.m.]*

The natural multi-hazard hotspot map as projected above indicates that cyclones, floods, drought and earthquakes pose greatest risk to India on country level. On a sub-national level floods, droughts significantly impact majority of India largely prevalent in the north eastern, eastern and north western parts. The Himalayan region is affected by geophysical hazard, particularly earthquakes where they rank in high mortality rate and low for GDP impact.

Cyclones influence a relatively small area of the country (the vast coastline of 7516 km out of which 5700 km is prone to cyclone) but have high-ranking mortality and GDP impacts. The combined multi-hazard maps for mortality and GDP shows that almost the entire country is significantly impacted by at least one hazard and mortality impacts are concentrated in north, north eastern and the coastal regions of the country<sup>71</sup>

According to the Vulnerability Profile Atlas Map of India (2006) India is vulnerable in varying degrees to large number of disasters. Almost more than 58.6% of the landmass is prone to

earthquakes ranging from moderate to high intensity, over 40 million hectares (12%) of its land is prone to floods and river erosion, out of 7516 km vast coastline, about 5700 km is prone to cyclones and tsunamis, 68% of the cultivable area is vulnerable to droughts and hilly area of the sub-Himalayan range and Western Ghats are at risk from avalanches and landslides<sup>72</sup> (See Annexure Maps IA, IB, IC, Earthquake, Cyclone and Flood hazard map respectively)

### ***Vulnerability to major natural disasters***

India is a disaster prone country. With a growing population of more than 1.2 billion and population density of 386 persons per sq, occupying a territorial area of 32,87,263 square kilometer with a vast coastline (5700 km) exposed to cyclones, storm surges and tsunami the country remains vulnerable to natural hazards. In the world India is one of the ten worst disaster prone countries which puts it in the high profile vulnerability risk index that the country faces indefinitely in terms of loss of lives<sup>73</sup>. During the last three decades (1998-2010) on an average, natural disasters in India have claimed a total death of 1,43,039 (people) on an average more than 4,768 death toll every year<sup>74</sup>.

India's 3.29 million km. sq. area, about half is prone to moderate to severe seismic activity. The tropical cyclone hits the vast coastline forming in the Bay of Bengal and the Arabian Sea. One-third of India's total area is prone to severe floods and droughts besides landslides, heat waves, and thunderstorms<sup>75</sup>. According to the estimates of World Disaster Report, 1999 in India, the decade of 1988-1998 witnessed disasters that killed 5,116 people and affected 24.79 million every year. In 1998 this figure increased to 9846 people who died and 34.11 million people were affected by disasters<sup>76</sup>. The Government of India in its "Status Report on Disaster Management (2004)" pointed out that in the decade 1990-2000 an average about 4344 people lost their lives and about 30 million people were affected by disasters every year<sup>77</sup>.

The Indian sub-continent has a history of **earthquakes**. India is one of the most earthquakes prone country's of the region with over 60% of the total area comes under moderate and high seismic zones. In the past 100 years various earthquakes from moderate to severe intensity has struck the Indian sub-continent<sup>78</sup>. According to the National Disaster Management Guidelines for Management of Earthquakes NDMA (2008) about 59% of total area of India is vulnerable to moderate or severe seismic hazard. The period 1990-2006 experienced six major earthquakes that have resulted in over 23,000 deaths and caused immense damage to property assets and infrastructure<sup>79</sup>.

The major earthquake in pre-independent India being the Nepal-Bihar Earthquake on 15<sup>th</sup> January, 1934, is considered as one of the worst earthquakes in history of India with epicenter located in eastern Nepal causing extreme damages to life and property with death toll of 30,000 people. Purnea, Munger, Muzaffarpur and Champaran of Bihar were worst affected districts<sup>80</sup>. The Assam earthquake of 15<sup>th</sup> August, 1950 caused widespread damages and destruction in both Assam and Tibet. It was considered among the 10<sup>th</sup> largest earthquake of the 20<sup>th</sup> century. The Uttarakashi earthquake of 20<sup>th</sup> October, 1991 took a toll of 1000 people that shook Uttarakashi, Chamoli and Tehrin Uttarakhand and caused extensive damage to property<sup>81</sup>

Another major earthquake disaster that struck India was at Killari Village in Latur in Maharashtra on 30<sup>th</sup> September, 1993. In the Latur Earthquake (1993) Latur and Osmanabad districts were worst affected. The destruction was so massive that over 52 villages were completely destroyed and flattened. The Gujarat, Bhuj earthquake of January 26, 2001 killed over 20,000 people, injured over 10,000 people, rendered 6 million people without any livelihood and impacted countless millions<sup>82</sup>. According to Status Report (2004) in the Bhuj

Earthquake (2001), more than 14,000 lives were lost, 10 lakh houses were damaged and assets worth Rs. 15,000 crore were damaged and lost.

The Indian Ocean Tsunami of December 26, 2004 is considered as the third deadliest earthquakes under sea in the history of the world that killed 15,000 people in India and generated killer waves against the 11 nations of Asia and Africa particularly hitting off west coast, northern Sumantra, India (including Andaman-Nicobar Islands), Sri Lanka, Maldives, Thailand, Malaysia, Indonesia and others. It also caused extensive damage to the ecology of the region particularly the 200 coral species in the reefs around Andaman and Nicobar were damaged. The Andaman Coral reefs are considered a treasure trove of biodiversity, second only to Australia's Great Barrier Reef<sup>83</sup>.

The Kashmir Earthquake of 2005 can be also considered as major earthquake that impacted India particularly Jammu and Kashmir that occurred on 8<sup>th</sup> October, 2005. The most recent earthquake, powerful in intensity hit India on 25<sup>th</sup> April, 2015 with its epicenter in East-South-East of Lamjung, Nepal. It was one of the strongest earthquakes that have hit Nepal in 81 years with tremors felt in north and east India. A total of 78 death reported in India<sup>84</sup> (including 58 in Bihar, 16 in Uttar Pradesh, 3 in West Bengal and 1 in Rajasthan).

**Landslides** in India are another recurrent disaster phenomenon. The three major areas that are vulnerable for landslides in India are the Himalayas, North-East India, the Western Ghats and Southern Plateau, Jammu & Kashmir, Uttarakhand, Himachal Pradesh, North East States and West Bengal (namely Darjeeling and Jalpaiguri districts) are the main states of India affected by landslides. Landslides prone areas largely correspond to earthquake prone areas, as a result the North-East and North West areas of India have highest incidence of landslides associated with

earthquakes) Landslides of major reckoning are September 1970 in Uttarakhand (death toll 223 and thousand houses collapsed), landslide of July 1975 in North Bengal killed many and rendered 4500 people homeless accompanied by floods. Landslide of 15<sup>th</sup> August, 1977 on Indo-Tibet border killed 44 persons with loss of property worth Rs. 2 million, landslide of July 23, 1983 in Karmi area of Bageswar district, Uttar Pradesh<sup>85</sup>.

The most recent devastating landslide and flash floods of Uttarakhand on 16<sup>th</sup> June, 2013 in Kedarnath region, killed 10,000 people, destroyed millions of houses and flattened the area<sup>86</sup>. The Uttarakhand disaster resulted due to cloud burst causing devastating floods and landslides becoming the country's worst natural disaster since the 2004 Tsunami. The figures provided by the Uttarakhand Government reported more than 5700 people presumed dead and more than 110,000 people evacuated from the affected area. Entire villages and settlements near Kedarnath were obliterated. Many believe that developmental policies and building dams upstream has impacted the fragile Himalayan ecosystem that resulted in a disaster<sup>87</sup>.

**Drought** is another recurrent disaster phenomenon in India that typically strikes the desert and semi-desert area of Rajasthan, Gujarat, Western Madhya Pradesh, South Western Uttar Pradesh, parts of Punjab and Haryana, North-Eastern Bihar, scattered pocket areas of the country covering about one lac sq. km area which includes (a) Kalahandi region of Orissa; (b) Purulia district of West Bengal; (c) Mirzapur Plateau; (d) Tirunelveli districts and parts of Tamil Nadu. Also Rajasthan and Kathchh (Gujarat) has been marked as Chronically Affected Drought Areas of India<sup>88</sup>. It is estimated that an area of about 10 lac sq. km. is affected by droughts due to inadequate rainfall which is below normal (variability of rainfall is 25-40% from normal). About 50 million people are affected annually by drought. Out of approximately (total) 90 million

hectares of rain-fed areas about 40 million hectares are prone to scant to no rainfall and policy failures leads to farmer suicide with Maharashtra (since 2001) recording highest farmers suicide<sup>89</sup>.

Droughts accompanied by famines were a recurrent feature in pre independent era. In the past droughts have periodically led to major Indian famines including the Bengal Famine of 1770 in which up to one-third of the population (10 million people) died in the affected area. The 1876-1877 famine in which over 5 million people died and the 1899 famine in which 4.5 million people died.<sup>122</sup> In the Orissa famine of 1865-66, ten lac people died, the Peninsular drought of 1876-77, 55 lac people died in Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu and in the Bengal Famine of 1943 it is estimated that 1.5 million people died<sup>90</sup>.

In independent India the worst drought year being 1965-66 in Maharashtra, Bihar during 1966-68 and the severest in 1996-97 in Kalahandi area of Orissa suffered extreme drought conditions. The drought of 1987 was considered as one of the worst droughts of the century that affected 60% of the crop and a population of 285 million. The most recent drought of 2002 ranks fifth in terms of magnitude but unique in terms of characteristics as rainfall deficiency dropped to 51% surpassing all previous droughts, threatening the livelihood of 300 million people across 18 states<sup>91</sup>.

To recover from the conditions of drought affected areas the Government of India has adopted the Drought Prone Area Programme which covers 745,914 km<sup>2</sup> in 972 blocks of 182 districts in the country. This is an integrated area of development programme for the agricultural sector that aims at optimum utilization of water, land and livestock resources, restoration of ecological balance and economic security of the people particularly weaker sections of the society<sup>92</sup>.

In this context H.P. Das points out that droughts in India are itself very critical to be included in the natural disaster category since drought may itself not appear to be a major cause of societal dislocation but it can combine with other underlying societal problems to initiate new development. The impact of drought lingers long after a drought has ended thereby disassociating the drought itself from many of its impacts on the socio-economic domain<sup>93</sup>.

The two major natural disasters that impact the country to an extreme level causing destruction, loss of lives and properties are **cyclones and floods** that occur regularly with varying frequency and intensity. **Cyclones and storm surges** appears to be the most recurrent feature with increasing intensity in Bay of Bengal (eastern coast) and Arabian Sea (western coast of India) causing immense damage to the environment and economic resources of the country, damaging crops, green-cover, coastal ecosystem, infrastructure, land degradation, soil erosion, increases soil salinity and highly impacts agricultural production<sup>94</sup>.

According to a recent study conducted by the Indian Meteorological Department, 12 districts on the east coast are ‘very highly prone’ and 41 ‘highly prone’ to cyclones in the country which is stretched within 13 coastal states and Union Territories. Particularly four states West Bengal, Andhra Pradesh, Orissa, Tamil Nadu and Uttar Pradesh, Pondicherry on the east coast and Gujarat on the west coast are more vulnerable to tropical cyclone. The study also focused on 96 districts out of which 72 touching the Indian coast and 24 are close to the coast<sup>95</sup>.

The Eastern Coast of India has a long history of devastating cyclones. The cyclone of 1970 (Bhola) that hit Bay of Bengal totally swamped low lying coastal regions of Bangladesh, India and Burma. An estimated 300,000 – 500,000 lost their lives. The worst cyclone that has hit India since 1990 was the “Great Super Cyclone Orissa of 29<sup>th</sup> October, 1999” left behind a trail of

devastation that has no parallel in the country with past records. More than 10,000 people died, 1.75 million hectares of kharif crop destroyed, one-third of the land remained submerged by saline water in Orissa and thousands of trees were uprooted. The cyclone affected districts lost 90% of their forest cover that led to the deterioration of coastal environment, increased salinity damaged agricultural productivity and heavy sediments affected the ecological environment of Chilka Lake<sup>96</sup>.

Cyclones have now become an annual affair for India. The most recent cyclones that hit India are – Cyclone Nisha (2008) over 180 people died in Tamil Nadu alone and damage of Rs. 3789 crores to the economy, Cyclone Phyan (2009) resulting in massive damage to property in coastal districts of Maharashtra, Cyclone Aila (2009) that hit the Khulna division of Bangladesh also hit West Bengal coast and killed 190 people, Cyclone Laila (2010) badly affected Andhra Pradesh and incurred a loss of Rs. 500 crore to the state exchequer. Cyclone Jaba (2010) which killed 54 people in coastal areas, affected the districts of Ganjam and Jagatsinghpur (Orissa) and over 70,000 people evacuated from the 4 coastal districts of Andhra Pradesh and 300,000 hectares of cropland devastated. Cyclone Thane (2011) that left 46 people dead and worst affected areas were Cuddalore (Tamil Nadu) and Pondicherry with severe damage to the economy<sup>97</sup>.

Cyclone Nilam (2012) that led to an economic loss of Rs. 100 crore and 3000 people evacuated around Mahabalipuram district and Chennai (Tamil Nadu). Cyclone Phailin (2013) is considered as one of the strong cyclone to affect India since the great super cyclone of Orissa (1999) causing massive destruction in the region (Orissa and Andhra Pradesh coastal areas), with 40 dead and affecting 12 million people, damaged crops worth crores and economic loss due to Phailin estimated to be around US \$ 696 million or Rs. 420 crore. It is also considered as India's biggest



evacuation in 23 years with more than 5,50,000 people moved to safer shelters in Andhra Pradesh and Orissa. Cyclone Hudhud (2014) that badly affected Orissa, Andaman & Nicobar Islands and particularly with landfall area of Vishakhapatnam (Andhra Pradesh) with at least 124 deaths and an estimated damage of Rs. 21,908 crore (US \$ 3.4 billion) by the state government<sup>98</sup>.

**Floods** can be considered as one of the major natural disaster that impacts India. According to the India Disasters Report 2011 floods are becoming annual feature. Recurring and regular in nature it has made the country vulnerable to food disasters. India is subjected to floods due to its geophysical location and other factors that make it susceptible to annual occurrences becoming severe during the season of monsoon (July-September).

In case of flooding in India annually it is estimated that 32 million people and thousands of livestock are affected and nearly 60% of the flood damage in the country occur from river floods and remaining 40% by flooding due to cyclones and heavy rainfall. In the Himalayan river basin about 66% of the damage is due to floods. The state of Uttar Pradesh accounts for (33%) of flood damages in the country followed by Bihar (27%) and Punjab. Haryana (15%) followed by Assam and West Bengal<sup>99</sup>.

India has witnessed some of the worst floods since independence the most extreme was the Bihar floods of 1997 (1399 people dead, 5302 animals lost lives and 68 million worth rupees damages of crops and properties), Gujarat floods 2005 (123 deaths, 250,000 people evacuated and loss of 8,000 crore rupees). Maharashtra Floods 2005 followed Gujarat floods of 2005 (1094 approx. people died with a major setback to the communication system in Mumbai and an estimated financial loss of Rs. 550 crore rupees and the devastating Kosi flood 2008<sup>100</sup>. The two most recent being the Uttarakhand flash floods 2013 that left 2,00,000 pilgrims stranded due to

destruction of roads, bridges and communication system and more than 5000 people presumed dead. This was also one of the greatest evacuation drives in Indian history of disaster relief and response when the Indian Air Force, the Indian Army and paramilitary troops evacuated more than 110,000 people from flood hit areas.

Most recently the Kashmir region suffered disastrous floods across many of its districts during the Jammu & Kashmir floods of 2014. According to the Ministry of Home Affairs, 2600 villages were reported to be affected in the Jammu & Kashmir floods out of which 390 villages were completely submerged<sup>101</sup>. The Chennai floods of 2015 reported thousands having been displaced with nearly 300 people reported to be dead in floods since heavy monsoon rains and reasons associated with urban development problems as well as climate change<sup>102</sup>.

In terms of economic loss and damages due to floods in the period from 1970-2000 the major floods that caused extreme devastation in India are the 1973 floods (damages estimated to 5000 million rupees), 1979 floods (5970 million rupees), in 1996 floods (22 billion rupees) was incurred in economic damages. Even the Indian Disaster Report 2011 (NIDM) reported that in recent times the high floods of 2001, 2003, 2006, 2008 (Kosi floods), 2011 (Odisha floods) has been considered as most catastrophic in terms of large scale destruction, loss of lives and economic damages<sup>103</sup>.

The analysis of the GBM river basin reveals that the region is an area representing trans boundary river system with a total area of 1.7 million sq. km. occupied by India (64%), China (18%), Nepal (9%), Bangladesh (7%) and Bhutan (3%) that is annually washed away by floods from June to September<sup>104</sup>. This region accounts for the worst floods affected region of the country accounting for sixty percent (60%) of floods in the country. The Indian states of Bihar,

West Bengal, Orissa and Assam face flood as a recurrent phenomena every year particularly the eastern and north-eastern are hit by worst floods cause by a number of factors both natural (heavy rainfall) and man-made such as deforestation in the Himalayan and plan region, excessive siltation of the river bed, human inference due to growing population, inadequate drainage capacity and natural denundation<sup>105</sup>.

Floods in India is a result of a complex interrelated factors such as excessive siltation of the river bed, lack of suitable drainage and huge inflow of water from upstream (Nepal) as India is a lower riparian country receiving huge amount of water downstream with heavy monsoon rainfall and also the rivers originating in the Himalayas flow downstream to feed the Ganges system of the lower flood plains impacting Uttar Pradesh, Bihar, West Bengal, Assam, Orissa. West Bengal and Orissa is also impacted by coastal storm surges and cyclone that inundates the low lying coastal areas giving rise to floods in these regions.

Associated with this is the critical problem of a large and growing population and poverty in the country. The pressure of population on national resources and fresh water availability has contributed to over dependence and over exploitation. The impact of these disasters are aggravated by the fact that still 27% of the population lives below the poverty line generation exposure to vulnerabilities and risks associated with settlements in low lying areas / vulnerable areas that indirectly impacts sustainable development<sup>106</sup>.

**Climate change** has added a new dimension to risks and vulnerabilities in India. It has emerged as a key environmental challenge that has become sharper in the last two decades. This is going to substantially have adverse effects mainly on agriculture on which 58% of the population is still dependent for livelihood, the melting of Himalayan glaciers, extreme rise in temperature and

sea level rise pose threats to a long coast line and habitation<sup>107</sup>. According to the Economic Survey of India Report (2012-2013) climate change can have adverse impact on India's water and food security<sup>108</sup>.

The Stern Report 2007 had already stated that the impact of climate change on poor countries is likely to be more severe through both the effects of extreme weather events and a longer term decline in the environment<sup>109</sup>. Even the World Development Report 2010 on climate change indicates that climate change has aggravated the risks for developing countries of South Asia including India with a large growing population and national economy depended on agriculture and natural resources are both sensitive to climate conditions<sup>110</sup>.

In this context it is pertinent to mention that the deltaic and coastal regions of India are vulnerable to risks of flooding (including two coastal cities of Kolkata and Mumbai). The Ganges-Brahmaputra river system and the region is also vulnerable to the effects of climate change due to melting of glaciers and loss of snow cover resulting in significant risk of flooding in the east and north eastern parts of India. Rising frequency of floods and droughts are likely to have serious effects on rural population and the poor due to climate change vulnerabilities<sup>111</sup>. The adverse challenges arising from climate change in future requires sound management of disaster risks and vulnerabilities and adaptation to climate change with focus on rural areas and poor population in India<sup>112</sup>

An exploration through data generated by the CRED-EM-DATA shows Disaster and Risk profile of India on a country basis. A detailed account for India shows top ten damage data of persons killed, affected and economic losses suffered by the country during the period of 1990-2015<sup>113</sup>. The CRED Database categorizes the various sub types of disasters and its impact which analysis

shows that greatest damaged both in terms of lives lost and economic damage in India is caused by floods, tropical cyclones followed by landslides, droughts and extreme temperature. A brief examination of all the data available in the last two decades reveals the fact that among all types of natural disasters flood and cyclone causes immense damage to economy and development and is one of the major threats to human security..

### ***Disaster and Vulnerability Interface in India***

Disaster involves the interaction of a disaster agent and a vulnerable population. Disaster occurs when vulnerable population comes in contact with extreme natural events, social phenomena and constraints and human vulnerability. Disasters are more pervasive where human population occupies vulnerable areas for settlement and occupation. Among the South Asian countries India is one of the most vulnerable to natural disasters due to high density of population, high incidence of poverty and vast coastline exposed to storm surges, cyclones and sea level rise due to climate change<sup>114</sup>.

In this context it is significant to mention that population plays a major factor in economic development of a country and can be at the same time highly impacted by disaster events. The population of a country and its socio-economic demographic profile acts as an asset as well as a liability in face of disasters that impacts the development and security of its people<sup>115</sup>.

The coastal areas of India and the Ganga delta plain has provided with favourable conditions for rapid population growth and also leading to the long standing concerns about population pressure that impacts economic development. India is a vast country but in terms of total land area use, growing populations a huge pressure on land and natural resources of the country.

India has been witness to population explosion in the last three decades. It was alarming during 1981-91 decade when India added 163 million people to its population putting extreme pressure on the country and development efforts carried by the state. According to the population census of India 2011, the total population was 121 billion which is equivalent to 17.5% of total world population with population density of 386 persons per sq. km<sup>2</sup> and 33% of the population residing in urban centres<sup>116</sup>. (See Table 5.6)

**Table 5.6: India Population (Growth) Census 1955–2015. Growth, % Change and Country's share in world population**

<i>Year</i>	<i>Total Population</i>	<i>Density (P/km 27)</i>	<i>Urban population %</i>	<i>Country's share of World Population</i>	<i>Fertility Rate</i>	<i>Global Rank</i>	
1955	408,973,604	124	18%	14.81%	5.90	2	
1965	497,952,332	151	19%	14.96%	5.82	2	
1975	622,232,355	189	21%	15.28%	5.26	2	
1985	781,736,502	238	24%	16.07%	4.47	2	
1995	955,804,355	291	27%	16.65%	3.67	2	
2005	1,127,143,548	343	29%	17.30%	3.00	2	
2015	1,282,390,303	390	33%	17.51%	2.50	2	

*Source: Ref: [www.worldmeters.info/worldpopulation/india-population.html](http://www.worldmeters.info/worldpopulation/india-population.html) Elaboration of data by United Nations Department of Economic and Social Division. UN Source India Population (2015) [Accessed on 26 May 2015, at 3.30 p.m.]*

The expanding population of India makes it a densely populated country with estimate of average density and urban population in the rise. This puts extreme on natural resources, land area use, migration and environment. Associated with this is the problem of natural calamities like floods and cyclones, regular and recurrent in nature that makes the country highly vulnerable to disaster. The above data indicates that India is an overpopulated country with high population pressure in relation to land availability.

Poverty to a large extent impacts the socio-economic level of development in the country. The incidence of poverty is further aggravated due to natural disaster events. Research studies have

pointed towards a co-relational link between floods and poverty in India especially in the state of Bihar which has history of floods<sup>117</sup>. Flood are major cause of persistent poverty especially strong in the short term in the immediate aftermath of major floods and has the potential to create “poverty traps” as evident in case of Bangladesh<sup>118</sup>. One of India’s most flood-prone state, Bihar with 76% of population in north Bihar lives under the threat of recurring flood devastation. During the last 30 years Bihar has recorded the highest number of floods. These floods being frequent cause extreme damages and can be ruinous as noticed in the floods of 1987, 1998, 2001, 2004, 2007, 2008 and floods in the following years to come<sup>119</sup>.

According to India Census 2011 nearly forty-eight percent (48%) of the total population from coastal areas is currently living in urban centres and more than fifty percent (50%) of towns and villages are situated in the coastal regions of India. About one third of India’s population live in coastal areas and the density of the population are increasing at an alarming rate. Climate change is expected to increase the frequency and intensity of disaster events with the low lying densely populated coastal areas already exposed to frequent occurrences of cyclones, storm surges and environmental degradation increasing the vulnerability of coastal ecosystems<sup>120</sup>.

The phenomena of climate change related sea – level rise has also increased the vulnerability of coastal ecosystems in India particularly the coastal cities, coastal population and urban centres in the coastal regions are badly impacted<sup>121</sup>. Research related study shows that for the first time a study has been undertaken for a part of Indian coastline in Coastal Vulnerability Assessment for Orissa State, East Coast of India (2010) by research scientist form Indian National Centre for Ocean Information Services to highlight the risk and vulnerability map of coastal area of India<sup>122</sup>.

The problem of urbanization and urban poor has also increased the disaster risk and India is considered as one of the high risk countries in the world in relation to natural disasters. Research studies have tried to relate the coastal vulnerability of metropolitan cities and urbanization that increase disaster risks. There is co-relational tendency where majority of the people are at risk due to disasters in coastal areas determined more by complex processes of urban development and governance<sup>123</sup>. Out of the four metropolitan cities Mumbai, Kolkata and Chennai are located on the west and eastern coast of India with a large share of population residing in coast lines due to socio-economic reasons of livelihood and occupation. As per the Census of India 2011, the total population living in these three cities are 2,16,46,231 people with high density in terms of settlement<sup>124</sup>. This in turn will have tremendous impact on socio-economic conditions and livelihood of local communities.

The United Nations Habitat Report 2007 points out that urban growth and disaster risks are statistically correlated. The urban centres with high population density are likely to be at high risk of mortality and number of persons affected by any disaster events will eventually increase the economic loss and damages. The United Nations Habitat Report (2007) further indicates that countries having high HDI (Human Development Index) ratio face low mortality risk in contrast to countries with low HDI ratio. This increases the potentials to disaster risks and in totality the impact is much higher in urban centres compared to rural areas in developing countries<sup>125</sup>.

The World Disasters Report 2010 with focus on urban risk projects a similar trend that the United Nations Population Division has suggested that almost all the world's population growth in the next few decades will be in urban areas in low and middle income nations. The Report indicates that for the first time over half the world's population is living in urban centres and



more than 1 billion people are living in appalling conditions in urban areas which is growing rapidly<sup>126</sup>. India being one of developing countries in the Asian region is experiencing rapid urbanization that aggravates the vulnerability scenario. The UN data estimates India on the “brink of an urban revolution with its urban population expected to reach 600 million by 2030 reported by the New Climate Economy Report of the Global Commission on the Economy and Climate (17<sup>th</sup> September, 2014)<sup>127</sup>. There is thus a co-relational linkage between urbanization and rising incidence of risks and vulnerability to disasters.

The links between urban poverty and disaster risks are closely intertwined and is likely to increase due to climate change. The percentage of Indian population living in urban areas has increased from 27.8 percent in 2001 to 31.16 percent in 2011 contributing about 7% of the GDP<sup>128</sup>. The highest densities of the population are located in metropolitan cities like Mumbai, Chennai, Kolkata and Bangalore and governing mega-cities has become more challenging in the coming decades<sup>129</sup>. Migration to urban centres has resulted in the settlement of poor people in sub-standard housing infrastructure with low civic amenities leading to the creation of slums which was more rapid in the latter half of the 20<sup>th</sup> century particularly in the developing countries<sup>130</sup>. According to the United Nations Habitat Report 2007, Asia accounts for the largest share of the world’s slum population (in 2005) with 581 million people, the region is home to more than half of the world’s total slum population. Southern Asia has the highest record of slum dwellers about 63% or almost 170 million reside in India<sup>131</sup>.

These urban areas are emerging as major centres of disaster risk with unplanned urbanization and unregulated growth disaster risk in these cities is likely to increase the vulnerability of the poor to disasters. The Mumbai Flood of 2005 and most recently the Chennai Flood of 2015 had

exposed the vulnerability of the people residing in urban centres and brought out the lack of preparedness capacity to deal with it. The problem of urban planning and challenges requires stronger roles from the administration both at the national and sub national level<sup>132</sup>.

With urban development that is unable to meet the rising demands, the vulnerability of people and infrastructure in urban centres results in a greater degree of risks to natural disasters and affects of climate change. The Government of India's Twelfth Five Year Plan (2012-2017) has estimated that US\$ 1 trillion would be required to bridge the infrastructural over the next two decades<sup>133</sup>. This suggests that the poor both in the rural and the urban centres are more exposed to and highly vulnerable to natural calamities as reduction of poverty has been slow in the developing countries as is the case with India.

Given the above scenario it becomes pertinent to understand the policy matrix framed to reduce disaster risks and vulnerabilities towards disasters and also to understand the linkages between natural disaster policy, level of preparedness and its management in the Indian content. It is also an attempt to understand the development process to make it more sensitive to disaster prevention and sustainable that will secure the lives of the people in relation to the state.

### ***Natural Disaster Policy and Framework in India***

To understand and mitigate the question of human insecurity arising out of natural disaster scenario in India it is pertinent to explore and examine the disaster management policy perspective. This also brings into focus the issue of disaster management and development in context of India. The economic losses that the country has been suffering from disasters in the recent past require the development process to be sensitive towards disaster prevention and

mitigation. It also places a heavy burden on the people, community and society as a whole. Viewed from this perspective it is quiet clear that disaster are all encompassing and as such addressing of policies and mechanism to deal with the management of disasters must be all pervasive and holistic in nature.

The exposure and experience from the past mega disaster has brought disaster management to the forefront of India's development agenda<sup>134</sup>. India has been actively pursuing a gradual and consistent shift in disaster management from a conventional relief centre approach in the past to a more holistic and encompassing approach to disaster management. The framework is being developed through the Five Years Plans, Annual Development Plans and other Plans and policies to create an effective regime of disaster management. India since independence till now has generated 12 Five Year Plans (1951 - 2017). The earlier five year from 1<sup>st</sup> Plan till the 9<sup>th</sup> Plan did not mention disaster management though provision for "calamity relief" was always embedded from the pre independence era coming down as colonial legacy adopted and amended by independent India

Analyzing the evolution of disaster management framework of India brings out very clearly that disaster management was not included in the plan documents till the making of the Tenth Plan (2002-2007)<sup>135</sup>. It was addressed on an adhoc basis. The systematic response started from the 1990s when the United Nations declared the Decade as the International Decade for Natural Disaster Reduction followed by the first world conference on disaster risk reduction and mechanism response came in the form of Yokohama Strategy and "Plan of Action for a Safer World" 1994.

India responded following the UN declaration and a permanent disaster management cell was established under the Ministry of Agriculture in 1993. In August 1999, a High Powered Committee (HPC) was instituted to review the existing mechanism for disaster preparedness and mitigation and measures to strengthen these mechanisms at the national, state and district level. The Committee set up under the Chairmanship of J. C. Pant examined the issues of disasters holistically considering both natural and man-made disasters. In the report strong emphasis was laid on the preparedness and on the role of different stakeholders. The report was submitted in 2002 along with a National response Plan to be worked upon to mitigate disaster issues<sup>136</sup>.

Following the devastating Gujarat Earthquake of 26<sup>th</sup> January, 2001 in Kutch, Bhuj district two important developments took place. Firstly after the Gujarat earthquake (2001) an all party National Committee on Disaster Management was set up under the Chairmanship of Prime Minister. The Central Cabinet was empowered to set up a Committee in the wake of a disaster and the Secretary of Agriculture was responsible effective implementable of the Committee's recommendations. The Department of Agriculture and Cooperation (DAC) acted as the nodal agency and the Relief Commissioner of the DAC was the nodal officer for the Disaster Management. In 2002, the Disaster Management Division of Ministry of Agriculture was shifted to Ministry of Home Affairs (MHA)<sup>137</sup>.

Secondly after the Gujarat Earthquake of 2001 that caused devastating damages of 13805 persons dead, injury to 1,67,000 persons and over a million homes were damaged or destroyed, the state of Gujarat was the second state in India to respond with a Gujarat State Disaster Management Authority 2003 (GSDMA) a successor to Orissa State Disaster Mitigation Authority that was formed in the after month of Orissa Super Cyclone of 1999<sup>138</sup>.

The formation of GSDMA was epoch making in several ways as it (a) led to the most comprehensive reconstruction and recovery programme and its successful implementation (b) it also focused on medium and long term aspects of disaster risk reduction (c) it catalyzed the actions to be taken to bring far reaching changes in the institutional structure of Disaster Management Framework in India. Finally it also led to the constitution Gujarat State Disaster Management Act of 2003 under Sec. 7 of the GSDM Act of 2003 that mandated the formation of GSDMA that created a new institutional structure in Disaster Management<sup>139</sup>. Later it acted as a precursor to the new organizational structure created for disaster management in India

In 2004, the Government of India came out with a Status Report on disaster management that laid the foundation for a more comprehensive and holistic approach towards disaster management in India. It created a framework and a road map for working upon concrete legislations to be formulated for disaster management in India<sup>140</sup>. This development culminated in the enactment of Disaster Management Act 2005 that provided legal – institutional set up for the Management of disasters with proper organization set up complimenting the new legal institutional system of disaster management in India<sup>141</sup>.

An analysis of the Five Year Plans since 1951 reveals that Five Year Plan documents have historically not included consideration of issues relating to the management and mitigation of disasters. The traditional perception has been limited to the idea of “calamity – relief” which is seen essentially as non-plan expenditure. It was only in the Tenth Five Year Plan (2002 – 2007) that disaster management was mainstreamed in the planning process and a separate chapter on Disaster Management was included in it.

The Tenth Five Year Plan (2002-2007) for the first time had a detailed separate chapter entitled “Disaster management: The Development Perspective” to address this issue from a comprehensive approach the Plan emphasized for the first time that development cannot be sustainable without mitigation being built into the development process and disaster mitigation and prevention were adopted as essential components of development strategy<sup>142</sup>.

The **Disaster Management framework in India constitutes of two components: the structural and non structural components of mitigation.** The structural components of mitigation involves physical construction of safe shelters and to reduce the possible impacts of hazards by building of dams, floor levies, embankments evacuation shelters, flood and cyclone shelters and earth resistant shelters. Various stakeholders including the NGOs in collaboration with the state at times proceed for safe shelters both temporary and permanent to help people who are dislocated by disasters for shelter<sup>143</sup>.

India and other non-governmental organizations (NGOs) have repeatedly responded with the provision of both short term emergency shelter and construction of permanent structures in collaboration with peer NGOs or agencies and at times in partnership with Government (e.g. Tsunami response in Tamil Nadu in 2004 and with armed forces to the Jammu & Kashmir earthquake in 2005)<sup>144</sup>. A recent study conducted by CARE India on post disaster shelters between the period covering 2001 – 2015 brings out the response in the last fifteen years that covers ten states of India approached for building of post- disaster shelters in India<sup>145</sup>.

Following the Super Cyclone of 1999 the Government of India and the National Disaster Management Authority has come up with cyclone shelters along the coasts of Odisha and

Andhra Pradesh. The Government claims it is better prepared to deal with cyclones now after cyclone Phailin 2013 than it was a decade earlier<sup>146</sup>.

Odhisa has around 203 cyclone shelters to with stand speed upto 300 km per hour and moderate earthquakes at every five km whereas Andhra has built cyclone shelters separated by 1 km distance. These Cyclone shelters are managed by the NGOs (Indian Red Cross Society India) and Community based Cyclone Shelter Management and Maintenance Committees (CSMMC) mostly in Odhisa<sup>147</sup>. Flood Resistant Shelter Project launched in 2008 in India is being carried on by NGOs who have helped villages build 157 flood resistant shelters in four communities in Orissa and West Bengal<sup>148</sup>.

The non structural component of disaster mitigation involves preparing plans and policies, building legal instruments and mechanism creating and strengthening institutional arrangements involving knowledge and practices imparting training creating public awareness and related activities to reduce disaster risk and vulnerabilities of the people.

**The non – structural components of disaster mitigation in India involves (I) the regulatory framework and (II) the institutional framework.** The regulatory framework includes the preparation of national plans, policies and mechanism to in mainstream disaster risk reduction in national planning and development and the institutional framework includes the administrative and organizational part of the disaster framework.

An in-depth analysis of the Regulatory framework of disaster management in India brings out two components (a) Legal framework of Disaster Management (b) National Plans, Policies and

Mechanism to address Disaster Risk Reduction. These two components are briefly addressed below.

### ***(I) Regulatory Framework of Disaster Management***

#### ***(a) Legal Framework of Disaster Management in India:-***

The development of legal framework for disaster risk reduction and emergency response in India involves a complete detailed framework that had been generated consistently through decades to regulate and guide activities associated with disaster management though not pronounced prominently in plan documents. Since independence India did not had a structured policy on disasters though various colonial legacies were carried forward to meet the emergencies. The Five Year Plans since independence starting from 1951 did not specifically mention the term “Disaster Management” but adopted various measures to combat environmental hazards like droughts and famines. Consistent and gradual legal framework developed since the 10<sup>th</sup> Plan onwards. These are briefly discussed below:

##### ***i.) Famine Codes (1880s Onwards)***

The first codification to provide “ad hoc relief” to the people in times of calamities such as famines was the first response of the pre independent (British) India. Following the great Famine of 1876-78, the First famine Commission was appointed in 1878 that resulted in the first Famine Code of 1880. The Famine Code was adopted as a National Policy to be applicable in different regions of British India. The instructions included in the Commission Report meant to anticipate families to save lives at the lowest possible cost to the exchequer providing employment at subsistence age and relief in the nature of “gratitude to the unemployable”<sup>149</sup>. The Famine Codes



for the first time provided institutionalized guidelines to colonial rulers which also highlighted the exploitative and inhuman nature of British administration in India. The policies on famines was variously updated and continued in independent India. The codes have been renamed Scarcity Manuals that reflects the shadows of colonial administration in India's policy formulation even after six decades of independence in responding to food scarcity<sup>150</sup>

### ***ii.) Civil Defense Act 1968***

The Civil Defense Act enacted by Parliament in the nineteenth year of the Republic in 1968 made provisions for civil defense and matters connected herewith. The Act includes life, property and place or anything in India to be protected. To some extent this Act covers some provisions of personal injuries and damages due to any untoward incident<sup>151</sup>. Article 2 Section (a) of the Act covers "civil defense" which includes any measure not amounting to actual combat for affording protection to any person, property, combat for affording protection to any person, property, place or thing in India. It also covers under Article [2(E)] personal service injury under the Personal Injuries (Emergency Provision Act, 1962). The Central Government can make rules for civil defense in various matters mention in Article 3 (Sec 1a – 1z and sec 2 and Sec 3) with particular reference can be made to Article 3 Sec. I sub section f (3 (i) (f) regarding protection of life and property by taking fire precautions and other measures<sup>152</sup>. This act could be invoked during fire and other emergencies.

### ***iii.) Civil Defense Rules , 1968***

To exercise the powers conferred by sub section (3) of the Sect I of the Civil Defense Act 1968 (27 of 1968) the Central Government has made the rules called the Civil Defense Rules, 1968

for securing the life, property, place or anything within the territory of India which mention in sub section (3) (i) to (iv) measures for dealing with outbreak of fire. These earlier provisions of codified instructions to the central and state administration to a small extent covered subtly the matters of personal life, property and security of the place within India's territoriality<sup>153</sup>.

### ***Civil Defense and Disaster Management***

The concept of Civil Defense as mentioned in the Civil Defense Act, 1968 has shifted from management of damage against "threat" perception towards management of natural disasters. Based on the recommendation of Group of Ministers, the Ministry of Home Affairs evolved an Action Plan in consultation with State Governments (2<sup>nd</sup> April, 2008) to amend the Civil Defense Act, 1968 to cater to the needs of disaster management and utilize the services of Civil Defense Volunteers for effective public participation in disaster management related activities<sup>154</sup>. According to the Ministry of Home Affairs, Government of India, Annual Report 2009-2010, during the 11<sup>th</sup> Five Year Plan Rs. 100 crores has been allotted for revamping civil defense set up in the country. In the financial year 2009 Rs. 15 crore was disbursed to state for various schemes under civil defense setup. The Civil Defense (Amendment Bill 2009) was passed by the Parliament in December, 2009 to give a statutory backup to the Civil Defense Organizations associated with the work of disaster management in the country<sup>155</sup>.

### ***iv.) Disaster Management Act, 2005***

The Disaster Management Act, 2005 was enacted by the Parliament of India in the fifty-sixth year of the Republic received the assent of the President on 23<sup>rd</sup> December, 2005 and to be published in the Statute Book on 26<sup>th</sup> December, 2005 by a Gazette Notification. The Disaster

Management Act, 2005 has 11 Chapters and 79 Sections. The Act extends to whole of India and provides for “the effective management of disasters and for matters connected therewith or incidental thereto”<sup>156</sup>. The Act creates the legal-institutional framework that would guide the future disaster management system for whole of India. An analysis of the Act shows that various adhoc measures to combat calamities so far was further consolidated and codified under the Act that laid a solid legal foundation in mainstreaming disaster risk reduction national plans and policies as well as in all the institutional arrangements associated in the field of disaster management. The Act was enacted exactly on the first anniversary of the devastating Tsunami (December 26, 2004). An analysis of the Act summarizes in brief the objectives that guide disaster management activities as follows:-

- a. To develop and affective disaster management framework In India
- b. To establish a legal institutional framework of disaster management.
- c. To establish risk reduction as a core element of disaster management
- d. To effectively respond and recover from emergency situations.
- e. To prepare the communities for managing the efforts of a disaster event.
- f. To help develop plans and programs to mitigate the potential adverse affects of hazardous events.

The Disaster Management Act, 2005 consolidated all earlier efforts and activities based on a reactive approach which was functional only in post disaster scenario with a hierarchical–institutional structure for disaster preparedness and risk reduction in the India. This Act provides for systematization of disaster policies and mechanism as well as legal- institutional instruments to guide disaster related activities. Following the implementation of the Act the institutional

structure of disaster management in India is in a state of transition, evolving each day with passage of time, while all previous structural arrangement continues<sup>157</sup>

An analysis of the Disaster Management Act brings out the nature and working of disaster management structure. At present the structure exhibits two distinct features, firstly the structure is hierarchical and functions hierarchically starting from the centre, state, district and local levels. Post implementation of the Act various institutional structures at the centre, state and local levels have been institutionalized within the legal framework. Secondly the structure is a multi stake holder set up that draws the involvement of various relevant ministries, government departments, administrative bodies, civil groups and NGOs working in the field of disaster related activities.

At times it has to face difficulties of non-communication and cooperation among various departments of the government<sup>158</sup>. While describing the nature of the Act Max Martin points out the hierarchical, bureaucratic, command and control as well as top-down approach of the Act gives the administrative authorities at the central, state and district level sweeping powers and an ornamental role for the elected local representatives and local communities<sup>159</sup>.

***(b) National Plans, Policies and Mechanisms to Address Disaster Management in India***

In terms of policy response India has been specifically working in the direction of disasters risk reduction and emergency response mechanism. To address this propose specific plans and policies have been framed that outlines the basic goals, conceptual framework and disaster management vision of the country. At the same time recognizing the adverse impacts of climate change on India's ecosystem and natural resources, policy frameworks have been addressed to

mitigate disasters impacts. The following examination brings out in detail the various plans and policies adopted for disaster risk reduction in India.

**i) *National Policy on Disaster Management (2009)***

The National Policy on Disaster Management (2009) (NPDM) in pursuance with Disaster Management Act 2005 was approved in November 2009 to lay down a comprehensive policy document on holistic management of disasters in the country. The vision of the National Policy is to build a safe and disaster resilient India by “developing a holistic, proactive, integrated, multi disaster oriented and technology driven strategy” to promote a culture of prevention mitigation, preparedness and response. The vision that this policy seeks to achieve are<sup>160</sup>

- a. To promote a culture of prevention, preparedness and resistance at all levels through knowledge, innovation and education.
- b. To encourage mitigation measures based on environmental sustainability.
- c. To mainstream disaster management into development planning process at all levels of governmental organization.
- d. To establish institutional and technological frameworks to create a regulatory environment and a compliance system.
- e. To ensure effective mechanism for identification assessment and monitoring of disasters risks.
- f. To develop and build Hi-tech forecasting and early warning systems with safe communication and information technology.
- g. To ensure effective response and relief of the vulnerable sections impacted by disasters

- h. To undertake reconstruction of safe and resilient structures to ensure safe living.
- i. To ensure adequate budgeting for disaster management activities at all levels including ministries and departments at central and state level.

An analysis of the NPDM (2009) brings out a holistic and integrated approach towards disaster management with emphasis on building strategic partnership at various levels. The themes underlying the policy includes community based disaster management, involvement of community based organizations, the panchayati raj institutions, local bodies and civil society. It also involves capacity building in all spheres, consolidation of past initiatives and best practices working at national level and international level with multi-sectoral approach towards disaster management<sup>161</sup>. Most of the states in India are in the process of constituting the State Policy on Disaster Management.

As an ongoing process, currently the states of Madhya Pradesh, Gujarat and Kerala have formulated State Disaster Management Policy (SDMP). Tamil Nadu, Chattisgarh, Uttaranchal, Meghalaya, Bihar, Rajasthan, Delhi, Orissa and West Bengal have prepared Draft policy to integrate and mainstream Disaster Management in developmental planning process. Many states of India have codes and manuals for management of disasters (floods, droughts). At present most of the states are in the process of changing their State Relief Codes and Disaster Management Manuals<sup>162</sup>.

### ***Mainstreaming Climate change in Policy Framework***

Mainstreaming climate change for disaster risk reduction is one of the major policy initiatives into development planning in India. In recent times climate change has emerged as a major threat

and vulnerability factor for the country<sup>163</sup>. In terms of policy response the issue of climate change was first incorporated as environment and development issue in the National Environmental Policy 2006 that acknowledged large scale investments would be required for adaption measures to avoid negative impacts of environmental degradation on India's future and to facilitate realization of sustainable development by main streaming environments concerns and climate change comes in all development activities<sup>164</sup>.

***i) National Action Plan on Climate Change 2008***

The major policy initiative that highlighted the challenges posed by climate change required risk management strategy to be prioritized, adaptation, mitigation, technology transfer, reduction of carbon commission, mobilization of finances and pro –poor mitigation policies led to the adoption of National Action Plan on Climate Change 2008<sup>165</sup>.

India has initiated a number of policies to address the issue of climate change. In June, 2008 India's first National Action Plan on Climate Change (NAPCC) document identified eight core “National Missions” to climate change mitigation running through the current plan period of 2012-2017. The focus of the NAPCC is to address Green House Gas (GHG) mitigation, enhanced energy efficiency, solar mission, sustainable habitat, sustainable agriculture, strategic knowledge for climate change , sustaining Himalayan ecosystem, Nation Water Mission , Green India Mission and related projects and initiatives to deal with the threat of climate change<sup>166</sup>.

All these missions set the guidelines to develop a comprehensive plan of action to be taken up by respective ministries and state governments. The State Action Plans on climate change is geared towards creating institutional capacities and implementing sectoral activities to address climate

change consistent with the strategy outlined in NAPCC. Currently twenty eight states are geared towards developing one of the largest sub-national action plans in the world and started the process of decentralized planning for climate change. The process however lacks innovative approaches and slow in implementation in most of the states<sup>167</sup>.

### ***ii) National Policy on Disaster Management and Climate Change 2009***

The process of integrating climate change and disaster management in India finds resonance in the National Policy on Disaster Management 2009 that highlighted the impact of climate change related natural disasters (cyclone flood and droughts in coming years) to meet these challenges a more sustain and effective approach and strategies are required to be deal with climate change adaptation and disaster risk reduction. The integration of climate change and disaster management requires translating diverse institutional structures and district level planning and policy framework into concrete projects to meet the new challenges<sup>168</sup>.

### ***iii) Twelfth Five Year Plan and Climate Change Action Programme (CCAP)***

The Planning Commission of India has recognized climate change as a major area of environmental intervention. Under the current Twelfth Five Year Plan (2012-2017) the goal is to reduce GHG emission, increase renewable emergency capacity and increase in GDP.<sup>265</sup> Climate change Action Programme (2014) with a budget of Rs 290 crores a new umbrella scheme has been approved by the Planning Commission for implementation during the 12<sup>th</sup> Financial Year Plan<sup>169</sup>. The schemes at advancing scientific research, information and assessment on climate change and building upon domestic policies to address climate change through scientific programmes and actions starts at the national and state level and includes mitigation strategy



contributing in the renewable energy sector and other missions with a total allocation of Rs. 36,625 crore (US \$ 6 billion) <sup>170</sup>. Moreover under the 12<sup>th</sup> Plan the Government of India has a domestic mitigation goal of reducing emissions intensity of GDP 20-25 % by 2020 in comparison with 2005 level<sup>171</sup>.

### ***Institutional Mechanisms for Mainstreaming Climate Change***

**i) The Ministry of Environmental and Forest (MoEF)** is the nodal ministry for all climate related activities and issues in the country. The issues related to environment received direct attention and allocation for the first time starting from the 4<sup>th</sup> Plan Period (1969-1974) and a Committee on Environmental set up to deal with the matter. A full fledged Department of Environment was set up in 1980 that was upgraded to a full fledged Ministry of Land and Forest in 1985. The Ministry was further upgraded and recast as Ministry of Environment and Forest and Climate Change in January 2014<sup>172</sup>. The Ministry of Environmental and Forest and Climate Change is responsible for planning, coordinating and implementation of environmental forestry policies and programmes as well as climate related activities in the country.

The Ministry also serves as the nodal agency coordinating (a) multilateral organizations such as Commission on Sustainable Development (CSD), Global Environment Facility (GEF) , implementation of Clean Development Mechanism (CDM) on climate emissions, United Nations Environment Programme (UNEP), United Nations Conference on Environment and Development (UNCED), International Centre for Integrated Mountain Development (ICIMOD) and (b) Regional bodies such as South Asia Cooperative Environment (SACEP), Economic and Social Council for Asia and the Pacific (ESCAP) and South Asian Association for Regional Cooperation (SAARC) on matters relating to environmental and climate change<sup>173</sup>.

**ii) The Prime Minister's Council on climate change** is another mechanism to mainstream climate related issues in plans and policies. The Prime Minister's Council on climate changes formed on June 5 ,2007<sup>267</sup> was reconstituted in January, 2014 with new advisory team to launch new initiatives to scale up clean energy mechanism, coastal zone management and present India's stance in international climate negotiation. The reconstituted council's work includes coordinating response to climate change issues at the national level, formation of action plan, assessment adoption and mitigation of climate change and periodic monitor of key policy decisions. The Ministry of Environmental and Forest and climate change will assist the PMO in facilitating the work of Council<sup>174</sup>.

## ***(II) Institutional Framework of Disaster Management***

The present disaster management system in India represents a hierarchical structure in accordance with the federal set up of the country from the national to the local level and each level being elaborating departmentalized to provide policy guidance towards disaster reduction and emergency response mechanism in India. The institutional framework of disaster management in India involves national level and sub national level institutions associated with disaster management. With the formulation of the Disaster Management Act, 2005, the Government of India began a concrete effort to build the institutional capacity for disaster management for the whole of India supplementing the existing administrative arrangements. This led to the establishment of a specialized permanent body to implement various projects, plans and policies undertaken by the government for disaster management.

The effort resulted in the establishment of the National Disaster Management Authority (NDMA) at the national level initially constituted on May 30, 2005 prior to the Disaster

Management Act, 2005 under the Chairmanship of Prime Minister vide an executive order. With the enactment of the Disaster Management Act 2005, the NDMA was formally constituted in accordance with Sec 3(1) of the Act on 27<sup>th</sup> September, 2006 with Prime Minister as the Chairperson and nine other members with one such member designated as Vice Chairman<sup>175</sup>. The NDMA has been mandated with laying down policies on disaster management and guidelines to be followed by different ministries, departments of government of India and State Governments in taking measures for disaster risk reduction. A National Executive Committee is constituted under Sec 8 of the Disaster Management Act, 2005 to assist the NDMA in performance of its functions<sup>176</sup>.

The Disaster Management Act also envisages specific roles to be played by the local bodies in Disaster Management. Based on the 43<sup>rd</sup> and 74<sup>th</sup> Amendment Act these local bodies can act as effective instruments in taking disasters through early warning systems, reliefs, distributions, providing shelter to victims, medical assistance and implement future rehabilitation programmes<sup>177</sup>. The institutional framework for disaster management in India can be broadly classified at two levels – (i) National Level Institutions and (ii) Sub-National Level institutions interrelated to each other with clearly spelt out functions and duties within legal jurisdiction to discharge their roles and responsibilities as outlined in detail in the Disaster Management Act, 2005

#### ***i.) National Level Institutions***

The national level institutions are responsible for policy formulation, coordination of relief and response and implementation of overall natural disaster management plans and policies at the national level. According to the provisions of the Act [Sec 3(1)] a National Disaster Management

Authority (NDMA) headed by the Prime Minister as Vice Chairman and eight other Members. The NDMA is responsible for laying down policies, plans and guidelines for coordinating the implementation of Disaster Management in the country. The NDMA is assisted by the National Executive Council (NEC) according to Sec 8 of Disaster Management Act, 2005 headed by the Union Home Secretary in charge of major departments at the National level too is responsible for implementing the plans and policies of NDMA<sup>178</sup>.

***ii.) Sub- National Level Institutions***

At the State level, according to the provisions of the Act, 2005 [Sec 14 (1) of Chapter II of the Act] the State Disaster Management Authority (SDMA) headed by the Chief Minister of every state is responsible for laying down policies and plans for Disaster Management in the state in accordance with the guidelines laid down by NDMA<sup>179</sup>. The SDMA is assisted by the State Executive Committee (Sec 20 of Disaster Management Act, 2005) headed by Chief Secretary of the State Government with four other Secretaries as the State Government may deem fit. It is responsible (Sec 22 of the Act, 2005) for coordinating and monitoring the implementation of national policy, plan and state plan for disaster management<sup>180</sup>.

At the District Level (Sec 25 of DM Act, 2005) the Act provides for constitution of District Disaster Management Authority (DDMA) for every district of a state to act as the planning, coordinating and implementing body for Disaster Management at the district level according to the guidelines of NDMA in SDMA. According to Section 25 of the Act, 2005, the District Magistrate or Deputy Commissioner of the district is the Chairperson of the DDMA. The elected member of the area is the member of the DDMA as an Ex. – Officio Co-Chairman of the DDMA. The task of the DDMA is to coordinate relief and rehabilitation as well as ensure that all

departments act according to the State Disaster Management Policy as prescribed by the State concern<sup>181</sup>. The Government has also accepted the recommendations of the 2<sup>nd</sup> Administrative Reform Commissions to develop institutional framework for large (metropolitan with population exceeding 2.5 million) cities headed by Mayor, assisted by Commissioner of Municipal Corporation and Police Commissioner to be directly responsible for Crisis Management<sup>182</sup>.

The local level agencies like the village Panchayats and Municipalities are the first set of organizations involved in relief and rescue operation. The 73<sup>rd</sup> and 74<sup>th</sup> Amendment Act to the Indian Constitution established the Panchayati Raj institutions as the “institutions of self government”. These local bodies provide effective local administrative agencies in tackling disasters through early warning systems, relief distribution, providing shelter to the victims, medical assistance, to oversee relief and rescue operation. The local bodies are to be actively associated with disaster management working closely for the vulnerable communities. All projects undertaken for providing safe shelter by local authorities must conform to the standards and specifications required for disaster mitigation and prevention<sup>183</sup>.

### ***National Level Institutional Mechanism to Address Disaster Management***

#### **(1) National Disaster Response Force (NDRF)**

The Disaster Management Act, 2005 under Section 44-45 provides for constituting a NDRF “for the purpose of specialist response to a threatening disaster situation or disasters under a Director General appointed by the Central Government. The NDRF has been set up comprising of 144 specialized teams on various types of disasters coming from the Armed forces. This civil defense has been strengthened to respond effectively to disasters<sup>184</sup>.

## **(2) National Institute of Disaster Management (NIDM)**

The Disaster Management Act, 2005 under Section 42 of the Act calls for the establishment of a National Institute of Disaster Management (NIDM) for training, capacity building, research and documentation on various natural and man-made disasters. It has also mandated the NIDM to work on the following issues<sup>185</sup>:

- To develop comprehensive human resource plan for disaster management
- To be included in the curriculum of school education as well as in course curriculum for engineering, architecture and medical degrees.
- To accommodate building byelaws for town and country planning legislations, land use-zonation and development control legislations. To address this issue the National Building Code has been revised to take into consideration the natural hazards and risks of various regions of the country. Bureau of Indian Standards (BIS) is the institutional mechanism to issue building codes for constructions in different seismic zones of the country.

## **(3) National Disaster Response Fund (NDRF) and State Disaster Response Fund (SDRF)**

The Ministry of Home Affairs is the nodal agency / ministry for providing financial assistance in the aftermath of any disaster. The Disaster Management Act 2005 constituted the NDRF and SDRF and also later to constitute NDMF (National Disaster Mitigation Fund) and SD MF (State Disaster Mitigation Fund). The NDRF and SDRF constituted under the Disaster Management

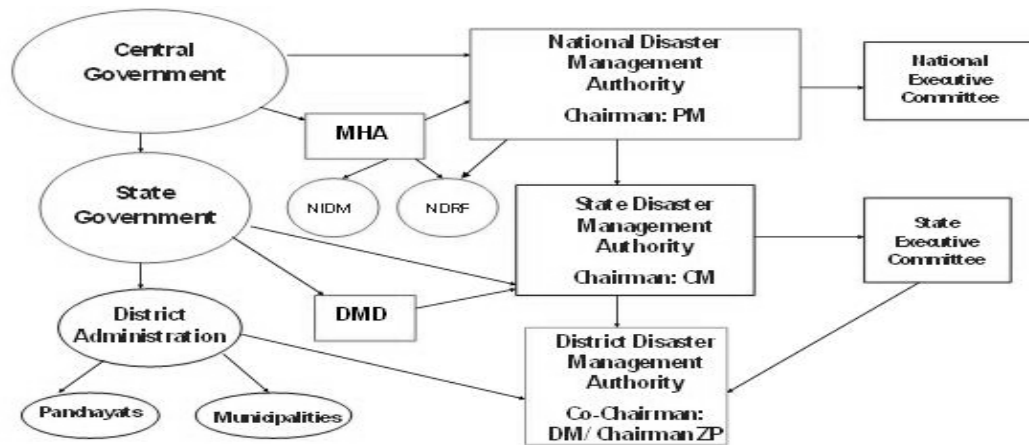
Act was made operational based on the recommendations of the 13<sup>th</sup> Finance Commission. The schemes of the NDRF and SDRF were made operational for a period of five years from 2010 to 2015. The National Calamity Fund was merged with the NDRF and the Calamity Relief Fund was merged with SDRF. The funds from both are to be used only to provide immediate relief to the people affected by cyclone, drought, earthquake, fire, flood, tsunami, hailstorm, landslide, avalanche, cloud burst and pest attacks. Funds for disaster preparedness, mitigation and restoration work must be met by the plan funds allocated for States<sup>186</sup>

**(4) National Disaster Mitigation Fund and State Disaster Management Fund (proposed under Disaster Management Act, 2005)**

The Disaster Management Act, 2005 also provides for setting up of a National Disaster Mitigation Fund for projects taken up exclusively for the purpose of mitigation. The NDMA is to administer this fund. At the state level these are to be established as the State Disaster Management Fund. These two funds were to be created at the national level and state levels respectively to fund mitigation efforts.

These two funds were to be created at the national level and state levels respectively to fund mitigation efforts. The NDMF is not yet operational and only a few states have made their State Disaster Response Funds (SDRF) operational. At present the mitigation efforts are financed through state plans<sup>187</sup>. The following Figure 5.1 provides a diagrammatic expression of legal-institutional framework of disaster management in India and other institutions integrated in disaster management system in India.

**Figure 5.1: Legal – Institutional Framework of Disaster Management in India**



*Source: Ref: Ministry of Home Affairs (2011) “Disaster Management in India Report 2011” Government of India Ministry of Home Affairs [Accessed on 12 April, 2016 at 5.59 p.m.]*

The **other institutional mechanisms** associated with disaster risk management in India are

I) The national level ministries and government departments associated with coordination of relief response and mitigation to disasters are described below:

- i.) Ministry of Home Affairs is the nodal ministry for coordination of relief and response and over all natural disaster management other than drought. In 2010, The Ministry of Home Affairs formulated the Standard Operating Procedure (SOP) for management of natural disaster. It lays down in a comprehensive and scientific manner actions required to be taken by various ministries, departments and organizations of Central, state and district administration for preparedness, early warning and response to natural disasters. It also provides relief and rehabilitation assistance to the effected community to natural disaster<sup>188</sup>.
- ii) Ministry of Agriculture and Cooperation is the nodal ministry for drought management.
- iii) Ministry of Civil Aviation for Air accidents.
- iv) Ministry of Railways for Rail accidents.
- v) Ministry of



Environment and Forests for chemical disasters. vi) Ministry of Health for Biological disasters  
vii) Department of Atomic Energy for nuclear disasters

**II)** Other decision making and standing bodies responsible disaster preparedness and response mechanism for disaster management at the nation level are: a.) National Crisis Management Committee and (b) Central Relief Commissioner. The National Crisis Management Committee (NCMC) under the chairmanship of the cabinet Secretary plays a coordinating role with all the Central Ministries and State Govt. during the crucial phase of disaster response and relief. The Central Relief Commissioner in the Ministry of Home becomes the focal point of coordination among various ministries to implement the decisions taken by the NCMC in relation to the disaster preparedness response and relief. The CRC operates immediate response and relief for distribution in disaster affected areas. The NGOs and civil society organizations are involved in relief and rehabilitation operations during and after the disaster<sup>189</sup>.

The National Crisis Management Committee (NCMC) is the apex decision making body in post disaster situations while the Crisis Management Group (CMC) working with Ministry of Home Affairs is the Nodal agency to coordinate all disaster relief response mechanism and National Disaster Management Authority (NDMA) is responsible for the deployment of NDRF to help save lives and evacuating people from disaster area. The NDRF is also responsible to train SDRF, community and NGOs in disaster management<sup>190</sup>.

The Crisis Management Group and Ministry of Home Affairs also coordinates with the State Governments and deploy Central Armed Police Force (CAPF). The SDRF constitute on the lines of NDRF is the nodal agency in the state Government that provides support to the district administration and local authorities which is responsible for on the spot management of disaster.

Highly specialized battalions (Eighth battalions) have been raised with state of the art technology to respond to disasters<sup>191</sup>

**III)** There are various established technically and scientifically oriented institutions that support and strengthen disaster management framework in India<sup>192</sup>. These are institutions are:

- (a) Indian Metrological Department (Cyclone/ earthquake).
- (b) Central Water Commission / floods)
- (c) Building and Material Promotion Council (construction rules and regulations)
- (d) Bureau of Indian Standard norms
- (e) Defense Research and Development Organization (nuclear / biological ) DRDO
- (f) Directorate General Civil Defense provides specific technical support to coordination of disasters response and management functions.
- (g) Indian National Centre for Oceanic Information System (INCOIS) for Tsunami warning post 26<sup>th</sup> December 2004 Tsunami when the Ministry of Earth Sciences established the INCOIS.
- (h) Geological Survey of India (GSI) (landslide hazard)
- (i) ISRO Indian Space Research Organization provide support and services for aero space system both imaging and communications for efficient management of disasters in the country.
- (j) Department of Atomic Energy (Nuclear or radiological emergency)
- (k) Drought Relief Measures managed by Ministry of Agriculture and Cooperation.
- (l) The National Disaster Response Force (NDRF) and State Disaster Response Force (SDRF)

**IV)** A number of institutions have been developed and working at the national level for capacity building. To build the resilience of the community and the household, dissemination of information, creating awareness, training programme activities and other activities are carried by NIDM. According to a study by NIDM, Capacity – Risk ratio is low in India. In this direction the NIDM is to develop comprehensive plan on disaster management, mainstreaming disaster management in education and take up several initiatives and training programmes for capacity building<sup>193</sup>.

**V)** The Government of India under the Twelfth Plan (2007 – 2012) through NIDM has set up Disaster Management Centres in the State for capacity building.<sup>247</sup> A community based disaster Risk management Programme for community capacity development and public awareness has been implemented in 17 States and Union territory covering 169 multi hazard prone district in these states<sup>194</sup>.

This programme imparts training at the village level to develop a village level Disaster Management Plan to identify hazard specific mitigation activities. The National Emergency operation (EOC) set up by the Ministry of Home Affairs and also in state and district areas that have a satellite based communication network to provide information on disaster situations and help in evaluation of vulnerable persons providing relief and essential commodities during emergency situations<sup>195</sup>

Against the above backdrop it becomes quite clear that India has an elaborate system of disaster management framework hierarchical in structure to address the challenges of management of disasters. The main task of this elaborate system is to lay the framework of legal-institutional

mechanisms to deal with disaster scenario, secure the lives of the people and to ensure financial investment for capacity building in disaster management sector.

### ***Natural Disaster Management and Five Year Plans: India***

To reduce the vulnerabilities of the people particularly the poor, to fulfill the vision of the national policy on disaster management, to build a safer and disaster resilient India with focus on inclusive growth financing of disaster management programmes is the major policy option to reduce disaster risks. The task is carried in the form of allocation of funds for calamity relief and post-disaster reconstruction programmes as well as capacity building programmes through policy matrix initiatives that works in the direction of disaster risk reduction. The allocation of funds for various plans and policies for disaster risk reduction by different ministries is managed through the Five Year Plans and Annual Plan allocations. The best policy option is to invest in mitigation activities that are much more cost effective than expenditure on relief and rehabilitation.

India after independence has embarked on Five Year Plan regime to realize the dream of economic development characterized by centralized planning that generated some major debates regarding the adoption of planning strategy in India<sup>196</sup>. The result was state-led-development and protectionist policy that was radically changed with New Economic Policy 1991, launched by the then Prime Minister Narasimha Rao with Manmohan Singh as the Finance Minister by adopting liberalization, privatization and globalization the major radical reforms since independence, moving from state-led-development towards market oriented economy<sup>197</sup>. This has generated major debates on neo-liberal policy reforms adopted by the state in all major theoretical propositions regarding Indian economy and role of the state<sup>198</sup>.

Economic planning in India is a continuous process of evolving choices, applying alternative methods of using available resources with the aim of achieving particular goals for common good. With the First Five Year Plan in (1951-56), India has already implemented 12 successive Five Year Plan with two Annual Plans (1990-91) and (1991-1992) before the adoption of the Eighth Plan in 1992-97. In the last 70 years India has altogether 12 Five Year Plans. The current 12<sup>th</sup> Plan (2012-2017) is running at present<sup>199</sup>. The following Table 5.7 provides a detailed description of the planned expenditure and GDP growth covering the plan period from 1951-2017. The projected growth rate for the current plan period (2012-2017) has been estimated at 8% as approved growth rate for 12<sup>th</sup> Five Year Plan<sup>200</sup>.

**Table 5.7: Growth Rates in India (estimated) over Successive Plan Periods (1951-2015)**

<i>Plan Period</i>		<i>Annual Growth Rate of GDP (Factor Cost %)</i>	<i>Average Annual Gross GD Capital Formation as % of GDP at Factor cost</i>
<i>I</i>	<i>1951-1956</i>	<i>3.6</i>	<i>10.3</i>
<i>II</i>	<i>1956-1961</i>	<i>4.2</i>	<i>15.4</i>
<i>III</i>	<i>1961-1966</i>	<i>2.8</i>	<i>15.6</i>
<i>IV</i>	<i>1969-1974</i>	<i>3.3</i>	<i>17.00</i>
<i>V</i>	<i>1974-1979</i>	<i>4.8</i>	<i>20.2</i>
<i>VI</i>	<i>1980-1985</i>	<i>5.6</i>	<i>21.9</i>
<i>VII</i>	<i>1985-1990</i>	<i>6.0</i>	<i>25.2</i>
<i>VIII</i>	<i>1992-1997</i>	<i>6.7</i>	<i>25.4</i>
<i>IX</i>	<i>1997-2002</i>	<i>5.5</i>	<i>25.9</i>
<i>X</i>	<i>2002-2007</i>	<i>7.6</i>	<i>27.51</i>
<i>XI</i>	<i>2007-2013 (estimated)</i>	<i>6.7</i>	<i>34.90</i>

*Source: Ref: D.M. Machane (ed) (2011) India Development Report 2011 Indira Gandhi Institute of Development Research Oxford. Oxford University Press. New Delhi 2011. pp 2*

The policy matrix for funding disaster risk reduction (DRR) in India systematically began with the Tenth Five Year Plan. The Tenth Five Year Plan (2002-2007) for the first time recognized that disaster risk reduction is an important issue for planned and sustainable development. The

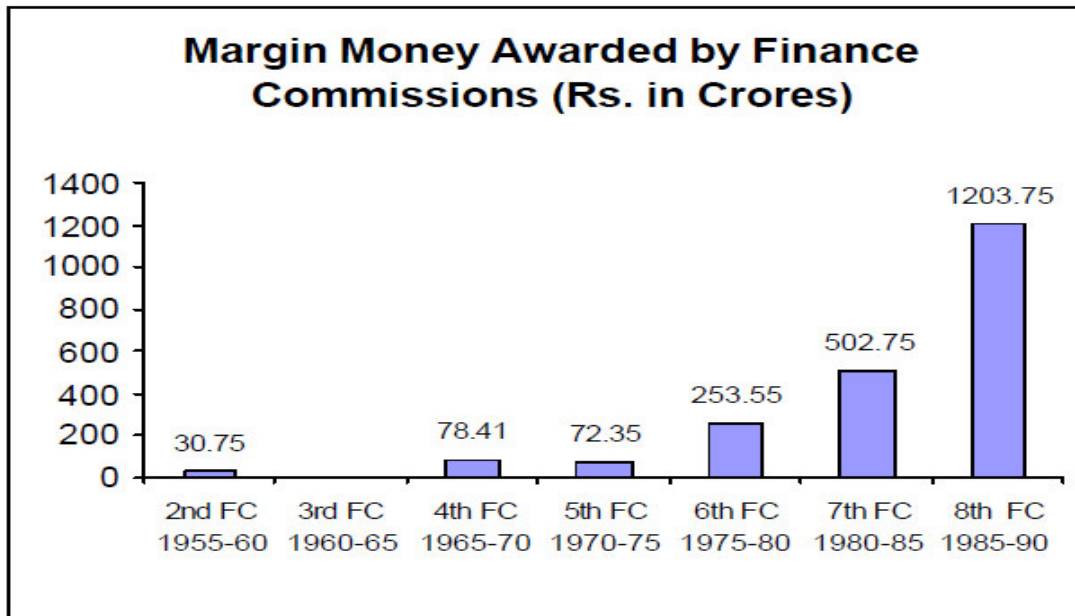
policy recommendation for meeting relief expenditure till now was based on successive finance commissions and such expenditures were met through Calamity Relief Fund (CRF) and National Calamity Contingency Fund (NCCF)<sup>201</sup>. The Eleventh Finance Commission recommended the setting up of the National Calamity Contingency Fund (NCCF) with an initial corpus of Rs. 500 crores contributed by the Government of India.

The NCCF could be used only after the funds allocated for CRF were exhausted. During the period of 2000-2005 and 2005-2010 an amount of Rs. 8063 crores and Rs. 10,671 crores respectively were released from NCCF to meet the contingent expenditure on Disaster Relief and response that was unable to be met by CRF<sup>202</sup>.

An analysis of the Five Year Plan reveals that the First Finance Commission (1950-1955) did not make any recommendation regarding the financing of relief expenditure of the states. The successive finance commissions had to deal with the issue of financing calamities and damages and losses incurred by the states for disaster management. From the Second Finance Commission (1955-60) onwards a innovative concept of “**Margin Money**” was generated to set aside a separate fund for meeting expenses on natural calamities.

During 1955-60 the margin money allocated to the states was Rs. 13.75 crores that steadily increased to Rs. 1203.75 crores during 1985-90<sup>203</sup>. The following Figure 5.2 provides a diagrammatic expression of the Margin Money awarded by Finance Commissions since the 2<sup>nd</sup> Finance Commission to 8<sup>th</sup> Finance Commission (1955-90).

**Figure 5.2: Margin Money Awarded by Finance Commission from 1955-1990**



*Source: Ref: Dhar, Chakrabarty, P.G. (2009) – Financing Disaster Management in India: A Study for the Thirteenth Finance Commission. National Institute of Disaster Management New Delhi [Accessed on 19 March 2015 at 3.57 p.m.] pp 41*

The above diagram clearly explains that margin money allocation was less during the 5<sup>th</sup> Finance Commission compared to 4<sup>th</sup> Finance Commission whereas the 6<sup>th</sup> Finance Commission increased the allocation substantially across all states, with Rajasthan, Bihar, Bengal and Maharashtra as major gainers. From the 4<sup>th</sup> to 8<sup>th</sup> Finance Commission the top five states those received highest priorities were Bihar, West Bengal, Uttar Pradesh, Gujarat and Orissa. The following Table 5.8 explains the above allocation of margin money for states in India during 1955- 1985. During all these decades the states received margin money for relief and rehabilitation of the people affected by disasters.

**Table 5.8: Allocation of Margin Money for States in India (Rs. In crores) 1955-1985**

<b>Allocation of Margin Money (Rs. In Crores)</b>						
State	1955-60	1965-70	1970-75	1975-80	1980-85	
1. Andhra Pradesh	3.75	3.75	3.75	21.55	122.5	
2. Assam	1.25	2	2.4	6.25	36.25	
3. Bihar	5	7	7.5	23.05	168.75	
4. Gujarat	-	4	4	22.75	143.75	
5. Haryana	-	-	7.75	6.2	22.5	
6. Himachal Pradesh	-	1.4	0	0.15	8.75	
7. Jammu & Kashmir	0.5	1.4	2	1.75	7.5	
8. Karnataka	1.5	1.65	2.2	9.55	30	
9. Kerala	2	0.5	0.5	1.5	25	
10. Madhya Pradesh	0.75	1.5	4	17.05	23.75	
11. Maharashtra	-	3	4.3	20.85	36.25	
12. Manipur	-	-	-	0.2	1.25	
13. Meghalaya	-	-	-	0.2	1.25	
14. Nagaland	-	-	-	0.1	1.25	
15. Orissa	2.5	6.15	6.25	17.9	131.25	
16. Punjab	2	9.85	2.05	1.65	30	
17. Rajasthan	2	4.65	5.4	50.95	83.75	
18. Sikkim	-	-	-	-	1.25	
19. Tamil Nadu	2.5	2.5	2.5	7.6	43.75	
20. Tripura	-	-	-	0.35	3.75	
21. Uttar Pradesh	2	3.75	4.7	10.9	162.5	
22. West Bengal	4	26.75	13.05	33.05	118.75	
Total	78.45	78.45	72.35	253.55	1203.75	

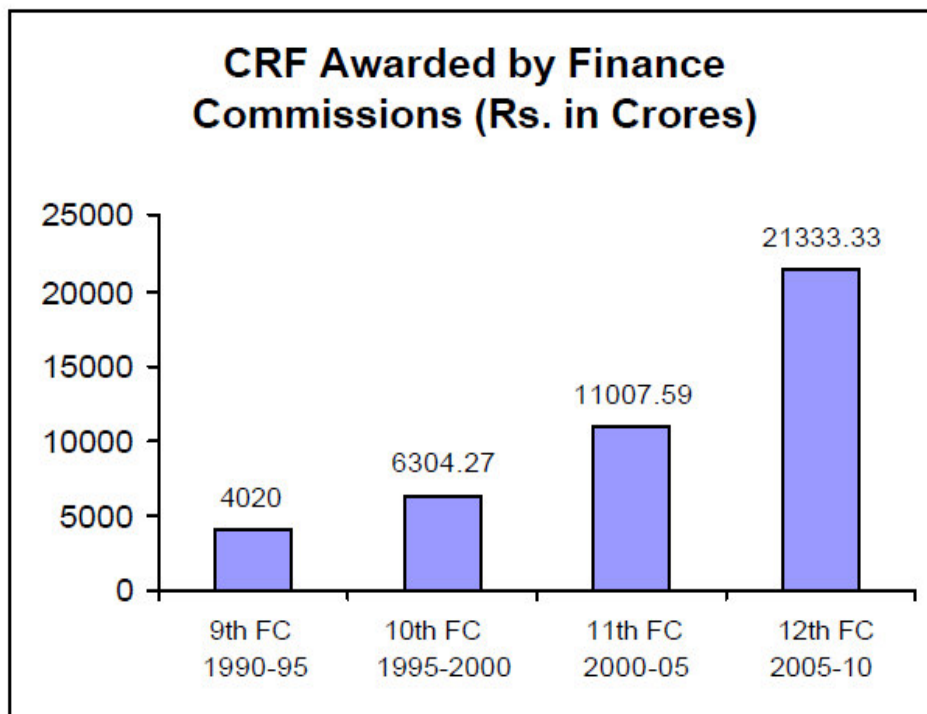
*Source: Ref: Dhar, Chakrabarty, P.G. (2009) – Financing Disaster Management in India: A Study for the Thirteenth Finance Commission. National Institute of Disaster Management New Delhi [Accessed on 19 March 2015 at 3.57 p.m.] pp 42*

The Ninth Finance Commission constituted the Calamity Relief Fund (CRF) to be contributed by the Central and State Governments on 75:25 contribution basis as non-plan grant. The Tenth (1995-2000), Eleventh (2000-2005) and the Twelfth Finance Commission (2005-2010) has retained the CRF Scheme with few modifications. Since 10<sup>th</sup> Finance Commission, CRF allocation to states have registered a phenomenal increase from Rs. 4020 crores during 1990-1995 to Rs. 21,333.33 crores during 2005-2010 (Twelfth Finance Commission)<sup>204</sup>. The following



Figure 5.3 provides a diagrammatic presentation of CRF from 9<sup>th</sup> Finance Commission till 12<sup>th</sup> Finance Commission.

**Figure 5.3: Calamity Relief Fund Awarded by Finance Commission during 9-12<sup>th</sup> Finance Commission Allocation**



*Source: Ref: Dhar, Chakrabarty, P.G. (2009) – Financing Disaster Management in India: A Study for the Thirteenth Finance Commission. National Institute of Disaster Management New Delhi [Accessed on 19 March 2015 at 3.57 p.m.] pp 45*

The above Table shows that there has been sharp increase in allocation in almost all the states. Priorities shifted towards Rajasthan, Andhra Pradesh, Uttar Pradesh and Gujarat compared to Orissa, West Bengal and Bihar who get less priorities in CRF allocations.

The following table 5.9 shows the allocation of calamity relief fund for respective states during 1990-2010 with a tendency on the increase.

**Table 5.9 Allocation of Calamity Relief Fund (Rs. In Crores) For States in India 1990-2010**

Allocation of Calamity Relief Fund (Rs. in Crores)						
		1990-95	1995-2000	2000-05	2005-10	Total
1.	Andhra Pradesh	430.00	653.77	1094.40	1901.24	4079.41
2.	Arunachal Pradesh	10.00	37.05	66.43	150.07	263.55
3.	Assam	150.00	263.28	560.81	1023.84	1997.93
4.	Bihar	175.00	273.53	683.28	789.83	1921.64
5.	Jharkhand	-	-	-	592.6	592.6
6.	Goa	5.00	5.64	6.85	11.64	29.13
7.	Gujarat	425.00	734.90	891.84	1359.3	3411.04
8.	Haryana	85.00	131.90	449.26	687.28	1353.44
9.	Himachal Pradesh	90.00	141.88	240.29	534.01	1006.18
10.	Jammu & Kashmir	60.00	103.74	192.85	458.54	815.13
11.	Karnataka	135.00	220.30	412.04	668.61	1435.95
12.	Kerala	155.00	291.65	371.56	633.55	1451.76
13.	Madhya Pradesh	185.00	268.88	497.86	472.42	1424.16
14.	Chhatigarh	-	-	-	1348.37	1348.37
15.	Maharashtra	220.00	359.03	868.64	1231.68	2679.35
16.	Manipur	5.00	13.06	15.86	29.48	63.4
17.	Meghalaya	10.00	14.69	21.77	59.84	106.3
18.	Mizoram	5.00	6.67	16.42	34.9	62.99
19.	Nagaland	5.00	8.95	10.83	20.29	45.07
20.	Orissa	235.00	258.01	604.88	1599.16	2697.05
21.	Punjab	140.00	285.07	678.10	806.88	1910.05
22.	Rajasthan	620.00	942.52	1143.81	2296.68	5003.01
23.	Sikkim	15.00	24.79	38.17	92.97	170.93
24.	Tamil Nadu	195.00	312.45	567.14	1155.28	2229.87
25.	Tripura	15.00	23.67	28.73	68.14	135.54
26.	Uttar Pradesh	450.00	658.67	987.11	1569.49	3665.27
27.	Uttaranchal	-	-	-	492.38	492.38
28.	West Bengal	200.00	270.17	558.66	1244.86	2273.69
	<b>Total</b>	<b>4020.00</b>	<b>6304.27</b>	<b>11007.59</b>	<b>21333.33</b>	<b>43750.17</b>

*Source: Dhar, Chakrabarty, P.G. (2009) – Financing Disaster Management in India: A Study for the Thirteenth Finance Commission. National Institute of Disaster Management New Delhi [Accessed on 19 March 2015 at 3.57 p.m.] pp 46*

Under the Tenth Plan (2002-2007) fund allocations were particularly meant for schemes and programmes to integrate disaster risk management in planning procedure under general categorization. The following Table 5.10 presents the annual allocation under eight categories of

the scheme during the Tenth Five Year Plan where the first two components are developmental in nature while the rest were in the category of revenue expenses<sup>205</sup>.

**Table 5.10: Natural Disaster Mitigation Programme Year wise Allocation of Funds under eight categories in the Tenth Five Year plan 2002-2007)India**

<i>Sl. No.</i>	<i>Components</i>	<i>2002-03</i>	<i>2003-04</i>	<i>2004-05</i>	<i>2005-06</i>	<i>2006-07</i>	<i>Total</i>
<i>1</i>	<i>Grants in Aid</i>	<i>262.0</i>	<i>349.00</i>	<i>474.00</i>	<i>505.00</i>	<i>600.00</i>	<i>2190.00</i>
<i>2</i>	<i>Professional Service</i>	<i>20.00</i>	<i>29.00</i>	<i>54.00</i>	<i>110.00</i>	<i>150.00</i>	<i>363.60</i>
<i>3</i>	<i>Machinery Equipments</i>	<i>2.00</i>	<i>20.00</i>	<i>30.00</i>	<i>15.00</i>	<i>10.00</i>	<i>77.00</i>
<i>4</i>	<i>Foreign Travel</i>	<i>80.00</i>	<i>30.00</i>	<i>25.00</i>	<i>40.00</i>	<i>50.00</i>	<i>225.00</i>
<i>5</i>	<i>Contribution</i>	<i>20.00</i>	<i>20.00</i>	<i>20.00</i>	<i>17.00</i>	<i>20.00</i>	<i>97.00</i>
<i>6</i>	<i>Office Expenses</i>	<i>2.50</i>	<i>3.00</i>	<i>2.00</i>	<i>2.00</i>	<i>2.00</i>	<i>11.50</i>
<i>7</i>	<i>Advertisement and Publicity</i>	<i>20.00</i>	<i>10.00</i>	<i>25.00</i>	<i>1.00</i>	<i>1.00</i>	<i>57.00</i>
<i>8</i>	<i>Other Charge</i>	<i>0.50</i>	<i>26.00</i>	<i>10.00</i>	<i>10.00</i>	<i>10.00</i>	<i>56.50</i>
	<i>Total</i>	<i>407.00</i>	<i>487.00</i>	<i>640.00</i>	<i>700.00</i>	<i>843.00</i>	<i>3077.00</i>

*Source: Ref: Planning Commission of India 2008: "11th Five Year Plan (2007-12) Vol. 1. Inclusive Growth" and Disaster Management Division 2008 Ministry of Home Affairs Government of India, (Oxford: Oxford University Press, New Delhi) pp 208*

The Tenth Five Year Plan initiated for the first time the need for planned expenditure on disaster mitigation and prevention measures besides the Calamity Relief Fund for disaster management. The Tenth Plan fell short recommending any specific plan or programme for prevention mitigation or preparedness for disasters. It also fell short of allocating any amount for such scheme except making a general recommendation for "creation of facilities in disaster risk reduction in all 28 States proposed to be taken up in the Tenth Plan in addition to community mobilization, human resource development, establishment of central rooms and forging international cooperation in disaster risk reduction".

In recent years another mechanism that has been developed in addition to the allocation arrangements made by successive Finance Commission is addressed as Additional Central Assistance (ACA) for partly meeting the needs of the states for post-disaster reconstruction.

Central assistance to the affected states comes as a mix of loan and grant on the ratio of 70:30 for general states and 90:10 for Special Category states. These funds are soft loans raised from multi-lateral funding institutions and passes on to the states as Additional Central Assistance. Few instances below show this projection<sup>206</sup>.

- (a) The Gujarat earthquake of 2001 loans raised form World Bank of Rs. 7936 crores for funding multi-sectoral projects over a five year long period.
- (b) Indian Ocean Tsunami of 2004, loans were raised from World Bank and Asian Development Bank and Additional Central Assistance (ACA) worth Rs. 11,907.20 crores were passed on to the affected states of Tamil Nadu, Kerala, Andhra Pradesh, Union Territories of Andaman and Nicobar Islands and Pondicherry for long term rehabilitation and reconstruction.
- (c) The Kashmir Earthquake of 2005, Additional Central Assistance (ACA) of Rs. 635.88 crores were released to Jammu & Kashmir for a three year reconstruction programme.
- (d) The Monsoon Flood of 2005 that affected 12 states, Additional Central Assistance of Rs. 5323.26 crores was released to all states.

The data compiled by the states for disaster wise relief expenditure at the all India level very clearly sets the trends that the overall pattern of expenditure during the period of 2002-2008 shows that Floods, Droughts and Cyclones consume more than 88% of the total relief expenditure of the states. Moreover the expenditure under different heads incurred by the states

during and after post disaster scenario was in the category of immediate relief and rehabilitation than post disaster mitigation<sup>207</sup>.

The following Table 5.11 presents the pattern of distribution of Relief Expenditure incurred by states across calamities during the period of 2002-2008:

**Table 5.11: Distribution of Relief Expenditure by States across Calamities (Rs. In crores) during 2002-2008, India**

<b>Distribution of Relief Expenditure by States across Calamities (Rs. in Crores)</b>							
	<b>Drought</b>	<b>Floods</b>	<b>Fire</b>	<b>Cyclones</b>	<b>Hailstorms</b>	<b>Others</b>	<b>Total</b>
2002-03	2264.88	389.08	10.00	363.53	26.14	335.94	3389.57
2003-04	2273.73	592.69	40.91	17.60	31.36	114.16	3070.45
2004-05	1671.01	949.02	40.95	8.02	61.30	254.68	2984.98
2005-06	1004.09	3005.02	48.92	106.35	76.90	48.20	4289.48
2006-07	1055.34	4724.30	65.64	13.59	237.56	34.97	6131.40
2007-08 (R.E.)	925.38	2950.80	83.47	84.63	276.23	644.80	4965.31
2002-08	9194.43	12610.91	289.89	593.72	709.49	1432.75	24831.19

*Source: Ref: Dhar Chakrabarty, P.G. (2009) "Financing Disaster Management in India: A Study for the Thirteenth Finance Commission" National Institute of Disaster Management New Delhi [Accessed on 19 March 2015 at 3.57 p.m.] pp 62*

The Eleventh Five Year Plan (2007-2012) clearly suggested the task of funding disaster management needs to be addressed by the Planning Commission, which in consultation with the state governments and concerned ministries of Government of India should develop programmes for capacity building to prevent the recurrence of specific calamities, that could be financed under five year plan fund schemes for mainstreaming disaster reduction particularly in the sectors of education, health, housing, infrastructure, urban and rural development<sup>208</sup>.

The Eleventh Plan also envisaged disaster risk reduction by considering investment in a number of Risk Mitigation projects and strategies on the recommendation of the Working Group and National Disaster Management Authority. The projects includes Cyclone Risk Mitigation Project, Earthquake Risk Mitigation Project, Landslide Mitigation Project, Disaster Communication Network, Information Education and Communication Programme (IEC), Microzonation of Major cities, Vulnerability Assessment Schemes and Upgradation of National Institute of Disaster Management (NIDM)<sup>209</sup>

The Eleventh Plan also laid down the details of these projects to be incorporated within the sectoral allocation of ministries concerned but without any commitment for funding these projects. Out of all the projects mentioned above only the project on National Cyclone Risk Mitigation with a total plan outlay of Rs. 1496.71 crores was approved and launched during the Eleventh Plan period<sup>210</sup>.

Currently under the 12<sup>th</sup> Five Year Plan (2012-2017) in addition to allocation of funds proposed for mainstreaming disaster risk reduction in major development programmes in 11<sup>th</sup> Five Year Plan and in science and technology funds have been allocated for 12 projects to be undertaken in disaster risk reduction by Government of India and National Disaster Management Authority. Out of all the 12 projects for the 12<sup>th</sup> Five Year Plan outlay only the National Cyclone Risk Mitigation projects has been started in the states of Andhra Pradesh and Orissa with World Bank assistance which is carrying forward the already mentioned project in the 11<sup>th</sup> Plans funds for which funds were allocated during the 11<sup>th</sup> Plan period<sup>211</sup>. These proposed projects for mainstreaming disaster risk reduction in major development programmes under the twelfth plan are presented below in the Table 5.12:

**Table 5.12: Proposed Projects under 12<sup>th</sup> Five Year Plan (2012-2017) under National Disaster Management Authority, India**

SL. No.	Title of the Programme	Proposed outlay Rs. /n Crores
1	National Cyclone Risk Mitigation Project	Rs. 2900.00
2	National Earthquake Risk Mitigation Project	Rs.600.00
3	Landslide Risk Mitigation Project	Rs. 500
4	Flood Risk Mitigation Project	Rs. 300
5	National Disaster Communication Network	Rs. 1000.00
6	Strengthening of District Disaster Management Authority (DDMA) and State Disaster Management Authority (CDMA) and setting up of Emergency Operation Centres (EOCs)	Rs. 800.00
7	Strengthening State Disaster Response Force	Rs. 800.00
8	A: National Disaster Management Training Institute B: Nation Disaster Response Force	Rs. 500.00 Rs. 2500.00
9	National Programme On Disaster Knowledge	Rs. 100
10	National Programme on Disaster Education and Research A: School and Higher Education B: Technical Education C: Medical Education D: Management and Legal Education E: National Programme on Disaster Training of NGO's Civil Society and private sector groups, Govt. Officers and Strengthening Institutional Companies.	Rs. 260.00 Rs. 350.00 Rs. 300.00 Rs. 150.00 Rs. 500.00
11	National Programme on Disaster Awareness and Advocacy	Rs. 1800.00
12	Other D M Projects (ODMPS)	Rs. 1700
	<b>Total outlay proposed</b>	<b>Rs. 15,060.00</b>

*Source: Ref: Government of India, Planning Commission 2011, Report of the Working Group on Disaster Management for the 12<sup>th</sup> Five Year Plan (2012-2017) 31<sup>st</sup> October, 2011 [Accessed on 15 February 2015 at 8.30 a.m.] pp 108*

### ***Funding Mechanism for Disaster Management***

a) The funding mechanism for providing financial assistance in post disaster situation is coordinated by Ministry of Home Affairs which is the nodal agency for providing financial assistance. The Disaster Management Act, 2005 constituted the funding mechanisms related to disaster management at 2 levels (1) National Disaster Response Fund at the national level

(NDRF- Section 46 of the Disaster Management Act) and (2) State Disaster Response Fund at the state level (SDRF – under Section 48 of the Disaster Management Act).

Based on the recommendations of the 13<sup>th</sup> Finance Commission (2010-2015) the schemes of National Disaster Response Fund and State Disaster Response Fund were made operational for a period of five years from 2010 to 2015. The funds from both were to be used on to provide immediate relief to the people affected by natural disasters. These funds were not for disaster preparedness, mitigation, restoration and rehabilitation which must be met from plan funds allocated to the states<sup>212</sup>.

The 13<sup>th</sup> Finance Commission recommended annual contribution to State Disaster Response Fund to be seventy-five percent (75%) of the total yearly allocation to general category states and ninety percent (90%) of the total yearly allocation to special category states in the form of non-plan grant by the central government. The balance was to be contributed by state governments. Natural calamities that require excess expenditure of the State Disaster Response Fund receive addition funding from National Disaster Response Fund<sup>213</sup>.

The 13<sup>th</sup> Finance Commission also recommended that the National Calamity Contingency Fund (NCCF) should be merged with National Disaster Response Fund and balances in the National Calamity Contingency Fund by the end of 2010 to be transferred to National Disaster Response Fund and similarly the Calamity Relief Fund (CRF) should be merged with State Disaster Response Funds and balances with Calamity Relief Fund to be transferred to State Disaster Response Funds respectively.



The Commission awarded a total of Rs. 33,581 crores to be shared by the states during the current fiscal session of 2010-2015 representing a 57.41% increase in overall allocation during 2005-2010<sup>214</sup>.

The Disaster Management Act also envisaged two funds to be created at the national and state levels respectively to fund mitigation efforts. These are i) The National Disaster Mitigation Fund (NDMF – Section 47 of Disaster Management Act) and ii) The State Disaster Mitigation Fund (SDMF – Section 48 of Disaster Management Act) The National Disaster Mitigation Fund was placed at the disposal of National Disaster Management Authority which is not operational at present and though many states have made their State Disaster Response Funds operational. At present the mitigation efforts are financed through state plans<sup>215</sup>.

ii) A study was conducted on understanding existing methodologies for allocating and tracking disaster risk reduction resources in India led to an in-depth survey on Dedicated Schemes with hundred percent allocations earmarked for disaster management. An extensive search into under different schemes and programmes of all ministries and departments led to identification of 37 dedicated schemes of 8 Ministries / Department exclusively dedicated to disaster management.

The total financial allocations on these schemes and programmes in the financial year 2011-2012 was Rs. 11,708.47 crores that is equivalent to 0.94% of the Union Budget with focus on disaster response and relief<sup>216</sup>. The following Table 5.13 presents the allocation on Dedicated Schemes on Disaster Management showing a growth pattern that is expected to improve with mitigation projects being implemented from 2005-2012 onwards.

**Table 5.13: Percentage of Allocation on Dedicated Schemes on Disaster Management (in Rs. Crore) 2005-06 – 2011-12 (India)**

Financial Year	Total Budget Allocation Plan	Growth percentage	Total Budget Allocation Non-Plan	Growth	Total Budget Allocation (plan and non-plan)	Growth percentage
2005-06	143.60	-----	5684.10	-----	5827.70	-----
2006-07	275.20	91.7%	6286.10	10.60%	6865.20	17.80%
2007-08	952.10	246.00%	5320.40	-15.40%	6273.50	-8.60%
2008-09	1806.40	89.70%	5253.10	-1.30%	7059.40	12.50%
2009-10	2206.00	22.10%	7379.80	40.50%	9585.80	35.70%
2010-11	2715.20	23.10%	8702.30	17.90%	11417.40	19.10%
2011-12	1843.20	32.10%	9865.20	13.40%	11708.50	2.50%

*Source: Ref: Dhar Chakraborty, P.G. (2012) "Understanding Existing Methodologies for Allocating and Tracking Disaster Risk Reduction Sources in India" UNISDR and ADPC Study: Regional Stocktaking and Mapping of Disaster Risk Reduction Investments For Asia Pacific January 2012. [Accessed on 19 March 2015 at 3.51 p.m.] pp 40*

From the perspective of disaster risk reduction a detailed enquiry regarding various schemes and programmes was conducted to bring out information on embedded schemes related to disaster mitigation. These schemes were formulated without any direct objective of risk reduction but they have the potentials for capacity building and to promote the cause of risk reduction. Looking into a complex maze of schemes and sub-schemes and programmes of 75 Ministries / Departments of Government of India, 85 plan and non-plan schemes (2011-2012) have been identified that have the potential for reducing the risks of disasters covering diverse range starting from agricultural development programmes to health, food security, housing, poverty alleviation, earth science, protection of earth and forests, ecosystems and climate change, education, strengthening local self government, land resources, women and child welfare, youth affairs and sports. The total allocation for these 85 schemes and sub-schemes for the year 2011-

2012 was Rs. 3,96,272.26 crores that is equivalent to 32.02% of the total Union Budget of Government of India<sup>217</sup>.

The following Table 5.14 presents the allocation of funds on Embedded Schemes for general financial and social security sectors across 75 Ministries and Departments of Government of India showing an increasing growth pattern that may have the potentials to contribute to disaster risk reduction and capacity building in India.

**Table 5.14: Percentage of Allocation on Embedded Schemes for General Financial and Social Security and Welfare Schemes 2005-06 - 2011-12, India**

Financial Year	Total Budget Allocation (plan and Non-Plan)	Allocation on Embedded Schemes	% of Allocations
2005-06	514343.80	123574.71	24.03
2006-07	563991.13	150535.63	26.69
2007-08	680520.51	222789.81	32.74
2008-09	750883.53	230491.42	30.70
2009-10	1020837.70	330250.08	32.35
2010-11	1108749.20	372844.75	33.63
2011-12	1237728.83	396272.26	32.02

*Source: Ref: Dhar Chakraborty, P.G. (2012) – Understanding Existing Methodologies for Allocating and Tracking Disaster Risk Reduction Sources in India. UNISDR and ADPC Study: Regional Stocktaking and Mapping of Disaster Risk Reduction Investments For Asia Pacific. January 2012. [Accessed on 19 March, 2015 at 3.51 p.m.] pp 47*

An analysis of the fund allocation in the above presentation clearly indicates that only 1% (0.94% approx.) of the total allocation in the Union Budget (2011-2012) is exclusively dedicated to disaster management schemes, sub-schemes and programmes whereas 32% of the total Union Budget allocation is for schemes general financial, social security and welfare schemes that can be counted as schemes having potentials to reduce disaster risks.

iii) The Fourteenth Finance Commission has continued with the existing system of funding disaster relief in the (90:10) ratio of Centre-State contribution. The Commission has recommended an amount of Rs. 61,219 crores as an aggregate corpus of State Disaster Response

Fund for all states for the accrued period of (2015-2020) with states contributing 10% (Rs. 6,122 crores) to State Disaster Response Fund and remaining 90% (Rs. 55,097 crores) coming from Union Government<sup>218</sup>. This flow of funds and percentage shares of the states will continue as before. The current recommendation of 14<sup>th</sup> Finance Commission, projects that once with the implementation of Goods and Service Tax (GST) in place, the recommendation on disaster relief would be fully implemented<sup>219</sup>.

A clear pattern emerges regarding addressing the issue of disaster management in India that relief and response has a long experience of embedded plans and policies in the country. The government allocation and expenditure on disaster management has increased in all these years yet the amount (1% of the total budgetary allocation) is negligible compared to the amount required for relief and post disaster mitigation and reconstructions with additional calamity assistance coming as soft loans from multilateral financial institutions. There is surely a large gap to be fulfilled regarding existing arrangement of financing disaster management in India.

To substantiate a broad understanding on the above discussion and as a part of the study, a structured questionnaire survey was circulated to bring out the opinion of various respondents to issues related to disaster, development and human security in India. It was observed during analysis on the issue of being faced with the perennial problem of natural disaster and poverty among the South Asian states about 70% of the respondents felt that the incidence of poverty has is a close link with natural disaster while 20% of the respondents felt that poverty is not driven by natural disasters as there are other challenges to development in India and 10% of the respondents opted for the undecided category with no other opinions offered. Most of the

respondents agreed that India is highly impacted by disaster events and the incidence of poverty increase with each disaster event.

Regarding the role of the state in addressing disaster vulnerabilities the survey analysis reveals that 65% of the respondent felt the state plays a major role in addressing disaster vulnerabilities while 35% of the respondents were undecided. Interestingly in this group of respondents quite a few were of the opinion that mainstreaming of disaster management in plans and policies have been rather slow and segregated to disaster events. On the role of the state in India to incorporate disaster issues in plans and policies all the stakeholders and particularly the state is the major institution of disaster risk reduction in India. The state to a large extent has been able to incorporate disaster issues in plans and policies to bring about long term sustainable development for the country. There were respondents who expressed that effective incorporation of disaster management in plans and policies has been rather slow.

In **conclusion** it can be stated that the disaster management framework in India has undergone a significant transformation. After the mega disaster events in the 1990's followed by the Indian Ocean Tsunami 2004 a process of change has been witnessed in disaster management approach particularly resulting a shift in paradigm from the conventional response of relief and rehabilitation to a more holistic approach of comprehensive risk reduction and ensuring the resilience of the community to the hazards both natural and manmade.

India came out with a Status report on Disaster Management in August 2004 followed by the Disaster Management Act 2005 that set the parameters for future action in this regard. Given India's vulnerability and exposure to disasters, over the past decade India has made major strides in formulating guidelines, procedures and institutional arrangements to address disasters. This

new approach proceeds from the conviction that development cannot be sustainable unless disaster mitigation is built into the development process.

This was also in consistent with the Yokohama Strategy and “Plan of Action for a Safer World” 1994 and the Hyogo Framework for Action (2005-2015) that brought about changes in the overall disaster management strategy which was to link natural disaster, sustainable development and human security. India is a signatory to the Hyogo Framework for Action (2005-2015) and has commitments to develop a framework emphasizing disaster risk reduction and strengthening emergency response mechanism. Hence the international exercise to build the disaster management frame work has been integrated into various plans and policies, legal instruments and institutional arrangements

Further being part of the South Asian region the country has also joined the SAARC Framework of Action (2006-2015) for Comprehensive Disaster Management and Emergency Preparedness. Included in this process is the support of various multilateral organizations, international and national non-governmental organizations that are playing a significant role in this direction. The disaster management framework in India has been moving towards a more workable system to address disaster issues. The integration of regulatory, legal, institutional framework and financial assistance within the ambit of planned documents has been pursued to build an effective disaster management regime.

Against the above backdrop the working of the existing arrangements of disaster management framework in the country would be explored and understood in the light of case studies taken up in the next section of the study.

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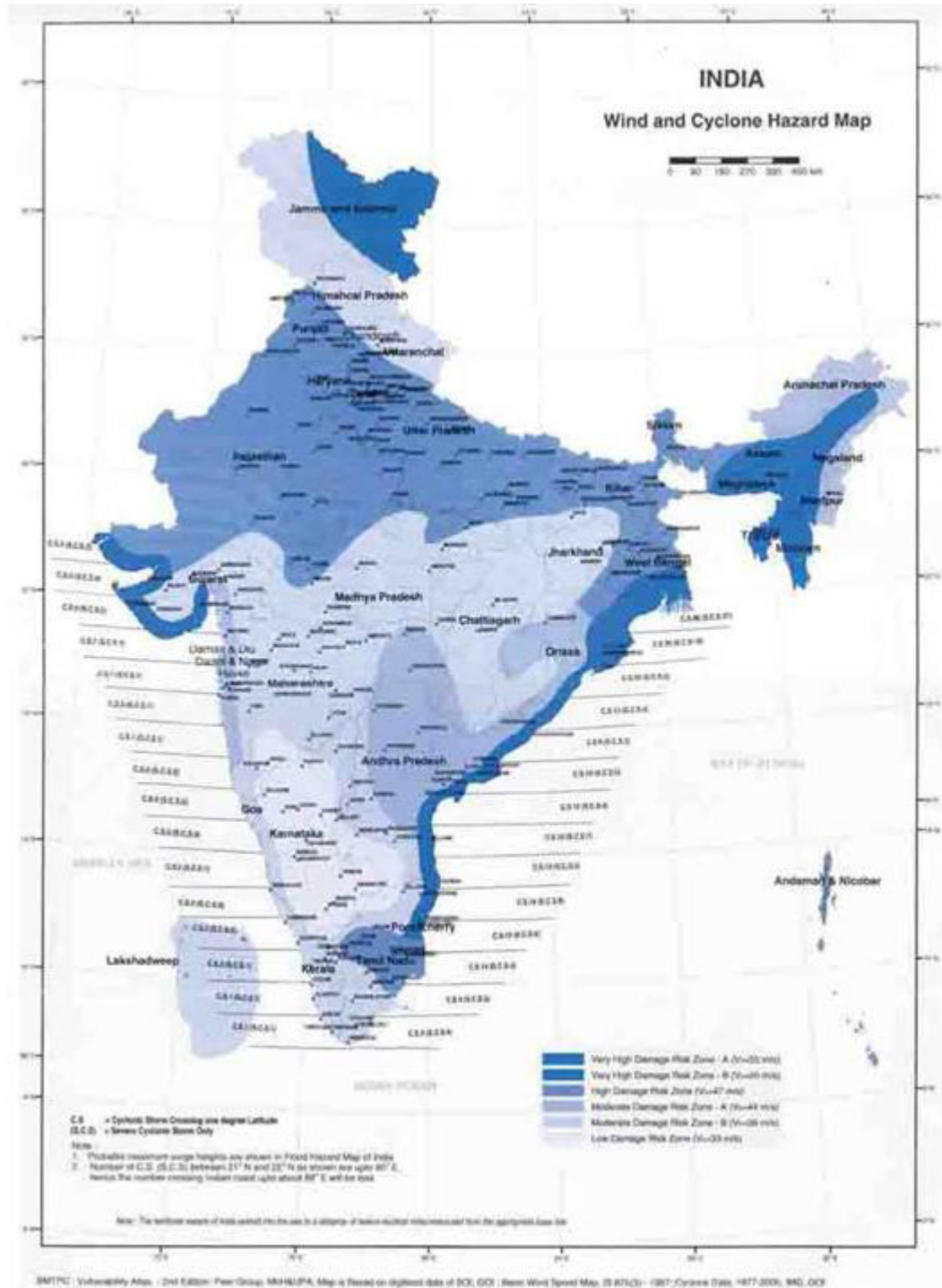
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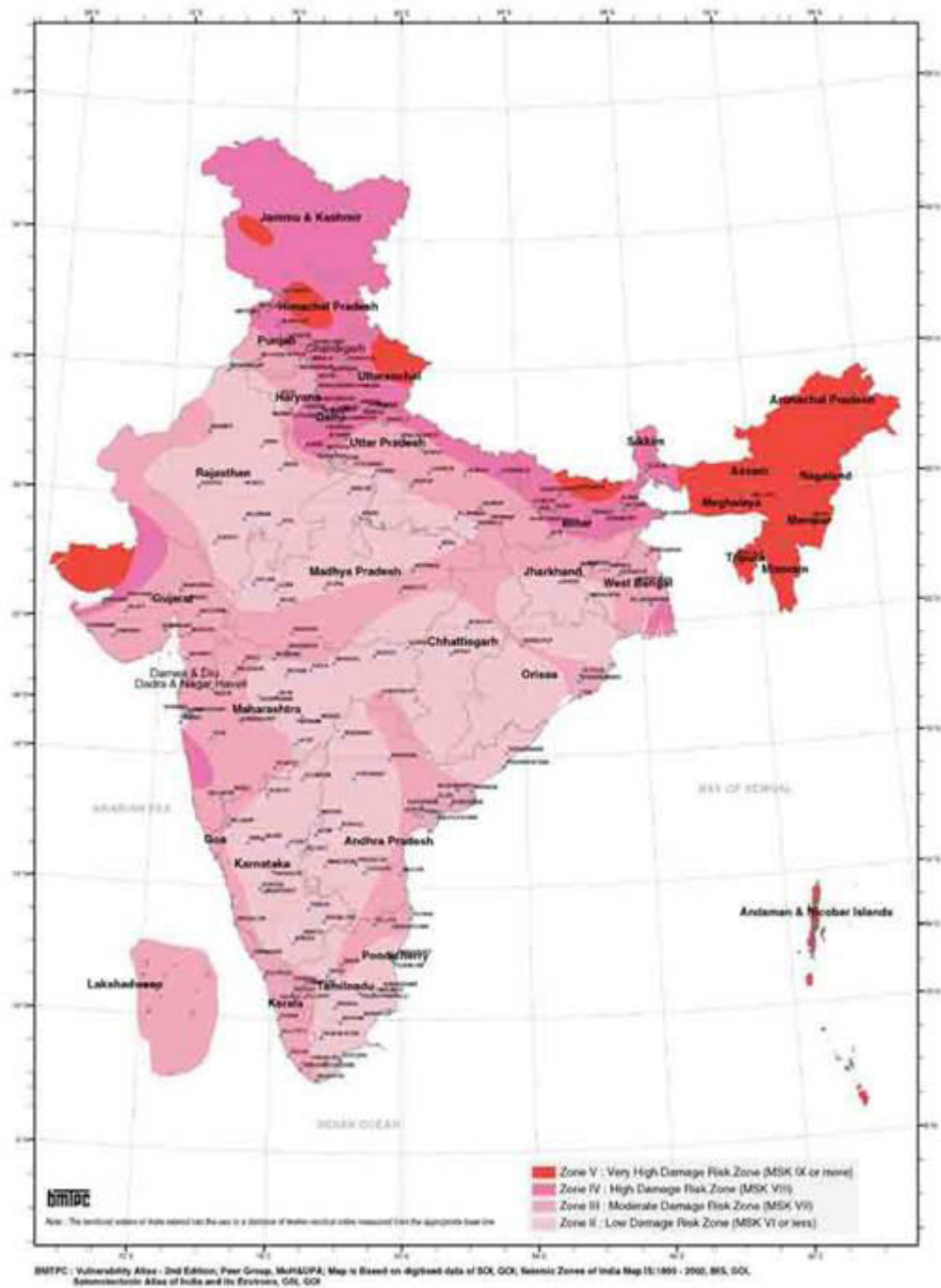
## Annexure – IA Vulnerability Profile Maps of India

Of the 7,516 km long coastline, close to 5,700 km is prone to cyclones and tsunamis.



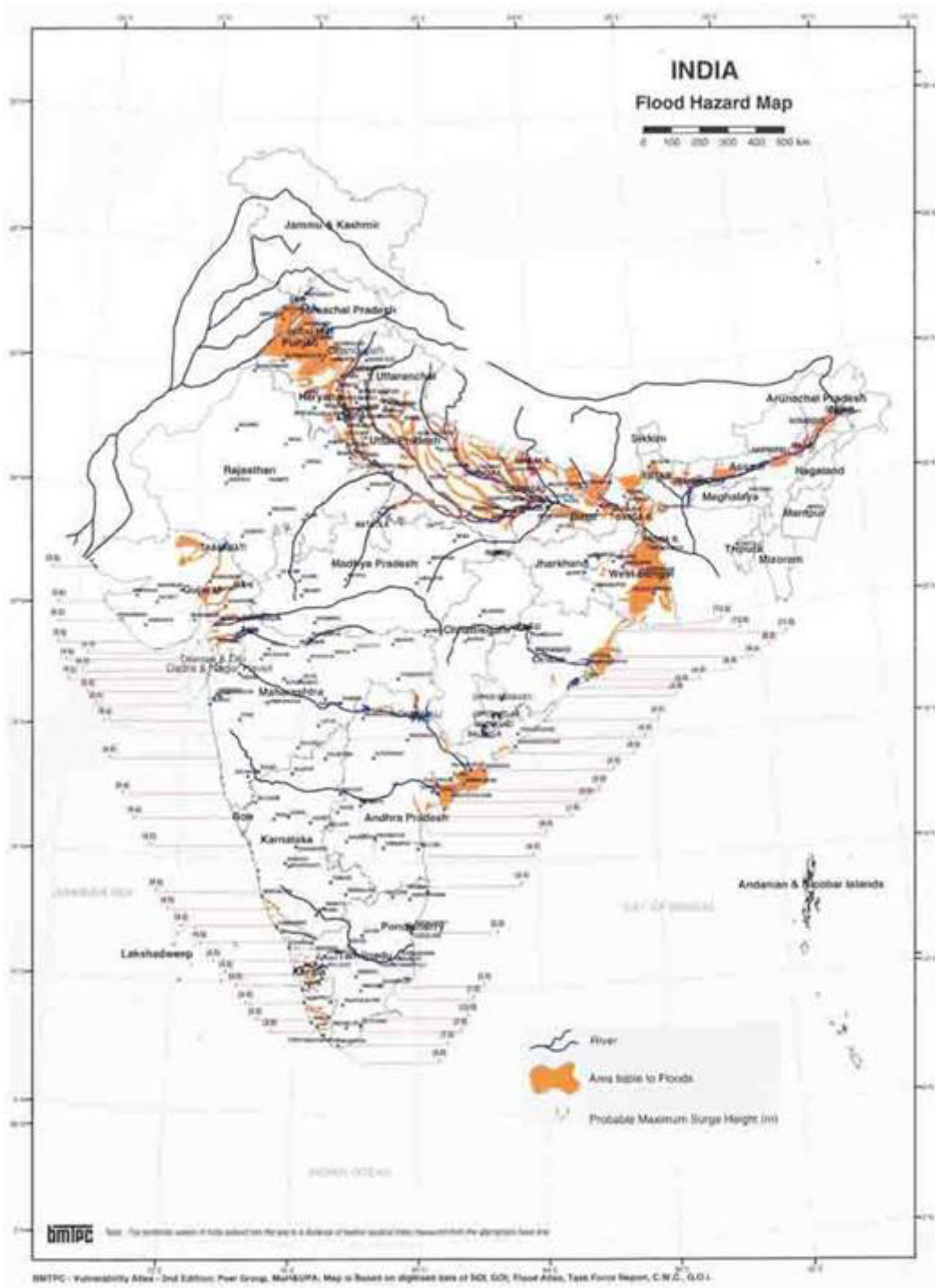
58.6 per cent of the landmass is prone to earthquakes of moderate to very high intensity.

## Annexure – IB Vulnerability Profile Maps of India



## Annexure – IC Vulnerability Profile Maps of India

Over 40 million hectares (12 per cent of land) is prone to floods and river erosion.



## ***CHAPTER – VI***

### ***Case Studies: Flood and Cyclone Case Studies challenging Disaster Management in India***

#### ***Introduction***

The linkages between natural disaster, vulnerabilities and risks associated with disasters and disaster management has to be examined and explored with the help of case studies to better understand the disaster scenario in India. Disaster risk reduction is the major focus of disaster management to be pursued so that sustainable development and human security concerns could better securitize the lives of the people. The case studies naturally help to understand the broad parameters of disaster risk management and preparedness in India.

Addressing specific case studies within the development perspective also brings out an understanding on the sustainable development agenda and human security linkage. The case studies (Case Study A: on Kosi Flood 2008 and Case Study B: on Cyclone Aila 2009) in the process would examine the status of disaster management in the light of policy matrix and mechanism undertaken for disaster risk reduction in India. The overall policy matrix for disaster management brings out the challenges of disaster scenario that need to be strengthened in the context of human security and sustainable development.



## ***I. Case Study A: Kosi Flood 2008***

### **Vulnerability to flood disaster**

Floods continue to be a major natural disaster in India affecting 30-40 million people every year with annual average loss of Rs. 13,400 million (1953-1999)<sup>1</sup> and particularly the state of Bihar affecting the lives and livelihood of millions. Located in the Hindu Kush-Himalayan region, India is considered as one of the highest flood prone countries in the world. Flood to some extent is an annual experience and well-come event for many reasons for this country. But extreme floods inundates more than half of the country's landmass causing immense suffering to the human life, damages crops, properties, infrastructure and impacts the overall economic development of the country<sup>2</sup>.

India is a lower riparian country receiving huge amount of water downstream as it is situated in the Ganges-Bhramaputra-Meghna River basin system with heavy monsoon rainfall. The rivers originating in the Himalayas flow downstream to feed the Ganges system of the lower flood plains impacting Uttar Pradesh, Bihar, West Bengal, Assam and Orissa. West Bengal and Orissa is also highly impacted by coastal storm surges and cyclone that inundates the low lying coastal areas giving rise to floods in these regions<sup>3</sup>.

Associated with this is the critical problem of a large and growing population and poverty in the country. The pressure of population on national resources and fresh water availability has contributed to over dependence and over exploitation. The impact of these disasters are aggravated by the fact that still 27% of the population lives below the poverty line generation

exposure to vulnerabilities and risks associated with settlements in low lying areas and vulnerable areas that indirectly impacts sustainable development of the region<sup>4</sup>.

The following Table 6.1 projects the top ten flood prone states in India and Table 6.2 projects the average annual flood damages covering the period of 1953-1999.

**Table 6.1 Top Ten Flood Prone States in India**

<i>Top Ten Numbers</i>	<i>States</i>	<i>Million Hectare</i>
<i>1</i>	<i>Uttar Pradesh</i>	<i>734</i>
<i>2</i>	<i>Bihar</i>	<i>426</i>
<i>3</i>	<i>Punjab</i>	<i>370</i>
<i>4</i>	<i>Rajasthan</i>	<i>326</i>
<i>5</i>	<i>Assam</i>	<i>315</i>
<i>6</i>	<i>West Bengal</i>	<i>265</i>
<i>7</i>	<i>Haryana</i>	<i>235</i>
<i>8</i>	<i>Orissa</i>	<i>140</i>
<i>9</i>	<i>Andhra Pradesh</i>	<i>139</i>
<i>10</i>	<i>Gujarat</i>	<i>139</i>
<i>11</i>	<i>Kerala</i>	<i>87</i>

Source: Ref: Maps of India: [www.mapsofindia.com/top-ten/geography/india-flood.htm](http://www.mapsofindia.com/top-ten/geography/india-flood.htm). [Accessed on 20 February, 2016]

**Table 6.2 Average Annual Flood Damages (1953-1999) in India**

<i>Average Annual Flood Damage</i>	<i>Area Liable to Floods (Million Hectare)</i>
<i>Total Damage</i>	<i>Rs. 13,400 million</i>
<i>Area Affected</i>	<i>8.11 million hectare</i>
<i>Crop Area Affected</i>	<i>3.57 million hectare</i>
<i>Human Lives Lost</i>	<i>1579</i>
<i>Cattle Lost</i>	<i>95,000</i>

Source: Ref: Maps of India: [www.mapsofindia.com/top-ten/geography/india-flood.html](http://www.mapsofindia.com/top-ten/geography/india-flood.html) [Accessed on 20 February, 2016]

The factors that make India vulnerable to flood disaster are: (1) Geo-Physical Factors of Risk (2) Anthropogenic Factors of Risk. Both the factors are briefly explained below.

### ***(1) Geo –Physical Factors of Risk***

Floods are a recurrent feature in India and particularly in case of Bihar floods are inevitable events. The geophysical location topography and hydrological system allows the country to occupy one of the most fertile deltaic flood plain of the Ganga-Brahmaputra river basin system experiencing highest rainfall due to the Himalayan range. In the eastern and north eastern India, the Brahmaputra and Barak along with their tributaries drain Assam and North East States (Andhra Pradesh, Meghalaya, Mizoram, Manipur, Tripura, Nagaland and Assam) and northern portion of West Bengal. The eastern and north eastern India is flooded recurrently due to large areas of flood plain that remains submerged for several weeks extending months that causes immense damages<sup>5</sup>.

The source of the rivers that flow in India and Nepal lies in the Himalayas and melting snow during spring adds to the discharge in the rivers. Experiencing a monsoon climate, the wet season from June-September, with variation in rainfall, inadequate drainage capacity and changing course of rivers like Kosi brings extensive challenges to the institutional mechanisms of flood management in the region and India<sup>6</sup>.

### ***(2) Anthropogenic Factors of Risk***

Anthropogenic intervention in the natural environment also obstructs the flow of water over the land. Building of various structural measures for rapid economic development roads, railways and embankments to contain river water can increase the adverse impact of floods in the

Himalayan region. Rapid urbanization and deforestation and development interventions ignoring mountain specific cities has accelerated environmental degradation. Development interventions have also accelerated the pace of environmental degradation and natural disasters particularly floods in the Himalayan region<sup>7</sup>. The following table (6.3) shows the trends in flood damages in India covering the period of 2000-2008.

**Table 6.3 Trends in Flood Damages in India during the Current Period (2000-2008)**

<i>Year</i>	<i>Total area Effected (in m.ha.)</i>	<i>Cropped area (in m.ha.)</i>	<i>Population Effected (in Millions)</i>	<i>Cattle lost (Nos)</i>	<i>Human lives Lost (Nos)</i>	<i>Damages</i>
2000	5382	3580	45.01	123252	2606	268855
2001	6175	3964	26.46	32704	1444	716817
2002	7090	2194	26.32	21533	1001	762492
2003	6503	3426	34.46	16425	1864	846920
2004	8031	2693	34.21	63869	1275	1492814
2005	12,190	15.18	32.07	124930	2232	682593
2006	0.495	0.433	28.57	8932	1500	737355
2007	3.459	6.31	41.46	70650	2439	1686135
2008	0.000	1.70	19.21	17214	2143	914251

*Source: Ref: Central water Commission Annual Report 2000-2008 as mentioned in India Disaster Report II (2013) p 206*

### **Comparative Assessment of Major Floods in India**

Comparative assessment of major floods in India below shows the intensity of loss and damages incurred and its impact on the development scenario of the country. The Table 6.4 indicates that floods are major events of disasters in India. A comparison of the Kosi Floods 2008 with the flood occurrences of 2004, 2005, 2009, 2012, 2013 and 2014 reveals that 2008 floods has been the most severe in India in terms of lives affected, person and livestock perished, damage to infrastructure and development in India and particularly impacting the state of Bihar. The following table 6.4 provides a comparative assessment of major floods in India (2004-2014) in the last ten years.

**Table 6.4 Comparative Assessment of Major Floods in India during the period of 2004-2014**

<i>Name of Flood Occurrence</i>	<i>Year</i>	<i>Impact of Flood</i>
<i>Bihar Flood</i>	<i>2004</i>	<i>Affected 20 districts of Bihar, 885 people perished, 3272 animals died and 21 million people affected</i>
<i>Maharashtra Flood</i>	<i>2005</i>	<i>Mumbai City was worst hit with 1094 people died, 167 injured and 54 missing</i>
<i>Gujarat Flood</i>	<i>2005</i>	<i>The death toll was about 123 people and more than 250,000 people evacuated</i>
<i>Chennai Flood</i>	<i>2005</i>	<i>Chennai was worst hit, 50 people died</i>
<i>Bihar Flood</i>	<i>2008</i>	<i>Most disastrous flood in the 50 years history of Bihar. Affected 3.5 million people, 1 million people evacuated and 460,000 people accommodated in 360 relief camps, approx. 493 lives lost and 3,500 reported missing after the disaster</i>
<i>India Flood</i>	<i>2009</i>	<i>Affected many states of India including Orissa and North-East states, Kerala, Andhra Pradesh, Karnataka, 50 people perished in different states and one half million housed inundated</i>
<i>Laddakh Flood</i>	<i>2010</i>	<i>Most part of Laddakh suffered, damaging 71 towns and villages in Leh. At least 255 people lost their lives</i>
<i>Brahmaputra Floods (Assam and North East States)</i>	<i>2012</i>	<i>Assam and North East States was worst hit by floods, 124 people killed. Maximum environmental damage. Kaziranga National Park was worst hit with 13 great India rhinos and around 500 animals died</i>
<i>Himalayan Flash Flood</i>	<i>2012</i>	<i>The cloud burst left 31 people dead and trigger landslides and flash flood</i>
<i>Uttarakhand Flood</i>	<i>2013</i>	<i>9 districts of Uttarakhand received massive landslides and heavy rainfall due to flash floods in June 2013</i>
<i>Jammu &amp; Kashmir Flood</i>	<i>2014</i>	<i>200 people died due to flood and 350 villages inundated</i>

*Source: Ref: \*(Data compiled from various sources) 1) India Disasters Report 2011, 2012, 2013, 2014. National Disaster Management Authority, New Delhi. Available at: [http://www.ndma.gov.in/en/disaster\\_data\\_state.html](http://www.ndma.gov.in/en/disaster_data_state.html) 2) Available at [http://www.walkthroughIndia.com/lifestyles/to\\_ten\\_disasterous\\_floods\\_and\\_major\\_flood\\_prone\\_areas.in](http://www.walkthroughIndia.com/lifestyles/to_ten_disasterous_floods_and_major_flood_prone_areas.in) [Accessed on 20 February, 2016]*

### ***I. Case Study A: Kosi Flood 2008***

The case of Kosi Flood 2008 has been taken up for extensive study to understand the linkages between natural disaster and sustainable development impacting the security of the people in the light of various structural and non-structural measure taken to mitigate the flood disasters. The Kosi Flood 2008 have been considered as one of the worst flood disasters in the last 50 years in India. Since independence particularly after the devastating floods of 1954 various initiatives for flood management and flood control were undertaken to mitigate flood disasters to reduce the

vulnerabilities of the people especially the poor and the marginalized including women and children. The state of India has been moving towards a workable system of disaster management to mainstream disaster risk reduction strategies in development plans and policies. Contextually the case study of Kosi Flood 2008 has been taken up to examine the various issues associated with disaster and its management in the country.

### ***Nature and Extent of Kosi Flood 2008 (Bihar) India***

On 18<sup>th</sup> August, 2008 India (Bihar) was once again subjected to the most devastating floods experienced in the last 50 years. The Kosi flood 2008 started with a breach of Kusaha an embankment just north of the border in South Nepal. The rivers went on widening in the next few days and completely changed its course to the east leading to one of the worst flood disasters in recent history<sup>8</sup>. The floods inundated large areas of Nepal and the state of Bihar in India, affecting nearly 4 million people and immeasurable sufferings to the people in one of the most backward areas of the region, including the earlier flooding by the Ganga in the south a week before the Kosi breach in the Kosi-Baghmati belt<sup>9</sup>.

According to the Bihar Kosi Flood (2008) Needs Assessment Report 2010 the districts of Supaul, Saharsa, Madhepura, Araria and Purnea in Bihar were severely affected by the flood. A total area (approx.) 3700 sq. km. and 30% of the district area were inundated by floods, affecting 412 panchayats and 993 villages. Approximately 493 lives were lost and according to the official report 3500 people were reported missing after the devastating disaster. The flood triggered one of the largest evacuations with over 1 million people evacuated and about 460,000 people accommodated in 360 relief camps<sup>10</sup>

The preliminary estimates of losses incurred in Bihar (India) and Nepal summarized below clearly states the extreme loss and damage incurred on the Indian side due to floods following the breach of embankment on the Nepal side, the maintenance of the embankment though resides with (Bihar) India. The following Table 6.5 provides a preliminary view of the immediate loss and damages caused by Kosi Flood 2008.

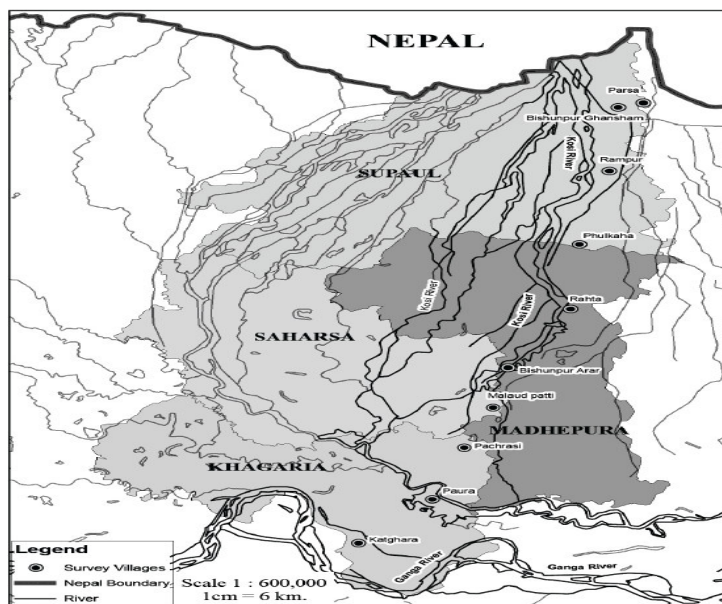
**Table 6.5 Losses due to Kusaha Breach in Indo-Nepal Region**

Country	Districts	Affected Population	Affected Family	Death	Missing	Loss of Agri Land	Road (Km)
Nepal	Sunsari	50000	7102	22	21	5592	0
India (Bihar)	Saharsa, Supaul, Araria, Madhepura, Khagaria and Purnia	3 Millions	30000	16	NA	35000	NA

Source: Dixit, Ajay. (2009) *Economic and Political Weekly* (February 7, 2009) p 71

The following Map 6.1 shows the extent of coverage of the flood 2008, Kosi (Bihar) India

**Map 6.1: The Flooded Areas of Kosi Flood 2009 (Bihar) India**



Source: Ref: Somnathan, E. and Somnathan, R. (2009) “Climate change: Challenges facing India’s Poor” *Economic and Political Weekly* Vol. XLIV. No. 31 01 August, 2009. pp 53

### ***River Kosi: The vulnerability of geo-physical location***

The eastern part of the country is drained by Kosi also known as the “Sorrow of Bihar” bringing immense hardships for the low income population of Bihar<sup>11</sup>. The Kosi known as the Sapta Kosi, (seven rivers) arises in the Terai in the Himalayan ranges of Nepal<sup>12</sup>. It is the biggest river in Nepal draining eastern part of the country, particularly the region east of Gosainthan (north of Kathmandu) and west of Kanchenjunga, a region known as the Kosi Basin. The River drains an area of 71,500 km in Tibet Nepal and north Bihar and finally draining into the Ganges<sup>13</sup>.

The River Ganges which is the main drainage system for the state of Bihar, India stretches 432 km across Bihar bisecting the state into North Bihar and South Bihar. North Bihar located north of the Ganges plain is drained by 8 major river basins (the Ghaghra, the Gandak, the Burhi Gandak, the Bagmati, the Adhwara group of rivers, the Kamala, the Kosi and Mahananda). All the rivers in North Bihar share basins either with another Indian State or with Nepal and Tibet draining into the main Ganges System<sup>14</sup>.

Rainfall occurring in the Himalayan ranges, particularly in Tibet and Nepal directly surges the flow in this river system and with the present flood management system flooding of North Bihar has become a recurrent phenomenon<sup>15</sup>. Various Central Water Commission Reports of Government of India suggests that every district in Bihar has been flooded to some degree at one time or another. No district of Bihar can claim flood free<sup>16</sup>. The following Map 6.2 shows the extent of flooding in Bihar according to the Relief and Rehabilitation Department, Government of Bihar.





block, Saharsa district, Bihar), fifth in 1984 (Jamalpur, Nauhatta block of Saharsa district, Bihar), sixth in 1991 (Joginia in Nepal) seventh in 1993 (Gandak Embankment Breach), eighth in 1993 (Bairia block, West Champaran). The Kusaha Breach (2008) that occurred in Nepal highly impacted the lower riparian country India (particularly state of Bihar) revealing the laxity in maintenance and the apathy of the state on both sides of the border<sup>21</sup>.

### ***3. Impact of Kosi Flood 2008 (Bihar) India: Social Economic and Environmental***

The impact of Kosi Flood 2008 can be examined at three levels: social, economic and environmental. At the social level the impacts were devastating in flood prone areas. According UN Office for the coordination of Humanitarian Affairs (UN OCHA) (2<sup>nd</sup> October 2008) Country Situation Report on Nepal within several days of inundation, millions of households, families were affected, houses damaged, schools destroyed and thousands of livestock and crops damaged<sup>22</sup>.

According to the OCHA Report within a month after the breach of Kosi River the 20,284 individuals of Nepali origin representing 4186 families have been displaced and 1900 families of Indian origin have also been displaced. The displaced people spread in 25 camps along the East-West Highways in Sunsari district which remained closed even after a month of the breach. In addition a 3 day bandh (27-29 September, 2008) called by The Madheshi Mukti Tiger (MMT) had hampered relief and rehabilitation work in Nepal<sup>23</sup>. On the Indian side about 3.065 million residents from 1704 villages in north Bihar were severely impacted<sup>24</sup>.

According to the official report published by the Government of Bihar the worst impacted were 5 districts of north Bihar (Madhepura, Supaul, Saharsa, Araria and Purnea). The loss of life has

been estimated at 1000 deaths which 454 dead bodies could not be recovered. The total figure of missing persons reported was 3500 persons. The Report quoted a UNDP Study (2008) that showed total 493 persons (275 men and 218 women) lost their lives in the surveyed villages due to floods. According to the report “recurrent flooding on the Kosi contributes disproportionately to India’s historical record of suffering more flood deaths than any other country except Bangladesh”<sup>25</sup>

A further analysis reveals that the level of socio-economic development in Bihar is low compared to other states of India, which is a clear indication of risk and vulnerability scenario for the people of the state. Bihar is considered as the most flood prone state of India besides being a low income, low human development state of India. According to data available out of the total flood risk area of India 16.5% and 22.1% of flood risk population lives in Bihar. About 73% of the state’s (Bihar) total geographical area is at risk from perennial flood as well as risks comes from being in the earthquake vulnerable region falling in the earthquake seismic zone (seismic zone IV and V)<sup>26</sup>.

About 76% of the population of north Bihar lives with the recurring risk of floods. In case of Bihar the history of floods shows that recurrent floods have accounted for thousand of human lives and livestock deaths, missing, and assets worth millions wiped out<sup>27</sup>. A study on impact of disaster concentrating on Kosi Flood 2008 based on survey of 10 villages impacted by the flood in North Bihar shows that a total of 4614 household surveyed, several indicators confirmed their overall poverty. Many villages reported no education and agricultural labour as primary occupation. A high percentage of families were reported to be the beneficiaries of various state sponsored poverty programmes that exhibited considerable error<sup>28</sup>.

Disasters as such reflect major challenges faced by India's poor. Access to food was a major problem, as crops destroyed adding to the woes of women and the household with houses fully and partially damaged, schools being used as emergency shelters for homeless people affected, the education of the children, low savings, low income groups and communities suffered the most. People living on the margins and very poor very severely impacted by the floods<sup>29</sup>.

The economic impact of Flood 2008 was most severe causing extensive damage to the infrastructures (roads, bridges, railways, embankments and the irrigation system). The Kosi barrage faced extensive damage due to flood. Extensive structural damage was caused to irrigation and flood protection infrastructure including the Kosi Barrage. More than 6 meter of the Main Eastern Kosi Canal was fully damaged, 3 km of the branch was fully damaged and 1 km of the barrage partially damaged<sup>30</sup>.

The Bihar Kosi Flood (2008) Needs Assessment Report estimated 236,632 houses fully or partially destroyed in all the five districts affected by floods. The estimated damage was Rs. 5,935 millions / US \$ 134.9 million. About 1800 km of roads and 1100 bridges and culverts were destroyed in floods with maximum damages in the Saupaul, Madhepura and Saharsa districts of Bihar<sup>30</sup>. The agricultural sector was severely damaged. Over 350,000 acres of paddy and 258,000 acres of other crops were damaged impacting approx. 500,000 / 5 million farmers. Even a large amount of livestock estimated to 15,500 perished in the disaster<sup>31</sup>.

The population of Bihar particularly 90% of the flood affected population was dependent on agriculture which was affected. The worst impacted 5 district (Madhepura, Supaul, Saharsa, Araria and Purnea) of Bihar due to Kosi Flood 2008 saw an overwhelmed 1000 sq. km (247,000

acres) of farm land and standing crop destroyed. The total crop damage has been estimated at Rs. 8 billion for the five districts<sup>32</sup>.

Socio-economically, the flood affected population is highly vulnerable communities with low human and economic development indicators and relatively low coping capacities. Poverty in Bihar is 42% compared with overall India poverty rate of 28% and rural poverty was 45% (Bihar) in 2004, the second highest after Orissa<sup>33</sup>. In 2008 agriculture accounted for 35%, industry 9% and service 55% of the economy of the state of Bihar with manufacturing sector performing badly during the period of 2002-2007<sup>34</sup>.

There exists a sharp rural–urban divide as well as north-south divide in income distribution in the state of Bihar. The southern districts of Bihar (Patna, Munger and Begusarai) have far largest income profiles than the districts of north Bihar which also suffers from recurrent and chronic flood disasters. In spite of rise in individual income, 30.6% of Bihar's population lives below poverty line compared to all India figure of 22.15%. The level of urbanization is also low compared to all India level<sup>35</sup>. The socio-economic indicators points out that Bihar requires long term measures to reduce vulnerability and risk factors associated with disasters to bring sustainable development and human security.

The environmental impact can be accessed from fact that almost 76% of the land was submerged due to floods destroying 2, 47, 000 acres of crop land. About 273,000 acres arable land has been rendered fallow due to sand casting with long term implications for environment agriculture and livelihood. Floods also caused breakdown of embankments, soil erosion, sand casting, water logging, water contamination, lack of access of clean water, outbreak of water borne diseases causing serious health issues<sup>36</sup>.

Deforestation in the upper Himalayan ranges results into large amount of silt deposition in the catchment mountain system. The total catchment area of Kosi is 74,030 sq. km. excluding its two important tributaries the Kamala (7232 sq. km.) and Bagmati (14,384 sq. km.) Deforestation in the catchment area as is estimated further exacerbates the situation<sup>37</sup>. Further due to progressive siltation Kosi river bed is higher than adjacent lands as a result of embankments. This situation creates high land and low lands separated by embankment.

The resultant scenario shows that low lands have become permanent water locked. Sixteen percent (16%) of the land mass of north Bihar which is the most flood prone suffers from permanent water logging<sup>38</sup>. Human intervention in the Kosi basin (both in Bihar and Nepal) have impacted in sediment load and accelerated erosion in the upper watershed due to deforestation and development works. The following Table 6.6 presents the key environmental damages due to Kosi Flood 2008.

**Table 6.6: Key Environmental Damages: Kosi Flood 2008**

<i>Type of Impact</i>	<i>Severity</i>	<i>Extent</i>	<i>Recovery</i>	<i>Cost</i>
<b><i>A. Physical/ Natural Environment</i></b>				
<i>i. Sand Casting</i>	<i>Very Severe</i>	<i>Extensive</i>	<i>Long Term</i>	<i>Very High</i>
<i>ii. Soil Erosion/Destabilization</i>	<i>Severe</i>	<i>Extensive</i>	<i>Long Term</i>	<i>High</i>
<i>iii. Sedimentation of Water Bodies</i>	<i>Moderate</i>	<i>Extensive</i>	<i>Long Term</i>	
<i>iv. Wasting of debris into land water</i>	<i>Low</i>	<i>Local</i>	<i>Medium</i>	<i>Moderate</i>
<i>v. Water Contamination</i>	<i>Moderate</i>	<i>Local</i>	<i>Medium</i>	<i>Moderate</i>
<b><i>B. Biological / Social Environment</i></b>				
<i>Impact on Human Health</i>	<i>Very Severe</i>	<i>Extensive</i>	<i>Medium</i>	<i>High</i>
<i>Loss/damage of vegetation cover</i>	<i>Moderate</i>	<i>Moderate</i>	<i>Medium</i>	<i>Moderate</i>
<i>Impact of livestock</i>	<i>Severe</i>	<i>Extensive</i>	<i>Medium</i>	<i>High</i>

*Source: Government of Bihar, Kosi Flood 2008: Needs Assessment Report, June, 2010. Government of Bihar, World Bank, GFDRR [ Accessed on 05 May 2016at 4.10 p.m.] pp 44*

An analysis of Bihar Kosi Flood (2008) Needs Assessment Report brings out the key indicators of damage reported affecting all the sectors and lives of the people in (Bihar) India. The following Table 6.7 presents the loss and damage incurred during Kosi Flood 2008.

**Table 6.7: Kosi Flood 2008: Damage and Loss Assessment of the Flood**

<b>Flood Impact</b>	<b>18<sup>th</sup> August, 2008</b>
<b>Total Affected Districts</b>	<b>5</b>
<b>No. of affected Villages</b>	<b>993</b>
<b>No. of Affected Panchayats</b>	<b>412</b>
<b>Total Area Affected in sq. km.</b>	<b>3700 sq. km.</b>
<b>Lives Lost</b>	<b>493</b>
<b>People Missing</b>	<b>3500</b>
<b>Affected Population</b>	<b>3.5 million</b>
<b>Houses destroyed fully</b>	<b>157,428. 67% completely destroyed</b>
<b>Houses damaged partially</b>	<b>85,355 partially damaged and estimated cost of damage 134.5 US \$</b>
<b>No. of livestock perished</b>	<b>15,500(10,000 milk animals, 3000 drought animals, 2500 small animal perished</b>
<b>Crops destroyed</b>	<b>350,000 acres of paddy, 18,000 acres of maize and 240,000 acres of other crops</b>
<b>No. of farmers Impacted</b>	<b>5,00,000</b>
<b>No. of schools affected</b>	<b>1540</b>
<b>Health Damages</b>	<b>171 partially affected units, 11 pregnant mothers perished</b>
<b>No. of people in Relief Camps</b>	<b>460,000</b>
<b>No. of relief camps</b>	<b>360</b>

*Source: Ref: Source: Government of Bihar, Kosi Flood 2008: Needs Assessment Report, June, 2010. Government of Bihar, World Bank, GFDRR [ Accessed on 05 May 2016at 4.10 p.m.) ( Data compiled by the researcher from the Report] pp 11-44*

### ***Disaster Management and Mitigation Strategies in India: Floods***

In the context of Kosi flood (Bihar) 2008 the overall policy initiatives, strategies and mechanisms would be examined to bring out a clear understanding on flood management policies adopted by India since independence. Floods continue to be a major hazard in India and management of floods has been the major pre-occupation of the people and the state of India.

To mitigate the impacts of floods various policy matrix had been developed and implemented to better equip the country to deal with floods. During the last seventy years, the country has

adopted and evolved continuously flood management strategies, mechanisms and policies both structural and non-structural in nature to mitigate the vulnerabilities and risks associated with floods generating mixed experiences and reactions.

The initial response of the government was to adopt various structural measures by emphasizing the implementation of large scale flood control, drainage and irrigation projects comprised of flood control programmes, flood embankments, levees, tidal sluice gates on rivers, drainage channel improvements, drainage structures, multipurpose big dams and barrages, pumping systems for irrigation purposes. Non-structural measures such as national disaster management policy, flood forecasting and warning, cyclone warning, flood proofing, flood zoning, flood shelters, emergency preparedness and flood insurance though still very weak in India were later incorporated as structural measures alone could not mitigate flood problems<sup>39</sup>.

The strategies, policies and mechanisms adopted for flood management in the context of India could be categorized into three phases.

A) The First Phase-Pre Independent Phase- Followed Till 1950s

B) The Second Phase-Post Independent Phase 1950s-1990s

C) The Third Phase-Current Phase 2000s onwards [the phase of disaster management]

The *first phase* or pre-independent phase was generally guided and coordinated by the policies formulated by the colonial Government of India since the country was under the British rule till 1947. Initially famines were the major concern of the colonial rulers rather than flood disaster. The colonial rule was more interested in providing irrigation facilities so that agricultural



revenue was not hampered and expenditure on famine relief could be avoided. Flood Policy in colonial India was more in the nature of relief and relief work on adhoc basis<sup>40</sup>.

To examine flood management strategies in the context of India with particular reference to Kosi reveals that the initial strategy during the colonial period in the late 19<sup>th</sup> century was construction of marginal embankments, river training in lower reaches and a series of barrages and canals instead of large scale embankments and high dams. The famous Calcutta Conference (1896- 97) concluded against any major flood control measure except short embankments<sup>41</sup>.

In 1927 the colonial government for the first time appointed the Orissa Flood Committee as considerable damage from floods had occurred in Baitarani, Brahmini and Mahanadi rivers. The Committee was constituted to inquire into the nature and causes of these floods to propose corrective measures. To systematically examine the issue of floods and mitigate flood related damages Patna Conference on Floods was called upon in 1937 to examine flood hazard in Bihar river Basin and propose flood control measures. In 1943 an Inquiry Commission was also set up to study the flood disaster in the Damodar River<sup>42</sup>.

Both the conferences and the inquiry commission were not in favour of embankment policy. Even the then chief engineer in the Patna Flood Conference G. F. Hall noted that “embankments give rise to false sense of security”. Later investigations also highlighted the movement of Kosi River and suggested detailed investigation of the topography and hydrology of Kosi River before finalizing any scheme. Till 1953 the same policy was followed with no definitive action being taken and no detailed investigation followed to propose flood control measures<sup>43</sup>.

Successive floods followed and the policy of piecemeal measures was not adequate enough in containing the floods. The catastrophic flood in 1953-54 saw a paradigm shift in independent India regarding flood policy with a change. This policy was targeted towards “flood control” which began to be pursued vigorously to control the damaging impact of flood disaster.

The *second phase* saw the implementation of first the National Flood Policy formulated in 1954 relying heavily on structural measures consisting of a combination of embankments, detention basins, improvements and construction of drainage channels along with anti-erosion and river training works emphasizing on flood protection work to be taken in a systematic and planned manner. On the basis of the National Flood Policy the Kosi project was formulated in 1954 based on the Kosi Treaty (signed on 25 April 1954 and revised on 19 December 1966) primarily aimed at flood control and providing irrigational facilities to increase agricultural productivity in the region. The embankment was built to provide protection to 2800sq km of land in north Bihar and Nepal from floods<sup>44</sup>.

In 1954, when the Bihar flood policy was first introduced, Bihar had approximately 160 km of embankments. At that time, the flood-prone area in the state was estimated to be 2.5 million hectares. Upon the completion of the system of embankments, 3,465 km of such structures had been constructed. However, the amount of flood-prone land increased to 6.89 million hectares by 2004. India has built over 3000 km of embankments in Bihar over the last few decades<sup>45</sup>.

Contextually analyzing the above scenario brings out the fact that flooding propensity has increased by 2.5 times during the same time period. Close to 86 percent of the state’s embankments (2952 km) are in north Bihar. Their purpose was to protect 61 percent of the flood prone areas in Bihar. However in actuality, the rivers that have been embanked, (including the

Kosi) have reduced channel capacity due to increased siltation which, in turn, has resulted in more frequent and severe floods from infrastructure-related measures<sup>46</sup>.

Several empirical evidences have shown instances of breaches in the embankments have continued in the region. In addition the adverse effect of the Kosi Project has been noted with instances of drainage congestion, water logging, rise of river bed level and reduction in crop productivity due to siltation of the floodplains. This has resulted in low crop production, loss to farmers and a negative impact on the livelihood of the people trapped in between<sup>47</sup>.

The present embankment system has not achieved its stated purpose and flooding problems have been aggravated due to the construction of barrage in the upstream region. Dipak Gyawali pointed out that there has been a ten- fold increase of embankment construction in India (Bihar). This strategy is guided not by hydrological principles but rather by political compulsions. Structural measures have not brought any respite from flood disaster so far considered significant mechanism to deal with disaster in the worst affected region of India due to floods<sup>48</sup>.

Analysis of the above approach draws attention to the factual position that a combination of measures had been undertaken to address flood disaster but ultimately high dams and embankments continued to dominate the subsequent period of flood control. The structural measures are still considered the foremost policy stance to be followed till date in addition to “calamity relief fund” generated for relief and rehabilitation of the people impacted by disasters in India.

The *current phase* 2000s onwards reflects the change in perception regarding water management and flood control emphasizing on both, structural and non- structural methods of flood

management with specific importance given to public participation and role of various stakeholders strongly emphasizing a change in policy from the earlier traditional bias towards structural mitigation of floods towards a more integrated approach<sup>49</sup>.

The Central Water Commission (CWC), working under the Ministry of Water Resources, presently known as the Ministry of Water Resources and Ganga Rejuvenation is the apex technical organization in the country for development of water resources. To pursue the objective of integrated water resource management the CWC works for macro-level water resources planning and management in India. It is the central coordinating body for the water sector and acts as planning and policy formulation, investigation, appraisal, design construction of projects for development of water resources, monitoring and wing management of projects, hydrological observations and flood forecasting. The Commission is responsible for initiating, coordinating and furthering, in consultation with the State Governments, schemes for control, conservation, development and utilization of water resources throughout the country for the purpose of irrigation, flood management, power generation, navigation and other water related activities<sup>50</sup>.

Tenth plan (2002-2007) onwards the Ministry of Water Resources working through the Central Water Commission proposed a range of structural and non-structural measures to deal with flooding. It also reflected the change in approach towards water sector management by taking into consideration the strategy to promote water resource planning with more attention to environmental considerations<sup>51</sup>.

The evolution of an integrated approach towards flood mitigation lies in the policy actions developed in the 1980s when the Rashtriya Barh Ayog (RBA) or National Flood Commission of India was established in 1976 to evolve a coordinated, integrated and scientific approach to flood

management. The main task was to address flood control problems and make assessment of flood prone areas in the country<sup>52</sup>.

The Rashtriya Barh Ayog or National Flood Commission assessed in 1980s that an area of about 40 million hectares is prone to floods in the country. Out of the total flood prone areas about 32 million hectares could be provided with protection. To protect the remaining area from flood, importance must be given to non-structural measures such as flood plain zoning, flood proofing and flood forecasting techniques<sup>53</sup>.

It must be noted that already the Ganga Flood Control Commission (GFCC) was established in 1972 with its head quarter at Patna, Bihar to address the flood disaster in the eastern region of India along the Ganges flood plain. The GFCC serves as the executive branch of the Ganga Flood Control Board (GFCB) which is headed by the Union Minister of Water Resources with Ministers of Finance, Railways, Surface Transport and Agriculture and the Member Planning Commission among members of the GFCB Board. The Commission has been assigned the task of preparing comprehensive plans for flood management of the river systems in the Ganga basin and providing technical guidance to the Basin States on flood management particularly monitoring the Kosi River basin system within the state of Bihar acting as the nodal institutional mechanism to deal with the maintenance of Kosi dam upstream in Nepal<sup>54</sup>.

The strategy also identified the need for a National Water Policy that was prepared by Ministry of Water Resources and adopted in 1987 reviewed and updated again in 2002 and 2012. Based on the principles of integrated water resource management it also emphasized the issue of participatory role of the people and other stakeholders to preserve and protect the environment and water resources. The principle of integrated water resource management required the

protection, restoration, and preservation of the environment and its biodiversity including national forests, and the water quality<sup>55</sup>.

According to the Report of the Working Group (2011) on Flood Management and Region Specific Issues for 12<sup>th</sup> Plan flood mitigation measures requires both structural and non-structural measures methods for flood control. Structural measures should be planned and implemented by the state governments and most of the non structural measures to be formulated at the central level in consultations with the states<sup>56</sup>.

According to the above Report (2011) several floods in the past and recent floods in many states including Andhra Pradesh, Bihar, Uttar Pradesh, Assam, West Bengal and Odisha have caused much devastation and large submergence reminding about the inadequacy of flood management measures. Even the current level of flood forecasting infrastructure is inadequate. The Central Water Commission has only 175 stations and this does not cover many smaller rivers that cause substantial floods in the country.

Besides this other challenges to flood management in India arise out of the fact that many rivers are trans-boundary in nature that requires negotiations at bi-lateral and international level. Highlighting the limitations the Ministry of Water Resources has insisted that flood control is also an international responsibility since fifty-nine (59 %) of the river flow in the country is received by international rivers<sup>57</sup>.

The sharing of the Ganges water and the Farakka barrage dispute comes under the preview of Indo-Bangladesh Treaty of Cooperation and Friendship 1972. Similarly the Kosi barrage is situated in upstream Nepal but maintained under the Kosi Treaty of 1954 (and revised in 1966) by the state of Bihar, India comes within the ambit of inter-territorial matters it had to be dealt on a bilateral basis and more internal measures were sought after to deal with the chronic flood

problem. The national governments, the state governments and other related institutional mechanisms must collaborate to generate early warning systems for such rivers. Information sharing with downstream organizations is required but is not practiced vigorously<sup>58</sup>.

Recently the Indian government has been engaging itself in developing the project to interlink the rivers (ILR). Under this project, both the Himalayan rivers and the peninsular rivers would be connected among themselves. The basic rationale behind the project is that some river basins are surplus in water while others are in deficit and this could in some extent be a solution to flood related disasters. The river Inter-Linking Project is the largest river intervention project ever conceived that involves inter-linking within the territorial boundaries. At the same time this involves rivers that are transboundary and has the potentials to affect the co-riparian countries including Bangladesh, India, and Nepal<sup>59</sup>.

The project has gathered serious reservations from various stakeholders be it scholars, academics or members of civil society. Himanshu Thakkar argues that ILR could be a major policy disaster because the project is inherently flawed based on surplus and deficit issue, raising serious questions about the feasibility and desirability of the project. Moreover with the challenge of global warming looming large water availability in these basins may be affected<sup>60</sup>.

Flood mitigation effects do come under fiscal and economic heads under the planning and disbursement section because of its special importance. As such the ILR involves huge amount of financial expenditure and the financial feasibility of the project has come under scanner. Bandopadhaya and Parveen are engaged in a detailed discussion on the economic and environmental feasibility of ILR<sup>61</sup>.

Similarly R. R. Iyer has rightly pointed out that the developmental goals particularly how those goals are to be achieved be better left to the administrative and legislative branches of the

government. Assuming that the Supreme Court had to make development intervention the issue of interlinking of rivers has generated more controversy and earned less appreciation<sup>62</sup>.

Medha Patkar has also pointed out that flood mitigation through large dams are often not feasible as they are a symptom of the larger failure of the unjust and destructive dominant development model and social mobilization of a larger scale is required to bring about a change in the development model. As such a peoples' movement advocating the ecological approach to rivers has already emerged in various countries of South Asia that advocates the right of the river to flow without any artificial obstruction<sup>63</sup>.

The Supreme Court judgement of 27 February 2012 had directed the Government of India to implement the ILR project through a special committee that would take precedence of all other administrative bodies. The Ministry of Water Resources recently constituted a committee, named "Special Committee on Interlinking of Rivers" on 23rd September, 2014 to develop alternative solutions for water insecurity and flood management in the country<sup>64</sup>. This judgement of the Supreme Court is a "disquieting judgement"<sup>65</sup> enough to cause anxiety and tension among experts, scholars and activists as the rationale behind the project is flood mitigation and drought relief which is envisioned as taking water from surplus area to deficit area is naturally unrealistic. Moreover the past six decades experience has shown particularly in the case of Bihar that river and flood control has been a big failure<sup>66</sup>.

An exploration of data based on Water and Related Statistics Report 2015 indicated that inspite of flood policy and flood control measures during the last sixty –five years, the trend is on the increase. The trend is even more pronounced from 1970s onwards when large population is being subjected to increasing flood prone areas. According to the First Five Year Plan Document (1951-56) the flood prone area was only 2.29 million hectares that rose to 31.58 million hectares



in 2013. The damage to crops was wide range varying from Rs.5.87 crore in 1965 to Rs. 7307.23 crore in 2003<sup>67</sup>.

The floods also caused damage to crops worth Rs 3214.99 crore in 2013. In addition, there was a great loss of human lives and livestock often affecting the poor strata of the population. The total damage caused by floods is estimated to the tune of Rs.11095.14 crore during 2013. The expenditure in XI Plan has increased significantly by more than 159% as compared to the X Plan while the increase in X Plan as compared to IX Plan was about 49%. Upto the Xth plan expenditure on flood management was Rs 14280.75 crores<sup>68</sup>.

The following table 6.8 projects the flood damages incurred from the first plan period (1951-1956) till the eleventh plan period (2007-2012)

**Table 6.8 Flood Damages from First Plan Period (1951-1956) till Eleventh Plan Period (2007-2012), India**

<i>Plan</i>	<i>Plan Period</i>	<i>Total Damages To Crops Houses And Public Utilities (Rs Crores)</i>
<i>First Plan</i>	<i>1951-1956</i>	<i>13959.00</i>
<i>Second Plan</i>	<i>1956-1961</i>	<i>15259.60</i>
<i>Third Plan</i>	<i>1961-1966</i>	<i>11098.90</i>
<i>Annual Plans</i>	<i>1966-1969</i>	<i>14387.70</i>
<i>Fourth Plan</i>	<i>1969-1974</i>	<i>53,445.60</i>
<i>Fifth Plan</i>	<i>1974-1978</i>	<i>49,748.80</i>
<i>Annual Plans</i>	<i>1978-1980</i>	<i>30,476.80</i>
<i>Sixth Plan</i>	<i>1980-1985</i>	<i>76,603.60</i>
<i>Seventh Plan</i>	<i>1985-1990</i>	<i>124,100.90</i>
<i>Annual Plans</i>	<i>1990-1992</i>	<i>16788.00</i>
<i>Eighth Plan</i>	<i>1992-1997</i>	<i>26,236.60</i>
<i>Ninth Plan</i>	<i>1997-2002</i>	<i>31,021.98</i>
<i>Tenth Plan</i>	<i>2002-2007</i>	<i>55,154.52</i>
<i>Eleventh Plan</i>	<i>2007-2012</i>	<i>80,464.83</i>
<i>Twelfth Plan</i>	<i>2013</i>	<i>11095.14</i>

*Source: Ref: (Data Compiled From The Central Water Commission, India: Water And Related Statistics Report 2015.) Central Water Commission (2015) Water And Related Statistics Report 2015. Water Resources Information System Directorate Information System Organization Water Planning & Projects Wing Central Water Commission April 2015 [Accessed on 10 May 2016 at 4.58 p.m.] pp 150-151*

The trend in flood damages further indicated a shift in spread affect of flood prone areas. Besides the GBM river basin system floods have spread to several states in recent past. The distribution of damage has been wide spread with the worst hit states being Assam, Orissa, Bihar and West Bengal In the east, Maharashtra, Gujarat and Rajasthan In the west and Andhra Pradesh, Karnataka Kerala and Tamil Nadu in the south. The data clearly indicates that from the normally impacted Gangetic belt floods have spread to other parts of India<sup>69</sup>.

According to the data provided by the Central Water Commission, Water And Related Statistics Report 2015 the expenditure on flood management during XI Plan, it is found that the maximum expenditure was incurred in the State of Bihar followed by Uttar Pradesh, Assam and the North – Eastern states, Andhra Pradesh, West Bengal, Orissa, Gujarat, Haryana and Manipur. These States accounted for around 79% of total expenditure on Flood Management during XI Plan<sup>70</sup>. The following table 6.9 projects the expenditure on flood management showing the contribution of selected states during the ninth, tenth and eleventh plan period.

**Table 6.9 Expenditure on Flood Management: Contribution of Selected States during IX, X, And XI Plan Period, India**

<i>States</i>	<i>IX Plan 1997-2002</i>	<i>X Plan 2002-2007</i>	<i>XI Plan 2007-2012</i>	<i>Total Rs Crores</i>
<i>Bihar</i>	<i>316.98</i>	<i>474.37</i>	<i>2186.08</i>	<i>2977.43</i>
<i>Uttar Pradesh</i>	<i>139.88</i>	<i>909.64</i>	<i>1533.13</i>	<i>2582.65</i>
<i>Assam</i>	<i>73.66</i>	<i>136.79</i>	<i>1310.49</i>	<i>1520.94</i>
<i>Andhra Pradesh</i>	<i>214.64</i>	<i>255.04</i>	<i>1209.08</i>	<i>1678.76</i>
<i>West Bengal</i>	<i>653.69</i>	<i>418.89</i>	<i>696.88</i>	<i>1769.46</i>
<i>Orissa</i>	<i>53.50</i>	<i>15.39</i>	<i>601.33</i>	<i>670.22</i>
<i>Gujarat</i>	<i>15.60</i>	<i>7.76</i>	<i>530.01</i>	<i>553.37</i>
<i>Haryana</i>	<i>93.62</i>	<i>252.56</i>	<i>442.43</i>	<i>788.61</i>
<i>Manipur</i>	<i>32.14</i>	<i>48.55</i>	<i>393.86</i>	<i>474.55</i>

*Source: Ref: Central Water Commission (2015) Water And Related Statistics Report 2015. Water Resources Information System Directorate Information System Organization Water Planning & Projects Wing Central Water Commission April 2015 [Accessed on 10 May, 2016 at 4.58 p.m.] pp 24*

The revised National Water Policy 2012 has further identified “climate change” as an important challenge for India in addition to the existing challenges that requires integrated water resource management policies. The objective of the policy was to take cognizance of the existing situations, to propose a National Framework of Law, for creation of a system of laws and institutions and for a plan of action with a unified national perspective The federating States could pursue State Water Policies drafted or revised in accordance with this policy keeping within the principles of a unified national perspective<sup>71</sup>.

Under the Twelfth Plan (2012-2017) flood management has been identified as a major area of mitigation of disaster risks in India. According to the 12<sup>th</sup> plan 39 districts have been identified as chronologically flood prone. The factor contributing to increasing flood damages has been identified and attributed to indiscriminate development and encroach of flood prone areas, improper planning and in construction of road and railways in risk zones and inadequate drainage systems<sup>72</sup>.

Under the Twelfth Plan for prevention and mitigation of disasters including flood disasters and for undertaking a holistic, coordinated and prompt response to any disaster situation, the Government of India has set up a National Disaster Management Authority (NDMA) in 2005 to lay down policies on disaster management. The NDMA under the Twelfth Plan in plan period would also develop multipurpose flood shelters under the national flood risk management programme in convergence with other related project<sup>73</sup>.

### ***Disaster Management and Kosi Flood 2008***

Drawing heavily on the above discussion it could be stated that disaster management in India has always been a costly affair. Flood control measures are viewed skeptically because of the highly

expensive nature of the huge projects promoted and funded by various aid agencies to control river water. But these measures have not been able to save India from disastrous floods, whose frequency has increased over the years with no integrated disaster management policy till the tenth plan period developed to protect people from unprepared disasters. Earlier floods, the Kosi flood 2008 and subsequent floods are a case to the point.

Disaster management requires strengthening of disaster preparedness and disaster risk reduction strategies. To mitigate the disastrous impact of flood disasters structural measures are not adequate. It also requires the non-structural measures particularly the various legal and institutional mechanisms and preparedness measures such as flood forecasting and warning to be incorporated and implemented for proper response.

According to the Bihar Kosi Flood (2008) Needs Assessment Report 2010 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. An extensive evacuation operation was undertaken to bring approximately 1 million evacuees to safety.

The immediate “response” of the government was to provide “relief” operations with policy initiative for food security. The Report (2008) expressed great concern that the floods might push a large number of the poorest families deeper into poverty which required targeted assistance including food relief, support to agriculture employment opportunities, micro-credit and financial assistance to rebuild their homes, employment generation. Various stakeholders, international and national NGOs were involved in food relief distribution<sup>75</sup>.

The institutional capacity of the State government to manage the disaster was particularly challenged with the preceding large-scale flood of 2007 followed by the Kosi floods of 2008. In spite of setting up the Bihar State Disaster Management Authority on 6<sup>th</sup> November 2007<sup>76</sup> under section 14 (1) of the Disaster Management act 2005 and adopting the Bihar State Disaster Management Policy in 2007 to strengthen the institutional capacity for disaster risk reduction in the state<sup>77</sup> management of disaster was at its weakest level.

The local and state government structures were not fully prepared for such a level of disaster. The recovery from these two consecutive disasters had stretched public infrastructure, public services, and fiscal resources beyond limits. The five districts affected by the flood were among the least developed even before the 2008 flood. Available district-level indicators show that they lagged behind the state as a whole that created the vulnerability scenario for such a large scale disaster<sup>78</sup>.

The Report recommended that the country needs to improve disaster response and preparedness at local levels capacity building must be engaged into the district and local level administration with provision of immediate rescue resources, emergency funding mechanisms, with better information management and contingency planning. In the long run more emphasis is required on mitigating and managing future flood disasters to reduce the increasing vulnerability of the people through proper development programmes<sup>79</sup>

The Kosi 2008 flood disaster called upon the setting up of a judicial commission to probe Kosi embankment breach that caused worst floods in the last fifty years. The state government under Chief Minister Nitish Kumar appointed the Justice (Rajesh) Walia Commission in September 2008 due to political pressure created by the opposition, members of the community impacted by

the floods and various other stakeholders including members of civil society and non-governmental organization to investigate the cause of the breach<sup>80</sup>. The commission was supposed to table its report within six months. The commission submitted its report in March 2014 to the state government nearly six years after it was set up. The report is yet to be made public with the victims still awaiting rehabilitation as thousand acres of cultivable land is still covered with sand in the Kosi region<sup>81</sup>.

An analysis of the mechanisms adopted so far to manage flood control marks the failure of conventional ways of controlling floods in India. The Kosi embankment breach in Nepal with disastrous impact on India cogently as Ajay Dixit points to a major flaw in the conventional approach pursued towards river flow and flood control mechanisms practiced through all these decades.

There needs to be a paradigm shift in responding to the risks of floods. This paradigm shift suggests Dixit can work at two levels—(a) the approaches towards flood mitigation that combine flood adapted structural elements with open basin systems of river drainage that can adapt to flooding in future with uncertainties of climate change looming large and (b) secondly this shift could contribute towards building social resilience by improving access to core services including drinking water supply, reliable energy, health services and empowering women combined to form the cornerstone of this paradigm shift on flood management<sup>82</sup>.

In a similar vein scholars Rashmi Kiran Shrestha and others in the case study of kosi flood 2008 has highlighted two key issues relating to flood control—(a) first is the failure of structural approach to flood control and second is institutional dysfunction with respect to the trans-boundary flood management. The institutional weakness that brought forward the challenges

highlighted the trans-boundary politics of maintenance and non-communication between governmental decisions on both sides of the border<sup>83</sup>.

The decision making bodies of Government of Bihar, India and Government of Nepal as the Kosi High Level Committee (KHLC) under the chairmanship of Ganga Flood Control Commission (GFCC) in Patna, is responsible for monitoring the protection work carried under Kosi Project. The internal politics of Nepal was also focused on peace agreement with the Maoists to bring them to mainstream politics that nearly overlooked the matter of joint monitoring that the embankments were defunct and need strengthening after the 2007 monsoon. Thus it reflected the unpreparedness of institutional mechanisms to disasters<sup>84</sup>.

The trans- boundary dimension of river Kosi has further created major challenges for India and Nepal. The provisions of the Kosi Treaty of 1966 entrusts the main responsibility of maintaining the Kosi project with Government of Bihar (India) whereas the upstream stake holder Government of Nepal providing only additional infrastructural support in the operation and management of the Kosi barrage.

The major rivers are prone to flooding in South Asia and are cross border in nature which makes the “blame game” on both sides of the border convenient. Kosi being transborder in nature the problem of mistrust arise between upstream Nepal and downstream India with management powers residing with the State of Bihar, India<sup>85</sup>.

Mismanagement of communication on both sides of the border, coordination and failure of governance has been major factors cited for embankment breach. Institutional dysfunction and governance deficit are cited as the major causes of the breach. In this context Himanshu Thakkar has highlighted the Kosi embankment breach as the result of negligence of duty and lack of

accountability at different levels of governance reflecting in the institutional dysfunctionality and governance deficit that allowed the flood to happen<sup>86</sup>. D .K. Mishra in particular had been very skeptical of the functioning of institutions related to the monitoring of Kosi river embankments and timely repair of the breaches could have been prevented by institutions responsible for it having performed their duty properly. Bihar floods are a recurrent feature and the inevitable has happened due to dereliction of duty by the respective institutions from both sides of the border (Nepal and India) <sup>87</sup>.

The inherent weakness of the Kosi Treaty has made the Kosi project lack institutional capacity especially designed for to control floods in the region and strengthen disaster preparedness and mitigation efforts. As a result it could be suggested that the disaster management aspect needs to be mainstreamed within the Kosi Treaty for the Kosi river and its tributaries to reduce disaster risks in the Kosi –Gandak-Baghmati belt of north Bihar, India. The Kosi flood 2008 has once again highlighted the fact that flood management strategies in India are questionable and our preparedness level to face such events are far too inadequate<sup>88</sup>.

### ***Disaster Management: The Current Status: Bihar: India***

At present many states in India are moving towards a working system of disaster management by mainstreaming disaster preparedness and mitigation in various plans and policies. According to Section 23 (1) of Disaster Management Act “there shall be a plan for disaster management for every state to be called State Disaster Management Plan” (SDMP) Bihar government in compliance with the provisions of the Disaster Management Act has formulated the Bihar State Disaster Management Plan” (BSDMP) which was approved by the State Cabinet of Bihar in 2014 to properly address disaster management in the state<sup>89</sup>.



Currently the Government of Bihar and the Bihar State Disaster Management Authority has started changing the strategy regarding disasters and particularly flood management with a shift in paradigm from relief and response to preparedness and mitigation to address the issue of disasters in the state<sup>90</sup>. The current strategy besides the traditional mechanisms of embankments and high dam projects is putting more emphasis on rehabilitation and reviving traditional and natural drainage system, substituting the policy of building more embankments with smaller projects for river flow and drainage and small storage capacities and avoiding further breaches of the dams that brings immense devastation and miseries to the people and particularly to the people of north Bihar<sup>91</sup>. The main hurdle however remains regarding coordination among various related departments of the Bihar government associated with mainstreaming and implementing disaster management plans and policies to reduce disaster risks and building resilience of the communities impacted by disasters<sup>92</sup>.

Alternative strategies for flood control and mitigation has to be brought to the forefront. This entails reviving traditional system of flood management and connected water channels that have been forgotten in modern India. Floods are inevitable but flood management is poor in India due to mismanagement of water resources. Climate change is increasing the frequency of extreme weather making the country more vulnerable to disasters. Channelizing rain water and holding in small catchment areas must be safeguarded as these are going to be “temples of modern India”<sup>93</sup>.

Living with floods is a way of life in the GBM Basin. As most of the modern flood control technologies have their own limitations and less people-friendly the focus should be the use of flood waters in the best possible way that ensures the least damage. The right of the river must be respected. It is the “natural right of every river to flow”. The best possible solution for floods

would be to avoid drainage constriction, desiltation of the river and ensure easy flow of the river instead of being waterlogged in productive agricultural land and avoid environmental degradation<sup>94</sup>.

The traditional forms of water management should also be revived. Such traditional ways of water conservation and control had been practiced in many villages in Bihar, West Bengal since time immemorial which ensures peoples participation for management of floods. Community participation at every stage of policy making has to be ensured as this could result in constructive approach for addressing complex situations both at the local and national levels of disaster management in India. Hence an ecological approach has been advocated to mitigate flood disasters<sup>95</sup>.

To address the natural disaster scenario in India and in this case in the state of Bihar within a proper perspective a **field survey** was conducted in the disaster prone areas to understand the situation of disaster preparedness and mitigation (flood) in India. The field survey was conducted in Madhepura district and Belsand block of Siatmarhi district Bihar to study the situation of disaster preparedness and mitigation in the region. The survey conducted on a small scale with random sampling brings out the difficulties and hardships of the people during flood situations in the state<sup>96</sup>.

Historically the entire Kosi- Gandak – Baghmata river basin system is one of the worst affected regions in north Bihar due to floods. This region is also one of the most vulnerable areas in terms of socio- economic indicators as a result the poor and the marginalized gets worst affected. A detailed conversation with community members, villagers and womenfolk was considered that showed the level of the disaster preparedness and mitigation being very low. Living with floods

has become a way of life. Immediate relief after the floods follows but rehabilitation is very slow even at times it takes years to rehabilitate and bring agricultural land under cultivation that has been degraded due to heavy sand casting as a result of floods.

The core services like drinking water supply, reliable energy, health services particularly of the women and children and economic security of the home and the womenfolk is highly compromised during and after floods. Conversation with members of the NGOs working in the Belsand block of Sitamarhi district regarding disaster preparedness means strengthening the core issues like drinking water, health, sanitation, energy supply, education especially for girl child and economic security by employment and agricultural support.

Working in the field of Community Managed Disaster Risk Reduction Programme (CMDRR) the local NGOs with support of the government are trying to strengthen the core services for capacity building of the communities to disaster preparedness of the communities impacted by natural disasters particularly flood disasters in the region.<sup>95</sup> The CMDRR programme being conducted in these villages is to build resilience of the communities to handle impacts of disasters and “building back better”.

Various stakeholders are creating awareness and educating the communities regarding disaster risk reduction and capacity building. At the lowest level of governance involvement of the gram panchayats are ensured for integrating people in the decision making process for better informed decisions to be formed with regards to building resilience of the communities towards disaster. At the lowest level of governance the involvement of gram panchayats must be ensured for integrating people in the decision making process for better informed decisions to be formed with regards to building resilience of the communities towards disasters.

## ***II) Case Study B- Cyclone Aila 2009***

### ***Vulnerability to cyclone disaster***

India is one of the most multi-hazard prone countries of the world and cyclone is one of the major disasters that strike India regularly. Cyclone is one of the natural disasters that frequently strike the coastal areas of India. Tropical cyclones cause huge damages to coastal infrastructure and social livelihood. The Super Cyclone (Orissa)-1999 left behind a trail of devastation unparalleled in the in the history of cyclone events in India<sup>97</sup>. According to the World Meteorological Organization India accounts for 6% of the total number of cyclones world wide compared to Japan 30% and USA 23% but records maximum damages<sup>98</sup>. According to the Vulnerability Atlas of India the eastern coast of India is highly vulnerable to cyclones. India's eastern coast has a long history of devastating cyclones<sup>99</sup>.

Historically the coastal areas of Gujarat, Tamil Nadu, Andhra Pradesh, Odhisa and West Bengal are mostly frequented by tropical cyclones. From the period of 1977–2014 India has been exposed to 35 incidence of cyclone, some very severe in nature. Out of 35 deadliest tropical cyclones in the world history 26 have been Bay of Bengal storm surges. During the past two centuries 42% of the Earth's tropical cyclones deaths have occurred in Bangladesh and 27% have occurred in India<sup>100</sup>.

The following Table 6.10 presents the occurrences and extent of cyclone disasters in India during the two decades (1990-2014).

**Table 6.10 Cyclones Occurrences and Extent in more than last two (1990-2014) decades in India**

<i>Year</i>	<i>Cyclone Name</i>	<i>States Affected</i>
1990 (May 1990)	B0B01	Andhra Pradesh
1991 (Nov. 14, 1991)	B0B09	Tamil Nadu
1992	B0B06	Kerala, Karnataka, Tamil Nadu
1993	B0B03	Karnataka, Tamil Nadu
1993	B0B5	Kerala
1994	ARB02	Maharashtra
1996	08B	Tamil Nadu
1996	ARB01	Gujarat
1998	B0B05	Andhra Pradesh
1998	ARB05	Gujarat
1998	ARB02	Gujarat
1999 (Oct. 17, 1999)	B0B05	Odisha
1999	B0B06	Odisha
2000	B0B06	Kerala
2000	B0B05	Tamil Nadu
2001 (May 24, 2001)	ARB01	Gujarat
2003	03B	Andhra Pradesh
2004 (Oct. 2, 2004)	0niL	Gujarat
2005 (Dec. 8, 2005)	Fanoos	Tamil Nadu, Kerala
2007	Yemyin	Gujarat, Andhra Pradesh
2008 (Nov. 26, 2008)	Nisha	Tamil Nadu
2008 (Nov. 14, 2008)	Khaimuk	Andhra Pradesh
2009	Aila	West Bengal
2009	Phyan	Maharashtra
2010	Jal	Maharashtra
2010 (Aug. 9, 2008)	Laila	Andhra Pradesh
2010 (July 11, 2010)	Jal	Tamil Nadu
2011 (Dec. 29, 2011)	Thane	Tamil Nadu
2012 (Oct. 13, 2012)	Nilam	Andhra Pradesh, Tamil Nadu
2013	Madi	Tamil Nadu
2013 (Oct. 11, 2013)	Phailin	Odisha
2013 (Nov. 25, 2013)	Lehar	Andhra Pradesh
2013 (Nov. 21, 2013)	Helen	Andhra Pradesh
2014 (Oct. 12, 2014)	Hudhud	Odisha
2014 (Oct. 31, 2014)	Nilofar	Gujarat

Source: Ref: Available at [http://www.mapsofindia.com/maps/india/cyclone\\_prone\\_areas.html](http://www.mapsofindia.com/maps/india/cyclone_prone_areas.html). [Accessed on 20 February, 2016 at 11.15a.m.]

The factors that make India vulnerable to tropical cyclones are: (1) Geo-Physical Factors of Risk and (2) Anthropogenic Factors of Risk. Both the factors are briefly explained below.

### ***(1) Geo-Physical Factors of Risk***

The Indian sub-continent is geophysical vulnerable due to its location which is considered hotspot for tropical cyclones with warm sea temperature, high relative humidity, causing formation of massive clouds, creation cyclonic pressure in Bay of Bengal that is likely to lead to more intense tropical cyclones accompanied with high intensity of storm surges which is the catastrophic phenomena of cyclones<sup>101</sup>.

The coastal region of India (East and West Coast) is highly vulnerable to cyclones originating mostly in Bay of Bengal (East) and Arabian Sea (West) accompanied with storm surges due to its geo-physical location in the Indian Ocean. The region of South Asia with a vast coastline of 12,000 km has extremely high population density along the coast. According to global data records it has been observed that in the past three centuries 20 out of 23 major cyclone disasters have occurred in the Indian sub-continent<sup>102</sup>.

In India cyclones are considered most destructing among the natural disasters when viewed in terms of their severity and extent of destruction mostly originating on the eastern coast making Tamil Nadu, Andhra Pradesh, Orissa and West Bengal prone to severe cyclone every year. India experiences extreme cyclones that generally occur in two seasons: post monsoon from late September to middle of November or early December and pre-monsoon that can happen in April to early June which often causes heavy rainfall and cyclonic floodings. Cyclonic flood is much more disastrous than normal flooding as it submerges agricultural land, salinity of the soil increased, destruction of houses, causing devastating damages to crops, high death tolls and loss of livestock. Such disasters have occurred several times in the past causing destruction of lives and livelihood<sup>103</sup>.

## ***(2). Anthropogenic Factors of Risk***

The population pressure in the coastal regions of India has broader implications for the demographic vulnerability of the country. According to the Indian Census 2011, nearly 48% of the total population from coastal areas is currently living in urban centres and more than 50% of towns and villages are situated in the coastal regions of India<sup>104</sup>. About one-third of India's population lives in coastal area and the density of population have been increasing at an alarming rate. Climate change is expected to increase the frequency of cyclonic events increasing the vulnerability of coastal ecosystems.

Among the coastal metropolitan cities in India, Mumbai, Kolkata and Chennai with a large share of population residing due to socio-economic reasons of livelihood and occupation are highly vulnerable to cyclonic disasters. The risk is higher when millions continue to live in low lying coastal areas, resulting in land degradation, over exploitation of inland wetlands affecting crop production, exploiting waterways impacting the economic activities of fishermen dependent on this vital resource. People occupying the low lying coastal plains are most likely to be impacted by cyclones and storm surges destroying livelihoods and resulting in high death tolls. The coastal vulnerability of metropolitan cities and urbanization has increased disaster risks<sup>105</sup>.

### ***Comparative Assessment of Major Cyclone Occurrences in India***

A comparative assessment of major cyclones below shows the intensity of loss and damages incurred and its impact on the development scenario of the country. The occurrences of tropical cyclone are a regular affair in the coastal regions of India. The worst cyclone that India has faced in recent history was the Great Orissa Cyclone of 1999 that killed 10,000 people classified as “Super Cyclone Storm” impacting the North Indian Ocean, Bay of Bengal and the Arabian

Sea<sup>106</sup>. A comparison of Cyclone Aila 2009 with other severe cyclones in India in recent past shows that in case of Aila 2009, the state of West Bengal was highly impacted. The high number of casualties was due to the fact that cyclone was accompanied by storm surges with lack of adequate shelters and preparedness increased the casualties during cyclone events. The cyclone of 2009 have caused much greater damage to the economy as people in the Sundarban area are heavily dependent on agriculture and fishing as their only means of livelihood<sup>107</sup>. The following Table 6.11 brings out the comparative assessment of damages and loss caused due to cyclones in last forty (40) years in India

**Table 6.11: Comparative Assessment of Major Cyclone Damages in the last 40 years in India (1980-2014)\***

<i>Year of Cyclone</i>	<i>Affected population / location / area</i>	<i>Affected Population (in million)</i>	<i>Loss of no. of human lives</i>	<i>Loss to corps and property</i>
<i>1982 Cyclone</i>	<i>Saurashtra</i>	<i>NA</i>	<i>514</i>	<i>Livestock dead toll nearly 0.15 million. Loss to crops estimated at about 1.27 billion</i>
<i>1983 Cyclone</i>	<i>Andhra Pradesh</i>	<i>NA</i>	<i>134</i>	<i>Livestock death toll 42,800. Damage to crops estimated at Rs. 0.34 billion</i>
<i>1984 Cyclone</i>	<i>Andhra Pradesh, Tamil Nadu</i>	<i>NA</i>	<i>658</i>	<i>Livestock death toll 90,650. Damage to crops estimated at Rs. 2.32 billion</i>
<i>1988 Cyclone</i>	<i>West Bengal</i>	<i>NA</i>	<i>532</i>	<i>Livestock death toll 57,604</i>
<i>1990 Cyclone</i>	<i>Andhra Pradesh, Tamil Nadu</i>	<i>7.78</i>	<i>928</i>	<i>Rs. 22.47 billion</i>
<i>1994</i>	<i>Andhra Pradesh, Tamil Nadu</i>	<i>NA</i>	<i>226</i>	<i>Loss to property estimated at Rs. 6.12 billion in Tamil Nadu 4,44,194 hectares of land in Andhra Pradesh</i>
<i>1996 Cyclone</i>	<i>Andhra Pradesh</i>	<i>NA</i>	<i>1058</i>	<i>0.3 million houses fully and a similar no. partially damaged. 0.1 million hectares of crop damaged. Loss of property worth Rs. 61.26 billion</i>
<i>1999 Cyclone</i>	<i>Odisha</i>	<i>12.9</i>	<i>9887</i>	<i>1.8 million hectare of crop area and 1.6 million houses damaged</i>
<i>1999 Cyclone</i>	<i>West Bengal</i>	<i>0.79</i>	<i>NA</i>	<i>Rs. 577.30 million</i>
<i>2005 Fanoos</i>	<i>Tamil Nadu and Kerala</i>			
<i>2007 Yemyin</i>	<i>Gujarat and Andhra Pradesh</i>			
<i>Year of Cyclone</i>	<i>Affected population / location / area</i>	<i>Affected Population (in million)</i>	<i>Loss of no. of human</i>	<i>Loss to corps and property</i>



			<i>lives</i>	
<b>2008 Nisha</b>	<b>Tamil Nadu</b>		<b>180</b>	<b>Rs. 3789 crore</b>
<b>2008 Khai-Muk</b>	<b>Andhra Pradesh</b>			<b>Rs. 4 crore damage of crops and houses</b>
<b>2009 Phyan</b>	<b>Gujarat and Maharashtra</b>	<b>NA</b>	<b>NA</b>	<b>Massive damage to property in coastal districts of Maharashtra. 200 Goanese fishermen were missing and 300 were stranded helpless</b>
<b>2009 Aila</b>	<b>West Bengal and Orissa</b>	<b>100 thousand left homeless An estimated 1000 acres of cropland lost in Orissa due to Aila</b>	<b>149 At least 50,000 hectare of agricultural land lost due to storm in West Bengal</b>	
<b>2010 Jal</b>	<b>Orissa and Andhra Pradesh</b>	<b>70,000 people evacuated from 4 districts of Andhra Pradesh. Affected Ganjam and Jagatsingpur of Orissa</b>	<b>54</b>	<b>More than 3,00,000 hectares of crop damaged</b>
<b>2010 Laila</b>	<b>Andhra Pradesh badly affected</b>	<b>NA</b>	<b>NA</b>	<b>Loss of over Rs. 500 crore to the state exchequer</b>
<b>2011 Thane</b>	<b>Tamil Nadu (Cuddalore) and Puducherry</b>		<b>46</b>	<b>Sever damage to the economy</b>
<b>2012 Nilam</b>	<b>Coastal town of Mahabalipuram in Tamil Nadu, Chennai</b>	<b>3000 people evacuate from Mahabalipuram and Chennai</b>	<b>12</b>	<b>Property worth Rs. 100 crore was damaged</b>
<b>2013 Phailin</b>	<b>Odisha and Andhra Pradesh coast</b>	<b>Affected 12 million people. Around 1,154,725 people were evacuated, India's biggest evacuation in 23 years. With more than 5,50,000 people moved to shelter homes in Odisha and Andhra Pradesh</b>	<b>40</b>	<b>Damaged crops worth Rs. 240 crore. The state of Orissa accumulated Rs. 42.4 billion as total damages.</b>
<b>2014 Hudhud</b>	<b>Odisha and Andhra Pradesh</b>	<b>Odisha kept on high alert</b>	<b>61 in Andhra Pradesh</b>	<b>Damaged Rs. 21,908 crore worth of property</b>

Source: \*(Data compiled by the researcher from following sources)

Ref: i) India's major natural disasters since 1980s / ASRI. [www.icari.res.in/agridata//13data5%chapter1%SCdb2013tb1\\_8.pdf](http://www.icari.res.in/agridata//13data5%chapter1%SCdb2013tb1_8.pdf) [Accessed on 10 February, 2016]

ii) India Today (October 5, 2015) "151 years of Terrifying Calcutta Cyclone: Seven Worst Cyclones that hit India" Available at: [www.indiatoday.indiatoday.in/education/story/cyclones/1/490449.html](http://www.indiatoday.indiatoday.in/education/story/cyclones/1/490449.html). [Accessed on 20 February, 2016] iii) Major recent cyclones in India. Available at: [www.skymetweather.com/content/weather-news-and-analysis/severe-cyclone-has-hit.india/html](http://www.skymetweather.com/content/weather-news-and-analysis/severe-cyclone-has-hit.india/html). [Accessed on 20 February, 2016]

## ***II) Case Study B- Cyclone Aila 2009***

The case of Cyclone Aila (2009) has been taken up for study since it is considered as one of the worst cyclones to hit India after the devastating cyclone of Super Cyclone Orissa 1999, to understand the linkages between natural disaster, development and security of the people in the light of various structural and non-structural measures to mitigate the cyclone disaster.

Since the 1990, particularly after the devastating Super Cyclone Orissa 1999, various initiatives for management of cyclones have been undertaken to mitigate cyclone disasters so as to reduce the vulnerabilities of the people especially the poor and the marginalized including women and children. India has been moving towards a workable system of disaster management to mainstream disaster risk strategies in development plans and policies. Contextually the case study of Aila (2009) has been taken up to examine the issue of disaster management.

### ***Nature and Extent of Cyclone Aila 2009***

On 25<sup>th</sup> May, 2009 Cyclone Aila described as severe cyclone resulted in one of the worst natural disasters striking India (West Bengal) and Bangladesh also being considered as one of the biggest storms in recent times in South Asia after Cyclone Sidr that hit Bangladesh in 2007 Cyclone Aila had developed over Bay of Bengal and crossed Sager Islands on 25<sup>th</sup> May as a severe cyclone storm with wind speed of 100 to 110 kmph with widespread rain impacting Orissa, West Bengal, Sikkim, Assam and Meghalaya causing heavy damages, loss of life and property<sup>108</sup>.

Estimated reports present extensive damages caused to houses, infrastructure, harvests, food stock, water, sanitation and livelihood impacting farmers and fisherman particularly in the

coastal areas of Sunderbans. The State of West Bengal (India) was worst affected by Cyclone Aila. At least 149 people were killed and more than 100,000 left homeless due to flooding. The cyclone accompanied by heavy rainfall, flooding and landslides impacted 16 districts of West Bengal out of which 524 parganas, North 24 parganas, districts of Sunderbans was the worst affected with West Mednipore, East Mednipore, Howrah, Hoogly, Burdawan, Darjeeling and city of Kolkata was severely disrupted. In northern parts of the State of West Bengal, landslides in Darjeeling district due to heavy rains killed 22 people and left 6 other missing. At least 500 homes were damaged<sup>109</sup>.

According to the Oxfam Situation Report on 2<sup>nd</sup> June, 2009 the state of West Bengal, India was heavily impacted with 5 million people affected. Areas in Sundarbans continued to remain submerged affecting 2.6 million people with death toll of 100 and around 152,000 houses collapsed with 89,000 partially damaged and 500 meters of embankment breached in South 24 Parganas<sup>110</sup>.

The Cyclone Aila Situation Report of UNDP states a detailed overview of 16 districts in West Bengal that were badly impacted by Cyclone Aila and by May 28, the population affected in state reached over 5.1 million. The official damage impact assessment conducted by Government of West Bengal and UNDP put the death toll at 96 people. Over 500,000 houses were damaged either fully or partially and a similar amount of crop area was affected, over 60,000 people were accommodated in government relief camps and contingency fund of Rs. 15,000,000 was announced for the relief operations in the state<sup>111</sup>. The following Map 6.3 of Cyclone Aila provides a view of the worst affected areas of West Bengal.

*Map 6.3: Cyclone Aila impacted areas*



*Source: Ref: SDMC Newsletter. July 2009, Vol III No 3 SAARC Disaster Management Centre. New Delhi. Available at [http://www.saarc\\_sdmc\\_nic\\_in](http://www.saarc_sdmc_nic_in) [Accessed on 28 March, 2015 at 2.41p.m] p 2*

### ***Impact of Cyclone Aila: Social, Economic and Environmental***

The impact of cyclone Aila can be assessed at three levels—social, economic and environmental. At the **societal level** the damage was devastating. Particularly Aila impacted the state of West Bengal and Sunderbans. The damage in West Bengal and Sunderbans part of India was extensive including houses, low hatched mud houses blown away and enormous damages to trees and mangrove forest in the coastal areas. The worst affected area was South 24 paraganas, districts of the Sunderban blocks ( Gosaba, Basanti, Sagar, Namkhana, Patharpratima and Kakdwip) besides North 24 paraganas, West Mednipore, East Mednipore, Hoogly, Howrah and Kolkata<sup>112</sup>.

Post Aila survey shows that the cyclone had badly affected villages of Basanti, Kultali and Patharpratima blocks (South 24 Paraganas part of Sunderbans). Out of the 60 families in Kultali,

50% houses were completely destroyed and more than 25% of the houses partially damaged. Similarly more than 50% of the houses in a village in Patharpratima were completely destroyed. Aila has also led to severe impact on the coastal economic activities. About a large number of fishermen were affected due to the storm surge. Post Aila scenario reflected acute shortage of drinking water, rise in salinity of water due to inundation from storm surges and sanitation, infrastructure destroyed in all the blocks of Sunderbans<sup>113</sup>. A post Aila investigation conducted by the Government of India and state of West Bengal states that the affected areas experienced severe health problems with the spread of water borne diseases due to shortage of drinking water and other health related difficulties<sup>114</sup>.

The **economic impact** of cyclone Aila 2009 was severe considering the amount of destruction it caused to the socio-economic sector particularly of the state of West Bengal, India. The state of West Bengal and UNDP prepared the damage impact assessment report that stated 96 deaths out of which 25 deaths were caused due to landslide in Darjeeling. The cyclone accompanied by heavy rainfall and flooding worst impacted the South 24 Parganas and North 24 Parganas districts of the Sundarban area. In Sundarban an estimated 9,20,000 houses have been damaged<sup>115</sup>. The storm also impacted agricultural production since the farmers were preparing to harvest rice and other crops. Saline water led to inundation of houses and land impacting also 60% of the area in these two districts rendering agricultural land unsuitable for cultivation. Almost five blocks in North 24 Parganas and all 13 blocks in South 24 Parganas were affected by saline water<sup>116</sup>.

An independent research study conducted on conditions of agricultural productivity in the Gosaba block of South 24 Parganas reflected that agricultural production system was totally

hampered after Aila due to high soil salinity. Particularly Rice (Paddy) production (both Aman paddy in Monsoon Season and Boro Paddy in winter season) dropped in case of Post-Aila scenario. Before Aila average production of Boro paddy was 34671 kg/per hectare in 2008-2009 which reduced to 20833 kg/ per hectare in 2012-2013 and Aman paddy production reduced from 28004 kg/ per hectare in 2008-2009 to 14525 kg/ per hectare in 2012-2013. Maximum reduction in rice was observed in Rangabelia (Boro paddy) and Hentalbari mouza of Gosaba Island block in South 24 paraganas<sup>117</sup>.

Another independent research study on Post-Aila situation observed that South 24 Parganas of the Sundarban blocks were badly impacted by Aila particularly Gosaba, Basanti (I and II), Sagar Islands, Namkhana, Patharpratima, Kakdwip. The 3500 km long embankments protecting 54 islands of Sundarbans, South 24 Parganas were breached at places. The total length of the embankment severely damaged in these blocks was 621.95 km. The total damage to embankments was estimated over 1,743 km removing the only protection available to people in the coastal areas of the Sudarbans. Out of 308 sluice gates about 125 were completely damaged resulting in saline intrusion and flooding of the islands. The total area in South 24 Paraganas inundated with saline water was 1,05,075 hectare with fresh water availability being highly contaminated<sup>118</sup>.

According to the Government of West Bengal, Inter Agency Multi-Sectoral Assessment Report – cyclone Aila June 2009 Report on damage impact assessment conducted by Government of West Bengal and UNDP and others undertaken by team of experts comprising members of Government and multilateral response partners<sup>119</sup>, estimated the damage in terms of socio-economic and physical damage caused by Cyclone Aila required an initial sum of Rs. 15,000,000

for contingency relief. As per the official damage report of Government of West Bengal 2.89 million hectare of agricultural lands have been inundated with 100% loss of standing crops and stored grains in North and South 24 Paraganas as most of the houses were washed away resulting in lack of food for the Sundarban island people. It was one of the worst cyclones that the islanders had to face in the last 20 years<sup>120</sup>.

The most affected were housing, agriculture, transport, educational institutes, fresh water availability. Damages and losses were concentrated in housing sector, agricultural sector and infrastructural sector. In the Indian part of Sundarbans, the islands and the reserve forested area holds survival for the poor and very poor population. Nearly ninety-five (95%) of the population of Sundarban depend primarily on agriculture which is basically monsoon based. About fifty (50%) of the agriculturalists are landless labour and during non-agricultural season survive by fishing and collecting forest products or on prawn cultivation. Disaster had a disproportionate impact on the poorer sections of the population of Sundarbans Islands that exposed the vulnerability of the people who remain socially and economically neglected<sup>121</sup>.

The **environmental impact** can be accessed from the fact that almost the entire coastal belt of Sundarbans Island area where an estimated 5.2 million people were affected in almost sixteen districts of Sundarbans, West Bengal. Agricultural land was submerged due to coastal flooding, impacting agricultural production in the current financial year, breach of coastal embankments, soil erosion of coastal area, increase in soil salinity, water contamination, lack of access to clean water, disruption of sanitation facilities and outbreak of water borne diseases<sup>122</sup>.

The Sundarbans identified as World Heritage site also referred as the “Mangrove Forests” is the world’s largest single tract mangrove forest spreading across the coastal areas of India and

Bangladesh that act as natural embankments for the coastal border areas against storm surges arising with cyclones<sup>123</sup>.

During the Cyclone Aila the mangroves at Sundarbans acted as natural shield by absorbing a massive hit of the cyclone's fury with many trees uprooted along the coastal belt. Comparing the impact of 2009 Aila in India with Bangladesh which shares two-third of the mangroves in the Bay of Bengal while India has only one-third of the forest, devastation on the India side was much higher<sup>124</sup>.

The following Table 6.12 presents an account of the damages and loss caused by severe cyclone Aila 2009 and its impact on the people.

**Table 6.12 Cyclone Aila: Impact Assessment of Damages and Loss, India (West Bengal)**

<i>Number of villages affected</i>	<i>4249</i>
<i>Size of affected population</i>	<i>25,62,442</i>
<i>Number of people missing</i>	<i>8,000</i>
<i>Number of deaths</i>	<i>Official 70, Unofficial 300</i>
<i>Length of embankment breach</i>	<i>400 kmts.</i>
<i>Number of cattle lost</i>	<i>2,12,851,12,851</i>
<i>Total area of agricultural land affected</i>	<i>1,52,872 hectare</i>
<i>Estimated financial loss in agriculture</i>	<i>Rs. 337 crores</i>
<i>Number of houses fully damaged</i>	<i>1,94,390</i>
<i>Number of houses partially damaged</i>	<i>1,94,701</i>
<i>Total loss</i>	<i>Rs. 1495.63 crores</i>

*Source: Ref: Unpublished records of the Government of West Bengal. Rudra, K. 2010 "A South Asian Journal on Forced Migration" MCRG, Kolkata, in Debnath, Ajay (2013) International Journal of Scientific and Research Publications. Vol. 3, Issue: 7 July, 2013 [Accessed on 04 June 2016 at 12.55p.m.] pp 86-93*

### ***Disaster Management and Mitigation Strategies in India: Cyclones***

In the context of Cyclone Aila 2009, the policy initiatives and preparedness mechanisms would be addressed to bring out a clear understanding of cyclone mitigation, preparedness, policies and mechanisms adopted by India. Tropical cyclone continues to be a major hazard for the



country and time and again has devastated the lives and economy of the country. To mitigate the impacts of cyclones, the government policy has been to develop and implement various measures to better equip the country to deal with the destructions caused by cyclones.

India has adopted and evolved continuously cyclone management strategies and preparedness mechanisms both structural and non-structural to mitigate the vulnerabilities associated with cyclone disasters generating mixed response at the societal level. The initial policy response of the government has been to adopt various structural measures by emphasizing on the building of cyclone shelters, cluster shelters, coastal embankments to reduce the vulnerability of the coastal areas by planting of mangrove forest on land between the embankment and the shore line though not received positively by the local population due to their fears of being left outside the embankment areas for cropping purposes and also local dependent on sea fishing<sup>125</sup>.

The non-structural measures include building of a disaster regime started from the Tenth Plan (2002-2007) onwards, followed by the enactment of the Disaster Management Act 2005, National Policy on Disaster Management (2009). Various non-structural measures such as Cyclone Warning, Coastal Zoning Mapping and Plan, Land Resource Management and Planning for Coastal Areas, Emergency Preparedness and Cyclone Relief and Response were strengthened<sup>126</sup>.

The non-structural measures were incorporated to strengthen the disaster risk reduction strategies along with structural measures as previous cyclone events have showed that only structural measures, weak governance and lack of accountability alone could not mitigate the negative impacts of cyclone events.

### ***Disaster Management and Cyclone Aila 2009***

In the context of cyclone Aila 2009, the efforts undertaken for cyclone risk mitigation highlights the preparation undertaken to mitigate the disaster. In India floods and cyclones occur regularly, so there is need for proper disaster management policy implementation to reduce loss and damage to lives and livelihood in the event of disaster. To mitigate the devastating impact of disasters structural measures must be coordinated with non structural measures including the various legal and institutional mechanisms and preparedness measures.

To mitigate the risks associated with disasters accordingly the Government of West Bengal had framed the West Bengal State Disaster Management Policy and Framework in 2005 to strengthen the institutional capacity for disaster risk reduction. The policy had been framed for effective disaster management that can help to minimize the disruption in economic activity and damage to the environment and ensure continuity and sustainability of development<sup>127</sup>.

The institutional capacity of the government to manage cyclone disaster in 2009 was highly challenged in the state. The local and state government structures were not fully prepared for such a large scale disaster that hit the state after twenty years including Sundarbans, the two districts of North and South 24 Parganas. It is to be noted that Cyclone Aila 2009 Interagency Multisectoral Needs Assessment Report with assessment and recommendation for recovery from cyclone damages stated that 2.879 million hectares of agricultural lands have been inundated with 100% loss of standing crops and stored food grains in North and South 24 Parganas. The Report further corroborated the facts that the cyclone has further impacted health, nutrition and sanitation sectors. The immediate response of the government of West Bengal was to provide relief operations with policy initiative for food security<sup>128</sup>.

The Government of West Bengal was extremely proactive in relief operations in the immediate aftermath of disaster though pre- disaster preparedness and mitigation approach was less forwarding and not significant. An emergency effort was initiated by the state government with assistance from the armed forces, defense personnel, Kolkata police, National Disaster Response Force and a number of national and international relief organization<sup>129</sup>. An extensive evacuation operation was undertaken to bring nearly 4,00 000 people who were marooned in Sundarban islands did not have access to relief aid<sup>130</sup>.

According to the Cyclone Aila Situation Report of Government of West Bengal, a high level preparedness meeting was held on May 25, 2009 to review the situation. The then Chief Minister of the State (Buddhadeb Bhattacharya) called for army response to conduct rescue operations in the most difficult areas of Sundarbans. The army was put on high alert with emergency evacuation of the people from low lying areas<sup>131</sup>.

The central government (under Prime Minister Manmohan Singh) announced ex- gratia relief of Rs 200,000 for each of those killed in the cyclone and other areas of east India. The state government immediately made arrangements for temporary cyclone shelters for Aila affected people. The government also allotted immediately funds for disaster relief contingency particularly for North and South 24 Parganas and East Mednipur<sup>132</sup>.

Independent research study conducted to enquire into the disaster relief and politics regarding cyclone Aila by Amites Mukhopadhyaya highlights the short term disaster relief approach adopted by the government of West Bengal in case of cyclone Aila. As part of its short term relief approach the administrative machinery was put on high alert and distributed relief supplies, water and medicine among the Aila victims. Local sub- divisional, block development offices

and panchayat bodies were mobilized for immediate relief activities. The government initiatives were supplemented by local, national and international non- governmental organizations<sup>133</sup>.

Presenting the narrative of aid and politics of relief distribution Amites Mukhopadhyaya highlights that for long term relief and development work that (i) firstly a large part of the embankment was severely damaged and destroyed that required repair under the irrigation department of the state and reconstruction of houses for affected people entrusted to local administrative bodies with active support of local non governmental bodies. (ii) secondly the relief distribution generated a lot of criticism for the then left front government from the people and opposition alike as being incapable of responding to the needs of poor and the vulnerable. This requires more transparency and effective governance to respond to disaster events<sup>134</sup>.

Various stakeholders expressed great concern that Aila impact might push a large number of poorest families deeper into poverty which required targeted assistance including food relief, support to agriculture, employment opportunities, micro-credit and financial assistance to rebuild their homes. Various non-governmental organizations (NGOs) both national and international were involved in food relief and rehabilitation work during pre and post Aila situation<sup>135</sup>.

In a similar vein a situation analysis and assessment report was prepared by the Jamsetji Tata Centre for Disaster Management, Tata Institute of Social Sciences (TISS Report 2009) with focus on situation analysis, disaster mitigation and preparedness of the state during such disaster events<sup>136</sup>. The TISS Report 2009 enumerated the challenges faced by the people in rescue and relief operations as those displaced to temporary shelters inland faced great difficulties than those living near the embankments the breach of the embankment further aggravated the situation. Further the local level institutions particularly at the panchayat levels are considered

the most crucial link in the humanitarian chain for disaster mitigation. This chain was highly challenged in both the North and South blocks of 24 Parganas as a combination of political alignments and a lack of monitoring of relief operations led to major discrepancies<sup>137</sup>.

The TISS Report 2009 expressed the need to improve disaster response and preparedness at the local level. Capacity building exercise must be engaged into district level and local level administration with proper policy and planning, with provision of immediate rescue, resource management and distribution, emergency funding mechanism with better information management and contingency planning. Better coordination is required between the government officials and administrative setup with civil body organizations and non- governmental organizations as they are more equipped with local knowledge about the actual situation. Coordination with local organizations could help in distributing relief and rehabilitation in a more systematic way. In the long run more emphasis is required on mitigation and preparedness measure for managing future disasters and to reduce the vulnerabilities of the people by engaging in proper development plans<sup>138</sup> At the same time various stakeholders are creating awareness and educating the communities regarding disaster risk reduction and capacity building. At the lowest level of governance involvement of the local level administration must ensure for integrating people in the decision making process for better informed decisions to be formed with regards to building resilience of the communities towards disaster.

### ***Disaster Management: The Current Status: West Bengal: India***

Presently many state governments in India are moving towards mainstreaming of disaster preparedness and mitigation in various plans and policies to strengthen disaster management framework. Currently the West Bengal State Disaster Management Authority working under

Department of Disaster Management has started changing the strategy towards management of disaster. Disaster Management requires strengthening of disaster preparedness and disaster risk reduction strategies that require both structural and non-structural measures to be integrated for a more holistic approach to get better result. The objective for implementation of disaster management mechanisms is to minimize the disruption in economic activity and damage to the environment, also to ensure human security and to ensure continuity and sustainability of development<sup>139</sup>.

According to Section 23(1) of Disaster Management Act (2005) “there shall be a plan for disaster management for every state to be called State Disaster Management Plan” (SDMP). The Government of West Bengal, Department of District Management in compliance with the provisions of the Disaster Management Act (2005) prepared the SDMP in July, 2007. The objective of the SDMP is to facilitate disaster related prevention and preparedness activities as well as coordinated effort of relief operations and community awareness with community involvement during disaster events<sup>140</sup>.

It is to be noted that following Cyclone Aila the State notified formation of District Disaster Management Authority (DDMAs) in eighteen districts. The DDMAs under Section 25 of the Disaster Management Act, 2005 requires the constitution of DDMAs in the district with District Magistrate as the Chairperson and Sabhadhipati of Zila Parishad (the highest tier of Panchayati Raj institution) as Co-Chairperson. The Government has formulated District Disaster Management Plan (DDMP) for all the 19 districts of West Bengal including the DDMP for South 24 Parganas which is one of the most disaster prone (cyclone and flood) districts highly impacted by cyclone Aila in 2009<sup>141</sup>.

Further, as per Section 14(1) of the Disaster Management Act, 2005 West Bengal government has also constituted the State Disaster Management Authority (WB-SDMA) in August, 2007 and reconstituted it in November 2011. The Department of Disaster Management, West Bengal acts as a separate department for disaster management (WB-DMD). Unlike other states in India the WB-DMD performs the functions of SDMA<sup>142</sup>.

The Department of Disaster Management is the nodal agency in West Bengal to coordinate all relief and disaster preparedness and mitigation related efforts in the state. Initially disaster management was “relief centric” and relief was a subject of the Department of Flood Relief and Supplies in West Bengal which was later transformed into full-fledged Department of Relief in 1992. Following promulgation of Disaster Management Act (2005) and keeping with the need to change from “relief centric approach” to “proactive approach” the Department has been renamed as Department of Disaster Management in 2006<sup>143</sup>.

The coastal areas of Sundarbans following cyclone Aila is witnessing coastal bank erosion. A research team from Jawaharlal Nehru University in collaboration with West Bengal Disaster Management Authority finding “clear signs of erosion” had stressed the need for a “multi-hazard plan” for the state. At present 1,012 multipurpose cyclone shelters are being built in vulnerable locations across all coastal areas under the National Cyclone Risk Mitigation Programme (NCRPM0 (Under the 12<sup>th</sup> Five Year Plan) for Sundarban alone the government has allocated funds worth Rs. 8,000 crores for relief that will directly impacting the lives of 4 million people living in the Sundarban Islands<sup>144</sup>.

The multi-hazard phenomenon has been thoroughly investigated in case of West Bengal. The state has been estimated as a first-order composite vulnerability distribution across the entire

territoriality of the state. Consequently a holistic outlook for disaster management has been emphasized in the state that would incorporate (i) delivery of appropriate regulations and policies (ii) inputs from scientific and research institutions (iii) collaboration of different organizations (iv) local participation and (v) awareness promotion for capacity building<sup>145</sup>.

At present to prioritize the system of disaster management from “relief centric” to “pro-active approach”, a paradigm shift has been initiated to bring in a more comprehensive disaster management approach. In West Bengal, the government has brought three different departments viz. Department of Fire, Department of Emergency Services and Department of Civil Defense under the Department of Disaster Management to effectively coordinate in crisis situation and ensure holistic disaster management in the state<sup>146</sup>. The main hurdle remain, regarding coordination among various related departments the state level and district level responsible for mainstreaming and implementing disaster management plans and policies to reduce disaster risk and building resilience of the communities impacted by future disasters.

To address the natural disaster scenario in India and in this case in the state of West Bengal within a proper perspective a **field survey** was conducted in the disaster prone areas to understand the situation of disaster preparedness and mitigation (cyclone) disaster in India. The field survey was conducted in the Gosaba block, Ranagabelia Gram panchayat, Pakhilara mouza, Dakshin Para of South 24 Parganas area of Sundarban archipelago to study the issue of disaster preparedness and mitigation, relief and response. The survey conducted on a small scale with random sampling brings out the difficulties and hardships of the people in the Post Aila scenario<sup>147</sup>.



The Sundarbans an archipelago comprising of 104 islands (on the Indian side of the delta) out of which 54 are inhabited and 48 are forested islands with mangroves forest declared as a Biosphere Reserve<sup>148</sup>. The coastal zone of Sundarban is highly vulnerable to high risk due to the interaction of direct and indirect agencies. Embankment breach is a major cause of flooding that needs to be strengthened keeping in view the environmentally fragile and ecologically sensitive nature of the Sundarbans. A proper long term management plan for Sundarbans is required with an understanding of the ecological setup of the region.

Further the fragile ecosystem of the Sundarbans presents a challenge to the people living in the coastal areas as the pressure on land is high considering the density of population that remains high in the inhabited area. While the population density of West Bengal is 1,030 person per sq. km. the islands of the Sundarbans archipelago has high population density of about 1000 persons per sq. km. exceeding the carrying capacity of the islands and exerting pressure on the fragile and rich ecosystem. Indian Sundarban Delta: A Vision Report (2011) estimates that nearly one million people would become climate refugees by the year 2050<sup>149</sup>. Sundarbans will be badly hit by climate change and rise in sea level that would require better management of natural hazards scenario.

The Government of West Bengal, Department of Disaster Management initiated a State Disaster Management Policy and Framework in 2005 that outlined a strategy for pre-disaster phase and post disaster response. This policy document outlines an implementation framework that includes the development of institutional mechanisms, a broad mitigation and prevention strategy and disaster management policy down to the district and block levels including the Indian Sundarban Delta Region<sup>150</sup>.

As is evident in the case of cyclone Aila (2009) that devastated the Sundarbans the Disaster Management Policy Framework was not operationalized properly to mitigate the impact of disaster. Based on the primary findings in conversation with community members, villagers and womenfolk were considered that showed the level of disaster preparedness and mitigation being very low. During and after Aila devastation and even after seven years of post Aila phase living with flooding of the coastal areas and fear of cyclone in coming future is not unexpected.

Immediate relief after the cyclone followed but rehabilitation has been slow and at times it takes years to rehabilitate and bring agricultural land under cultivation that has been degraded salinization as a result of coastal flooding. The core services like drinking water supply, reliable energy, health services particularly of the women and children and economic security of the home and womenfolk is highly compromised during and after cyclonic event.

Conversation with members of community based organizations (CBOs) and local non-governmental organizations (NGO's) in the Gosaba Block, Pakhirala regarding disaster preparedness meant for them strengthening the core issues like drinking water, health, sanitation, energy supply, education for children especially girl child, enhancing and strengthening the transport and communication sector and economies by employment generation and agricultural support. All these concerns were indicative enough that development and human security concerns must be strengthened to build resilience of communities to disasters<sup>151</sup>.

Working in the field of community managed disaster risk reduction programme various stakeholders with support of the governments various projects are trying to strengthen the core services for capacity building of the communities to disaster preparedness and mitigation in the long run. These programmes are being conducted in the villages to build the resilience of the

communities to handle the impact of disasters and 'building back better' various stakeholders are creating awareness and educating the communities regarding disaster risk reduction and capacity building<sup>152</sup>. At the lowest level of governance the involvement of gram panchayats must be ensured for integrating people in the decision making process for better informed decisions to be formed with regards to building resilience of the communities towards disasters<sup>153</sup>.

### ***Disaster Management: Development, State and Governance***

Mainstreaming disaster management in national development plans and policies is an effective way to address the vulnerability factor of a large section of the population particularly the poor and the marginalized impacted most by the disasters. Disaster also impact the development scenario of the country which in turn must be addressed to reduce disaster risk and human security concerns by bring in the question of development.

Development in the context of India has always been addressed in terms of socio-economic growth being expressed in the visionary statement of Nehru, of 'ending poverty and ignorance and disease and inequality of opportunity, The overall success of the Indian state in achieving these tasks of economic development according to the noted scholar Amartya Sen has been limited in nature particularly in the field of elementary education given the performance of other developing countries practising diverse economic policies and mixed systems<sup>154</sup>.

Economic development must be seen in terms of expansion of opportunities that the individual enjoys in the society to be realised in the realm of public action within the ambit of policy matrix and in case of India failures in many sectors such as education, health sector, social security,

grassroot democracy, environmental protection and others could be described as overactive in some field and thoroughly underactivity in other areas<sup>155</sup>.

India since independence has embarked on five year plan regime to realize the dream of economic development characterized by centralized planning that generated some major debates regarding the adoption of planning strategy in India<sup>156</sup>. The result was state-led-development and protectionist policy that was radically changed with New Economic Policy in 1991, launched by the then Prime Minister Narasimha Rao with Manmohan Singh as the Finance Minister by adopting liberalization, privatization and globalization the major radical reforms since independence, moving from state-led-development towards market oriented economy<sup>157</sup>.

The change towards market-oriented economy brought out major debates on neo-liberal policy reforms adopted by the state in all major theoretical propositions regarding Indian economy and role of the state. As Jayati Ghosh points out that the debate on liberalization in the Indian context unfolds further shifts in economic strategy based on two assumptions firstly the centralized protectionist policy has failed to bring desired institutional change and reforms in case of income redistribution and secondly the sheer inability of the state to bring social change<sup>158</sup>. But this transformation of the Indian economy from a system of state control-centralized planning to a more liberal-market oriented reforms that have shown remarkable durability compared to other countries of the world<sup>159</sup>.

The neoliberal policy of economic development pursued by the Indian state continues to be premised on the trickle-down theory of human development and as such has given rise to unsustainable pattern of socio economic growth increasing the risks and vulnerabilities of the people especially in disaster scenario. Disasters have a disproportionate effect on the poor people

and as such the cost of disaster is often considered expensive in terms of people, communities, infrastructure loss and loss of developmental gains. This cost of disaster to some extent could be mitigated by planned expenditure and sometimes external funding for recovery and reconstruction to mitigate disaster risks<sup>160</sup>.

India's political economy in the last six decades has been moving from a paradox of accommodative politics and radical social change to a gradual transformation where democratic institutions are still the best hope to bring economic reforms with a "human face"<sup>161</sup>. Economic planning still continues to be the foundation of bringing in socio-political development in India, a continuous process of evolving choices, applying alternative methods of using available resources with the aim of achieving particular goals for common good. The policy matrix for funding disaster risk reduction in India systematically began with the Tenth Five Year Plan (2002-2007) that for the first time recognized disaster as an important component of sustainable development. However the Indian state has been engaged in "disaster relief" since the first plan (1951-1956) accommodating "relief funding" for disaster occurrences<sup>162</sup>.

Moreover humanitarian assistance has been a major component of disaster policy both at the national and international level for India. At the international level India's disaster relief diplomacy has emerged as a major policy initiative in response to natural disasters. This relief diplomacy must be properly backed by relief implementation mechanisms so that it does not impact bilateral relations between neighbours especially with India's close neighbours<sup>163</sup>.

The link between development policies and disaster risks depends on two broad conceptualization-firstly the detrimental effect of disaster on the overall socio-economic development of the country and secondly on faulty implemented development policies that

increases the vulnerability and risk of the communities. The role of democratic governance in averting disasters and building resilience is therefore the major activity area of the state<sup>164</sup>. This also brings into focus the issue of governance as ultimately managing disaster related activities such as relief, response, recovery and preparedness depends on effective governance capacity of the state and functioning of the government in the public sphere.

There has been a wide acknowledgment that “good governance” is part of the democratic governance of the state depending upon the efficiency and effectiveness of the institutions, effective delivery mechanisms for implementing various plans and policies, transparency and supportive framework of legislations with participatory politics and accountability of governance. The World Bank study on “Governance and Development” has highlighted four major aspects of governance in the public sector implying accountability, transparency and information, participation and professionalism in public sector management<sup>165</sup>.

The study brings out the linkage between “good governance and development” that is epitomized by predictable, open and enlightened with professional ethos acting in furtherance of public good, the rule of law, transparent processes and a strong civil society participation in public affairs. Consequently the concept of governance is increasingly being invoked to address and bring about excellence in disaster management and post rehabilitation initiatives in India<sup>166</sup>. Tenth Plan Document for the first time emphasized the role of good governance for effective implementation of policies and programmes related to disaster management. This depends on the effective delivery system and proper framework of legislation to manage disaster issues<sup>167</sup>.

Disaster management policies and performances in India bring out the variations in implementation at various levels of governance and performances are yet to be substantial. The

weak performance of the state in social sector and disaster management in particular where the state has failed to perform its prerequisite function is quite visible in handling of past recent disasters like Tsunami (2004), Kosi Flood (2008), Aila (2009), Jammu and Kashmir Flood (2013) and North East Flood (2013) Uttarakhand Flash floods (2013) with the only exception of cyclone Phyllin, Odisha (2014) that has once again challenged the disaster risk mitigation scenario in India<sup>168</sup>.

In this context mention should be made of the Comptroller and Auditor General (CAG) Report of 2013 that has highlighted the shortcomings of disaster risk mitigation strategies in India. The Report focused on a number of shortcomings highlighting variations in preparedness and implementation of disaster management policies in the states. In case of Uttarakhand the National Plan for Disaster Management was not formulated till 2013 even after six years of enactment of the Disaster Management Act, 2005. There are no provisions to make guidelines issued by National Disaster Management Authority (NDMA) binding on the states, major projects undertaken for disaster risk mitigation undertaken by NDMA are yet to be completed, communication systems for disaster management are developed and effectiveness of National Disaster Response Force (NDRF) is hampered due to shortage of trained manpower and infrastructure availability<sup>169</sup>. The present scenario brings out the challenges of disaster management and governance in the area of disaster mitigation.

### ***Disaster Management and Civil Society***

While addressing the linkage between governance and development the aspect of accountability has been stressed upon to bring about an integrated governance model where accountability, transparency and performance bring out the desired services emphasising the role of the multi

stakeholders. In this integrated governance approach acting as a pre-requisite for sustainable market oriented development, the state, private sector and civil society work in close cooperation and coordination to bring the desired sustainable development scenario to secure the lives of the people in context of threats that impacts human security.

This brings out the engaging role of civil society to fill the void created by poor governance of disaster issues. Involvement of communities in perceiving disasters and impending calamities and building upon capacity to face them is required for successful disaster management<sup>170</sup>. Contextually speaking civil society serves as a link between the realm of the state (defined by set of laws, norms and institutions for the purpose of governance, structuring and controlling a well defined territory) and the realm of society (defined as an aggregated of individuals living together as a organized and well bounded community) committed to a set of normative goals to achieve public good<sup>171</sup>.

In context of India civil society is viewed more as a political space where the social actions take shape to influence and change policy perceptions. According to Partha Chatterjee the western notion of civil society is of little relevance to the majority of the poor in post colonial societies as they are compelled to live beyond the organized world of citizenship, pluralism and associations. Civil society is viewed from the point of “political society” that reflects the realities of the people who are made to engage with the state through participation in the political process<sup>172</sup>.

In India a number of non-governmental organizations (NGO's) and civil society organizations (CBO's) have been engaged in the social-environmental movements like the Chipko movement, Narmada Bachao Andolan and others to ensure the voice of the people in the development agenda. Various local and national initiatives have helped to build the political space for civil



society maneuverings. Similarly in the disaster scenario many local and national NGO's are engaged to provide relief and rehabilitation as well as engaged in creating awareness among the people regarding disaster vulnerabilities and risks associated with hazards. The Barh Mukti Abhiyan a local NGO working in the field of flood related issues in Bihar for the last thirty years is a case to the point.

In the field of humanitarian assistance civil society organizations, local and international NGO's play a significant role during and after disaster event and work for relief and rehabilitation of the communities impacted by disasters. After the Gujarat earthquake 2001 local organizations and civil society groups were actively engaged in relief and rehabilitation work. A local network organization Abhiyan worked promptly in providing information to local people, public agencies and organizations after the Gujarat earthquake 2001. During the Tsunami disaster 2004 Abhiyan was again engaged in helping local NGO's in Tamil Nadu to setup similar network to convey information to affected people and relief operators<sup>173</sup>.

Civil society groups are engaged in bringing good practices for disaster preparedness and capacity building of the communities affected by disasters. Disaster brings with itself the downside risk that may push poor people and vulnerable communities into extreme poverty. This requires removing of underlying threats and insecurities that vulnerable people experience. As a result response after disaster becomes necessary. The civil society helps in undertaking capacity "building exercise" for the communities impacted by disasters, to develop social capital and community empowerment to recover and reconstruct the affected lives and to recover development gains lost due to natural calamities<sup>174</sup>.

This brings up the “bottom-up” approach and community based disaster management practices to be put into effective usage. India being a multi-hazard prone country empowering and enhancing the capacities of the communities in the states may be optimally achieved through bottom-up approach with the state governments acting as facilitators in the empowerment and capacity building of the communities<sup>175</sup>. India has been moving towards the next stage of disaster management where a “collaborative approach” has to be adopted to make it more effective and performance oriented. The community based disaster risk reduction programmes are being conducted to build resilience of the communities to handle impacts of disasters and “building back better” keeping the post- 2015 disaster framework applicable in the context of disaster scenario.

The questionnaire survey carried for this purpose also substantiates the fact that for long term sustainability, disaster management policies and practices must be strengthened to bring in the desired result. It has been observed during analysis on the question of the role of the state in India in addressing disaster vulnerabilities 65% of the total respondent agreed that to a greater extent all the stakeholders and particularly the state is the major component of disaster risk reduction in India. Interestingly quite few of the respondents were of the opinion that mainstreaming of disaster management in plans and policies have been rather slow and segregated response of the state to disaster events.

While analysing the opinion survey on the effective system of governance in addressing disaster vulnerabilities 66% of the respondents expressed that disaster events bring out the governance capacity of the state and functioning of the government in the public sphere which at times has been less than effective. The opinion survey clearly spelt out the role of the civil society

organizations in disaster management in India. 62% of the respondents were of the opinion that the civil society organizations are very active during and after disaster events and 58% of the respondents agreed that civil society in India works more successfully in creating awareness on disaster issues and help in capacity building of the communities impacted by disasters.

Against the above backdrop in **conclusion** it could be stated that the perception and analysis of various existing plans, policies and mechanisms related to disaster management in India brings forth the structural and non-structural framework that has been applied to address the issue of disaster management. This has been done in the light of specific case studies taken up in this chapter to be addressed for specific analysis. In this context it could be stated that both policy and institutional-structural level mechanisms are effective measures to deal with the devastating impact of multiple disasters almost faced every year by the country.

The recent occurrences of disasters have once again brought to the forefront risks and vulnerabilities associated with disasters. As such disaster mitigation and preparedness has a long way to go in case of India. An integrated approach must be applied to get better results. India has to move from 'relief and response' to 'mitigation and preparedness' to obtain effective results in the field of disaster management which has been rather slow in all these years. Alternative perspectives of disaster management must be incorporated to complement the dominant 'top-down' approach. This process also entails bringing in the issue of governance to the forefront for clear distribution of tasks, transparency, direct communication, accountability and enforcement of responsibility to those associated with the task of disaster management.

In India multi-stakeholder participation involving local government and local people in the process of decision making is one way forward thereby ensuring the role of civil society in

informed decision making process. To systematically address the issue of disaster management henceforth a “collaborative approach” must be adopted to bring in multi stakeholder engagement and participation to develop a working system of disaster management.

The task of the next chapter therefore is to bring out a comparative study of the status of disaster management system in Bangladesh and India so that an informed perspective could help in bringing out better policy outcomes in both the countries. Both Bangladesh and India needs to address disaster issues to strengthen sustainable development and human security concerns.

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## *CHAPTER VII*

### *Status of Disaster Management in Bangladesh and India: A Comparative Study*

#### *Introduction*

Bangladesh and India embedded in the South Asian region exhibit commonalities and divergence in the realm of society, culture, economics and politics. The South Asian region can be aptly described “as a practical geographical area having a number of states within it which are objectively reorganized as constituting a distinctive community within the global system”. The region is also characterized by considerable internal diversity, linguistic differences as well as a range of distinctive political systems<sup>1</sup>. It is within this well defined geopolitical arena with a shared social, cultural and civilizational past and a colonial history that various challenges and ‘threats’ needs to be addressed for a deeper understanding impacting sustainable development and human security concerns in both the countries.

Bangladesh and India well established within the region of South Asia has continued to evolve and change with times. India as a nation state emerged on the international scene following the anti-colonial movement and struggle for freedom with partition from British colonial rule. India became the largest and most powerful country in South Asia with the realization of its dominant position in the Indian sub-continent, due to its sheer natural position of regional predominance as a result of its size, population and relative power in comparison to the other states in South Asia<sup>2</sup>.

India was the first country to recognize Bangladesh as a separate and independent state and established diplomatic relations with the country immediately after its independence in December 1971. The emergence of Bangladesh after decades of people’s struggle had established a ‘Bengali identity’ in the South Asian region. This also generated expectations from

the new state both internally and externally to deliver socio-economic and political change<sup>3</sup>. India's links with Bangladesh are civilizational, cultural, socio-political and economic. There is much that unites the two countries, a shared colonial history and a common heritage, linguistic and cultural ties, passion for music, literature, arts, and the history of natural disasters.

Geography plays an important role in determining the contextual space of a country that makes a nation. To put it contextually K.J. Schmidt remarks “geography has a significant effect on the overall development of human cultures”. The unique geo-political location of India and Bangladesh within the Indian sub-continent makes it highly vulnerable to natural disasters<sup>4</sup>. India and Bangladesh situated within the broader region of the Indian-Sub continent comprises a geographically distinct sub-system within the international system geo-physically complementing each other. The geographical position of both the countries and its relation with ecology and human settlement also has a far reaching impact on the process of sustainable development in the region. This also presents an opportunity to understand the vulnerability scenario in terms of geophysical location and socio-economic conditions faced by both the countries in case of natural disasters<sup>5</sup> that has impacted the development process in the region and more so in case of Bangladesh.

### ***Comparative Overview of Natural Disaster Scenario in Bangladesh and India***

Bangladesh is a land of natural disasters. From time immemorial Bangladesh has been one of the most effected countries in South Asia from natural disasters<sup>6</sup>. A country more prominently known for under development, poverty and natural disasters, Bangladesh's history and lives of its people has been shaped by the geological history of the deltaic plain at the confluence of the Ganges (Padma) Brahmaputra (Jamuna) and Meghna Rivers. The geopolitical and ecological



setting and the regular occurrence of natural disasters has exposed the countries to varied problems of development.

The geo-physical location of Bangladesh makes it highly vulnerable to natural disasters. At present Bangladesh appears to be the most vulnerable, fragile and disaster prone country with greatest disaster risk ranking index of 168 in the world according to the World Disaster Risk Index Report 2013. Bangladesh faces at least one major disaster a year. It lost on an average of 3.02 percent of its GDP every year during the last 10 years and holds the highest mortality rate<sup>7</sup>.

The United Nations Development Program (UNDP) Report 2004 has ranked Bangladesh the number one nation at risk for tropical cyclone and number six for floods<sup>8</sup>. During 1990-2008 the annual loss was of US\$ 2,189 million (1.8% of annual GDP) from disasters and the average annual death toll was 8241 i.e. 6.27 percent per one hundred thousand inhabitants<sup>9</sup>. The following table 7.1 presents a clear scenario of the major disasters impacting on Bangladesh.

**Table 7.1: Major Natural Disasters Statistics in Bangladesh (1907-2004)**

<i>EM-DAT Information (1907-2004): Disaster</i>	<i>Number of Events</i>	<i>Total Killed</i>	<i>Average Persons Killed</i>	<i>Total Persons Affected</i>	<i>Average Persons Affected</i>
<i>Cyclone</i>	<i>137</i>	<i>614,112</i>	<i>4,483</i>	<i>63,817,281</i>	<i>465,820</i>
<i>Drought</i>	<i>5</i>	<i>18</i>	<i>4</i>	<i>25,002,000</i>	<i>5,000,400</i>
<i>Earthquake</i>	<i>6</i>	<i>34</i>	<i>6</i>	<i>19,125</i>	<i>3,188</i>
<i>Flood</i>	<i>64</i>	<i>50,310</i>	<i>786</i>	<i>369,678,156</i>	<i>5,776,221</i>
<i>Volcano</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>	<i>-</i>

*Source: Ref: The Earth Institute, Centre For Hazards And Risk Research Columbia University "Bangladesh Natural Disasters. Profile.1. Available at <http://www.ideo.columbia.edu> [Accessed on 15 May 2015 at 8.57 p.m.]*

In terms of disaster similarities India also presents a history of disasters. Traditionally India has been one of the most affected countries by natural disasters in the South Asian region. The geopolitical and ecological setting and the regular occurrence of natural disasters has exposed the countries to the problems of development<sup>10</sup>. According to the vulnerability profile, India appears to be one of the most vulnerable, fragile and disaster prone countries in the world with greatest disaster risk ranking index of 100 and disaster risk percentage of 7.17% at global level according to the World Disaster Risk Index Report 2013<sup>11</sup>.

According to the Vulnerability Profile Atlas Map of India (2006) India is vulnerable in varying degrees to large number of disasters. Almost more than 58.6% of the landmass is prone to earthquakes ranging from moderate to high intensity, over 40 million hectares (12%) of its land is prone to floods and river erosion, out of 7516 km vast coastline, about 5700 km is prone to cyclones and tsunamis, 68% of the cultivable area is vulnerable to droughts and hilly area of the sub-Himalayan range and Western Ghats are at risk from avalanches and landslides<sup>12</sup>.

India is more than 1.2 billion people, face at least one or more forms of natural disasters per year. It has experienced the highest number of disasters with an increasing trend in terms of events and casualties during the past four decades from 1970-2009. According to the global database of disasters, as estimated by Sapir- Debarati Guha, India ranks third in the number of disaster events, second in number of disaster victims and fifth in economic damage due to natural disasters<sup>13</sup>. According to World Bank Report in 2003, India's annual loss to disasters was estimated to close to 2% of Gross Domestic Product (GDP) and upto 12% of central government revenues<sup>14</sup>. The following table 7.2 presents a clear picture of major disasters impacting on India:

**Table 7.2: Major Natural Disaster Statistics in India (1970-2009)**

<i>Disaster Type</i>	<i>Total Disaster</i>	<i>Total Casualties</i>		<i>Total Affected People</i>	
		<i>Total</i>	<i>Annual</i>	<i>Total US\$</i>	<i>Annual</i>
<i>Earthquake</i>	<i>20</i>	<i>50,000</i>	<i>1280</i>	<i>28 million</i>	<i>715,000</i>
<i>Flood</i>	<i>192</i>	<i>48,000</i>	<i>1230</i>	<i>783 million</i>	<i>20 million</i>
<i>Drought</i>	<i>9</i>	<i>320</i>	<i>8</i>	<i>961 million</i>	<i>25 million</i>
<i>Landslide</i>	<i>37</i>	<i>3,200</i>	<i>83</i>	<i>3.8 million</i>	<i>98,000</i>
<i>Cyclone</i>	<i>113</i>	<i>49,000</i>	<i>1260</i>	<i>84 million</i>	<i>2.2 million</i>
<i>Total</i>	<i>371</i>	<i>151,000</i>	<i>3860</i>	<i>1.86 million</i>	<i>48 million</i>

*Source: Ref: EM-DAT, 2010 Accumulated figures as presented in the World Bank Report (2012) "Disaster Risk Management in South Asia: A Regional View" World Bank. GFDRR. Washington. [Accessed on 05 May, 2015 at 12.04 p.m.] pp 65*

From a comparative analysis of the above tables (7.1) and (7.2) it is quite clear that floods, cyclones and earthquakes are the major disasters followed by landslides, droughts and others that impact the socio-economic level of development both in Bangladesh and India. The number of events is highest in case for floods followed by cyclones and the percentage of people killed and affected is much higher in case of floods and cyclones as well as earthquakes compared to landslides and droughts. Both India and Bangladesh face highest incidence of cyclone and floods and highest number of people affected by these two major natural hazards.

Bangladesh faces highest incidence of cyclone events compared to floods but the number of people affected is more by floods than by cyclones. In India highest incidence of flood events are noted and the number of people affected and losses incurred is more in case of flood and cyclone events than compared with other disaster type. Even the average number of people affected by floods is higher than compared to other events of natural disasters. This vulnerability is further

aggravated due to the geographical location of the region, low level of economic development, undeveloped infrastructure, lack of early warning systems and emergency preparedness, low capacity for adaptation, and poor management of relief and rehabilitation in the aftermath of a disaster.

A comparative assessment of two major disasters namely-flood and cyclone in India and Bangladesh reveals the disaster scenario and helps in bringing out the status of disaster management in both the countries. Floods continue to be a major hazard in Bangladesh and management of floods has been the major pre-occupation of the people and the state. Floods could be considered as the major natural disaster that impacts Bangladesh.

An analysis of the deltaic flood plains of the GBM Basin also reveals that the land Bangladesh occupies makes it subjected to regular floods as it lies in the catchment area of the GBM Basin which occupies 7.5 percent of this catchment area (130,000 kilometre square). In addition, the south-east flood plains an area approximately of 6000 kilometre square that lies outside the GBM catchment area is also subjected to floods<sup>15</sup>.

Bangladesh is regularly affected by river floods impacting twenty-eight percent of the country in normal years and increasing 68 percent in extreme years. Between the period of 1950-2000, sixteen major floods have impacted Bangladesh<sup>16</sup>. Particularly the reported floods of 1988, 1998, 2004 and 2007 have been considered as most catastrophic in terms of large scale destruction and loss of lives<sup>17</sup>. The impact of these disasters has been enhanced by the fact that about 40 percent of the population still lives below the poverty line<sup>18</sup>. The comparative assessment of major floods in Bangladesh below shows the intensity of loss and damages incurred and its impact on the

development scenario of the country. Table 7.3 presents the trends in flood damages in the last three decades.

**Table 7.3: Trends in flood damages in the last three decades in Bangladesh**

<i>Year of Flood</i>	<i>Innundated Area In Square Kilometer</i>	<i>Damages (Total) In Million Us \$</i>	<i>Total No of Deaths</i>
<i>1984</i>	<i>50,000</i>	<i>380</i>	<i>Na</i>
<i>1987</i>	<i>50,000</i>	<i>1000</i>	<i>2050</i>
<i>1988</i>	<i>85,000</i>	<i>1200</i>	<i>2000-6500</i>
<i>1998</i>	<i>1,00,000</i>	<i>2800</i>	<i>1100</i>
<i>2004</i>	<i>55,000</i>	<i>2000</i>	<i>747</i>
<i>2007</i>	<i>32,000</i>	<i>1000</i>	<i>650</i>

*Source: Ref: Sixth Five Year Plan (2011-2015) Accelerating Growth and Reducing Poverty. Part 3- Statistical Annex and Technical Framework, General Economics Division, Planning Commission, Ministry of Planning, Government of the People's Republic of Bangladesh. [Accessed on 29 September 2015]. pp 52*

In case of India floods are becoming an annual feature recurring in nature that has made the country more vulnerable to flood disasters. According to India Disasters Report 2011 annually it is estimated that 32 million people and thousands of livestock are affected and nearly sixty percent (60%) of the flood damage in the country occur from river floods and remaining forty percent (40%) by flooding due to cyclones and heavy rainfall<sup>19</sup>. In the Himalayan river basin about 66% of the damage is due to floods. The state of Uttar Pradesh accounts for (33%) of flood damages in the country followed by Bihar (27%) and Punjab and Haryana (15%) followed by Assam and West Bengal<sup>20</sup>.

India situated within the GBM basin accounts for the worst flood affected areas of the country accounting for 60% of floods. The analysis of the GBM river basin reveals the trans- boundary river system with a total area of 1.7 million sq. km. occupied by India (64%), China (18%),

Nepal (9%), Bangladesh (7%) and Bhutan (3%) that is annually washed away by floods during monsoon<sup>21</sup>. The Indian states of Bihar, West Bengal, Orissa and Assam face flood as a recurrent phenomena every year particularly the eastern and north-eastern are hit by worst floods cause by a number of factors both natural (heavy rainfall) and man-made such as deforestation in the Himalayan and plan region, excessive siltation of the river bed, human inference due to growing population, inadequate drainage capacity and natural denundation<sup>22</sup>.

Associated with this is the critical problem of a large and growing population and poverty in the country. The impact of these disasters are aggravated by the fact that still 27% of the population lives below the poverty line generating exposure to vulnerabilities and risks associated with settlements in low lying areas and vulnerable areas that indirectly impacts sustainable development<sup>23</sup>. The following table 7.4 shows the trends of flood damages in India.

**Table 7.4: Trends in Flood Damages in India during the Current Period (2000-2008)**

<i>Year</i>	<i>Total area Effected (in m.ha.)</i>	<i>Cropped area (in m.ha.)</i>	<i>Population Effected (in Millions</i>	<i>Cattle lost (Nos)</i>	<i>Human lives Lost (Nos)</i>	<i>Damages</i>
<i>2000</i>	<i>5382</i>	<i>3580</i>	<i>45.01</i>	<i>123252</i>	<i>2606</i>	<i>268855</i>
<i>2001</i>	<i>6175</i>	<i>3964</i>	<i>26.46</i>	<i>32704</i>	<i>1444</i>	<i>716817</i>
<i>2002</i>	<i>7090</i>	<i>2194</i>	<i>26.32</i>	<i>21533</i>	<i>1001</i>	<i>762492</i>
<i>2003</i>	<i>6503</i>	<i>3426</i>	<i>34.46</i>	<i>16425</i>	<i>1864</i>	<i>846920</i>
<i>2004</i>	<i>8031</i>	<i>2693</i>	<i>34.21</i>	<i>63869</i>	<i>1275</i>	<i>1492814</i>
<i>2005</i>	<i>12,190</i>	<i>15.18</i>	<i>32.07</i>	<i>124930</i>	<i>2232</i>	<i>682593</i>
<i>2006</i>	<i>0.495</i>	<i>0.433</i>	<i>28.57</i>	<i>8932</i>	<i>1500</i>	<i>737355</i>
<i>2007</i>	<i>3.459</i>	<i>6.31</i>	<i>41.46</i>	<i>70650</i>	<i>2439</i>	<i>1686135</i>
<i>2008</i>	<i>0.000</i>	<i>1.70</i>	<i>19.21</i>	<i>17214</i>	<i>2143</i>	<i>914251</i>

*Source: Ref: Central water Commission Annual Report 2000-2008 as quoted in India Disaster Report II. pp 206*

A comparative assessment of cyclone scenario in Bangladesh and India reveals that cyclone disaster impacts both the countries to an extreme level, causing destruction, loss of lives and property that occur regularly with varying frequency and intensity. Cyclones and storm surges appears to be the most recurrent feature with increasing intensity in Bay of Bengal (eastern coast) and Arabian Sea (western coast of India) causing immense damage to the environment and economy<sup>24</sup>.

The Eastern Coast of India has a long history of devastating cyclones. The cyclone of 1970 (Bhola) that hit Bay of Bengal totally swamped low lying coastal regions of Bangladesh, India and Burma. An estimated 300,000 – 500,000 lost their lives. The worst cyclone that has hit India and the eastern coast since 1990 was the Great ‘Super Cyclone’ Orissa 29<sup>th</sup> October, 1999 left behind a trail of devastation that has no parallel in the country with past records<sup>25</sup>.

A comparative assessment of major cyclones has been presented in the following Table 7.5 to address the vulnerability scenario of cyclone disasters in Bangladesh.

**Table 7.5: Cyclone Damages in the last four decades in Bangladesh**

<i>Year and date of cyclone</i>	<i>Maximum speed in km/hr</i>	<i>Storm surge height in metres</i>	<i>Number of people killed</i>
<i>12<sup>th</sup> November 1970 (BHOLA)</i>	<i>224</i>	<i>6.0-10.0</i>	<i>300,000</i>
<i>25<sup>th</sup> May 1985</i>	<i>154</i>	<i>3.4-4.6</i>	<i>11,069</i>
<i>29<sup>th</sup> April 1991 (GORKY)</i>	<i>225</i>	<i>6.0-7.6</i>	<i>138,882</i>
<i>19<sup>th</sup> May 1997</i>	<i>232</i>	<i>3.1-4.6</i>	<i>155</i>
<i>15<sup>th</sup> November 2007 (SIDR)</i>	<i>223</i>	<i>Upto 10.0</i>	<i>3363</i>
<i>25<sup>th</sup> May 2009 (AILA)</i>	<i>92</i>	<i>N.A</i>	<i>190</i>

*Source: Ref: Bangladesh Meteorological Department 2007, National Plan for Disaster Management (2010-2015) Disaster Management Bureau, Disaster Management & Relief Division April 2010. Government of the People’s Republic of Bangladesh. [Accessed on 16 May, 2015]. pp 8*

An examination of the current trends reveals that cyclones have also become an annual affair for India. The most recent cyclones that has hit India are Cyclone Nisha (2008) Tamil Nadu, Cyclone Phyan, Maharashtra(2009), Cyclone Jaba (2010) affected the districts of Ganjam and Jagatsinghpur (Orissa), Cyclone Aila (2009) hit Bangladesh and West Bengal, Cyclone Laila (2010) affected Andhra Pradesh, Cyclone Thane (2011) affected areas of Cuddalore (Tamil Nadu) and Pondicherry, Cyclone Nilam (2012) Mahabalipuram district and Chennai (Tamil Nadu), Cyclone Phailin (2013) affected Orissa and Andhra Pradesh, Cyclone Hudhud (2014) had badly affected Orissa, Andaman & Nicobar Islands<sup>26</sup>. The following table 7.6 presents the trend of cyclone disaster in India in the last four decades.

**Table 7.6: Cyclone Damages in the last four decades in India**

<i>Year</i>	<i>Cyclone Name</i>	<i>States Affected</i>
<i>1990 (May 1990)</i>	<i>B0B01</i>	<i>Andhra Pradesh</i>
<i>1999</i>	<i>B0B06</i>	<i>Odisha</i>
<i>2008 (Nov. 26, 2008)</i>	<i>Nisha</i>	<i>Tamil Nadu</i>
<i>2009</i>	<i>Phyan</i>	<i>Maharashtra</i>
<i>2010 (Aug. 9, 2008)</i>	<i>Laila</i>	<i>Andhra Pradesh</i>
<i>2010 (July 11, 2010)</i>	<i>Jal</i>	<i>Tamil Nadu</i>
<i>2012 (Oct. 13, 2012)</i>	<i>Nilam</i>	<i>Andhra Pradesh, Tamil Nadu</i>
<i>2013 (Oct. 11, 2013)</i>	<i>Phailin</i>	<i>Odisha</i>
<i>2013 (Nov. 25, 2013)</i>	<i>Lehar</i>	<i>Andhra Pradesh</i>
<i>2013 (Nov. 21, 2013)</i>	<i>Helen</i>	<i>Andhra Pradesh</i>
<i>2014 (Oct. 12, 2014)</i>	<i>Hudhud</i>	<i>Odisha</i>
<i>2014 (Oct. 31, 2014)</i>	<i>Nilofar</i>	<i>Gujarat</i>

*Source: [www.mapsofindia.com/maps/india/cyclone\\_prone\\_areas.html](http://www.mapsofindia.com/maps/india/cyclone_prone_areas.html). [Accessed on 20February, 2016]*

The above scenario clearly indicates that natural disasters are a major source of insecurity to the people of both the countries. The impact of disasters is all encompassing as such any policy and mechanisms to deal with management of disasters must be all pervasive and holistic in nature.



The major objective of the state should be to reduce disaster vulnerabilities of the people especially the poor and the marginalized which requires management of disaster at all levels of governance. This also requires the all pervasive role of the state, community, civil society and other stakeholders to address and understand the status of disaster management in both the countries.

### ***Status of Policy Matrix on Disaster Management in Bangladesh and India***

Natural Disasters cannot be prevented but damages can be mitigated with adequate planning and adaptation which is dependent on legal-institutional mechanisms for this purpose. Disaster management requires huge resources for mitigation, recovery and preparedness to be integrated into national policy and planning to mitigate negative consequences and impacts on the people, community and economic development of the country concerned.

The status of disaster management in Bangladesh and India analyzed from the perspective of policy response at the state level and case study analysis have already shown that management of disasters had always been sectoral and segregated approach in both the countries. With each disaster event dealt separately generating separate response both at the policy and institutional level such as in the case of floods and cyclone disasters, a comprehensive and holistic approach to disaster management was always lacking in both the countries. The state in the past had a traditional reactive approach to disaster that was confined to emergency relief and response and less focus on preparedness and mitigation efforts to build resilience of the communities to disasters.

It is pertinent to mention in this context that the disaster management framework in Bangladesh and India since independence had a more conventional response of ‘relief and rehabilitation’

towards disaster. This reflected a reactive approach to natural disaster management focusing only on “emergency relief” or “relief-centric” policy towards disaster. After the Tsunami 2004 experience though security of the people constituted an important aspect of disaster management in India and Bangladesh, the uncoordinated exercise in addressing natural disasters led to a rethinking of disaster management policy from human security perspective. The early 2000s witnessed a process of change in disaster management approach particularly resulting in a paradigm shift from the conventional response of ‘relief and rehabilitation’ to ‘preparedness and mitigation’ to strengthen the disaster management scenario.

The disaster management framework has undergone a long and vigorous process of significant transformation highlighting the integration of disaster management into various plans, policies, mechanism and legal-institutional framework in both the countries. This was in consistent with Agenda 21 of the Rio Declaration adopted at the UNCED 1992 and subsequently at the Yokohama Strategy and “Plan of Action for a Safer World” 1994 that recognized disaster management as part of sustainable development agenda and a concern for human security<sup>27</sup>.

Following the Hyogo Framework for Action (2005-2015), Bangladesh and India were required to develop a framework emphasizing disaster risk reduction and strengthening emergency response system for disaster management<sup>28</sup>. Further being part of the South Asian region both the countries have joined the SAARC Framework of Action (2006-2015) for Comprehensive Disaster Management and Emergency Preparedness in the field of disaster management<sup>29</sup>.

A deeper analysis of the disaster management framework reveals that **Bangladesh** has been moving towards a more workable system of disaster management. The process entails inclusion of policies and mechanisms to develop a legal-institutional framework by mainstreaming disaster

management into development perspective. This also brought out the support of various stakeholders to develop a comprehensive framework for management of disaster. Included in this process was the support of various multilateral organizations, international and national non-governmental organizations playing a collaborative role in this direction<sup>30</sup>.

The initial effort to address disaster management in case of Bangladesh began with the Comprehensive Disaster Management Programme (CDMP) adopted in two phases (CDMP): Phase I (2004-2009) and Phase II (2010-2014) It was developed as a high profile multi-hazard, multi-sector and multi-stakeholder program, by the Government of Bangladesh in collaboration with the United Nations Development Program (UNDP), the UK Department for International Development (DFID) and the European Union and formally executed by the Ministry of Food and Disaster Management, Government of Bangladesh<sup>31</sup>.

The aim of the CDMP was to establish the mechanisms that would facilitate long term management of disaster, climate risk and socio-economic development as part of national plan and development policy. This reflected a proactive approach towards disaster management including hazard identification and mitigation, community preparedness and integrated response towards disaster. The programme was undertaken to strengthen the institutional structures guided towards management and disaster risk reduction<sup>32</sup>.

The major focus of CDMP Phase II was to integrate the risk of climate change into disaster management by strengthening capacity building at household and community level through Community Level Risk Assessment (CRA) and Risk Reduction Action Plan (RRAP) Program that ensures the involvement of the community through participatory process. These programs act as a participatory and inclusive tool in bringing benefit at the community and household level

by mainstreaming disaster risk reduction in cost effective manner in national plans and policies for long term sustainable development<sup>33</sup>.

The National Plan for Disaster Management 2010-2015 (NPDM) envisioned in April 2010 was the next effort to establish the planning and regulatory framework identifying the priority areas for emergency response and disaster risk reduction. An analysis of NPDM brings forward the detailed and systematic structural outline for disaster risk reduction at all levels of governance. The NPDM also helps in bringing out disaster management plans at the district and local levels of governance level<sup>34</sup>. It has also addressed hazard specific multi-sectoral plans such as Earthquake Contingency Plan, Cyclone Shelter Plans, Disaster Resilient Cluster Housing and Tsunami Response Plan (after the December, 2004 Indian Ocean Tsunami) <sup>35</sup>. The legal-institutional framework for disaster management in Bangladesh was established with the enactment of Disaster Management Act 2012 that created the legal-institutional framework, representing a hierarchical structure from the national to the local level to provide guidance towards disaster risk reduction and emergency response in disaster related issues<sup>36</sup>.

Given the current scenario the process of disaster mitigation has been rather slow due to the extreme geophysical and socio-economic vulnerability, low level of economic development and governance scenario of the country. Moreover the hierarchical structure of disaster management framework brings in a top-down approach that require further enlargement to include all the stakeholders and people affected by disaster.

Further analysis reveals that disaster management was initially not included in the plan documents as each disaster event was addressed on “ad hoc basis”. From Fifth Five Year Plan (1997-2002) the sustainable environment management project towards implementing sustainable

development initiatives for protecting environmental degradation, climate change and disaster management was incorporated<sup>37</sup>. Particularly from the Fifth Plan onwards allocation of funds were made ministry wise and sector wise for areas covering environment, forestry, climate change and disaster management to be carried forward during the sixth plan period (2011-2015).

The government expenditure on disaster management has increased in all these years. Yet the amount is negligible compared to post disaster reconstruction required on massive scale with support coming in the form of soft loans from multi-lateral financial institutions. There is surely a large gap to be fulfilled regarding existing arrangement of financing disaster management in Bangladesh.

Comparative assessment of the disaster management framework reveals that in **India** disaster management has emerged as a new concept which involves incorporating a more workable system to include into various plans, policies, and mechanisms for developing a legal-institutional framework to mainstreaming disaster management into development perspective. The exposure and experience from the past mega disasters has brought disaster management to the forefront of India's development agenda.

Given India's vulnerability and exposure to disaster a gradual but consistent paradigm shift in India's policy or disaster management from the conventional response of 'relief and rehabilitation' to a more holistic approach of disaster risk reduction ensuring the resilience of the community to hazards and calamities has been undertaken to mitigate disaster risks. This new approach proceeds from the conviction that development cannot be sustainable unless disaster mitigation is built into the development process<sup>38</sup>.

It is pertinent to mention that the systematic response had already started from the 1990s when the United Nations declared the 1990s as the International Decade for Natural Disaster Reduction<sup>39</sup> resulting in a permanent disaster management cell being established under the Ministry of Agriculture, Government of India. In August 1999, a High Powered Committee (HPC) was constituted to review the existing mechanism for disaster preparedness and mitigation and measures to strengthen these mechanisms at the national, state and district levels<sup>40</sup>.

In 2004, the Government of India came out with a Status Report on disaster management that laid the foundation for a more comprehensive and holistic approach towards disaster management in India. It created a framework and a road map for working upon concrete legislations to be formulated for disaster management in India<sup>41</sup>. This development culminated in the enactment of Disaster Management Act 2005 that laid down the legal-institutional set up for the management of disaster with proper organization set up complimenting the legal-institutional system of disaster management in India<sup>42</sup>.

The legal-institutional framework of disaster management represented a hierarchical structure from national to the local level to provide guidance towards disaster risk reduction and emergency response. The hierarchical, bureaucratic top-down approach of the Act gives the administrative authorities sweeping powers at all levels of governance (central, state and district level) with limited role for the local representatives.

Given the current scenario the process of disaster mitigation has been rather slow and lax because not all the states of India till date have been able enough to frame disaster management plan in their respective states. The Comptroller and Auditor General Report (CAG) 2013 in the context of Uttarakhand flash flood disaster (2013) acknowledged the fact that disaster

management framework needs to be strengthened to bring in proper attention in the field of disaster issues<sup>43</sup>.

An analysis of plan documents of India reveals very clearly like in the case of Bangladesh that initially disaster management was not included in the plan documents as each disaster event was addressed on “ad hoc basis”. Five Year Plan documents did not consider issues relating to the management and mitigation of disasters as significant enough that warrants scientific and methodological outlook.

The traditional perception has been limited to the idea of “calamity relief” which was essentially categorized as non-plan expenditure. It was only from the Tenth Five Year Plan (2002–2007) that disaster management was mainstreamed in the planning process and a separate section on disaster management was included to address this issue. The Tenth Plan document recognized for the first time that development cannot be sustainable without mitigation being built into the development process. As a result disaster mitigation and prevention were adopted as essential components of development strategy<sup>44</sup>.

In the context of the above policy matrix and mechanisms pursued both in Bangladesh and India it is quite proper to mention that management of disaster has been a challenging effort in both the countries. Various disaster events have time and again reflected the shortcomings of disaster management in the countries concerned. Particularly in the context of Bangladesh and India, the case studies have reflected the shortcomings of disaster management with successive and recurrent disaster events.

Drawing from the above discussion it is quite natural to highlight disasters mitigation and preparedness of both the countries to test the efficacy of preparation at the country level.

Analysis of the mitigation and preparedness scenario brings into sharp focus the task of the administration and governance scenario. To bring out an integrated disaster risk mitigation programme as part of the sustainable development agenda future threats and vulnerabilities must be addressed in a systematic way to bring desired results.

### ***Current Status of Disaster Management in Bangladesh***

During the last forty five years the country has adopted and evolved continuously strategies, mechanisms and policies to mitigate the vulnerabilities associated with disasters (flood and cyclone) generating mixed experiences. The initial strategy for flood control measures followed till the 1970s-1980s by the successive governments with assistance from international donor partners was to strengthen the drainage and irrigation projects including building embankments along big and mighty rivers flowing into Bangladesh<sup>45</sup>.

Till 1988, 7,500 km of embankments had been built along the Ganga, Brahmaputra, Meghna and Teesta rivers that consumed 10% of the Annual Development Plans of the government. Successive floods followed annually and the flood control measures were not successful in containing the flood and human security concerns. The catastrophic floods of 1987, 1988 again renewed the government and donor partner commitment to flood protection through structural measures that culminated into Flood Action Plan (FAP) in 1990s<sup>46</sup>.

The FAP generated a lot of negative concerns from the political, social, environmental and public platforms due to the consequences that entailed, by this large scale structural project. The FAP was an ambitious programme to control and manage floods in the major river systems of the country with an important clause of people's participation in water management projects and



their right to information<sup>47</sup>. The civil society organizations started their protest when they felt that their voices were being ignored by the FAP project.

According to Rounaq Jahan, “the FAP generated reactions at home and abroad”. The initial protest was launched by the women associated with the Unnayan Shahojogy Team a civil society organization in Gala union in Tangail town working for the empowerment of rural women culminating into a bigger demonstration including a number of other civil society organizations and local citizens. Later this protest even spread to the European civil society organizations, to those countries who were donor partners of the FAP project especially putting pressure on the policy makers of their respective countries to call for community participation in all phases of flood control project<sup>48</sup>.

The FAP was further critiqued as an unrealistic and expensive scheme that agencies like World Bank have pushed on third world countries without a realistic appraisal of the ground reality in the country concerned and in this case Bangladesh<sup>49</sup>. Another drawback highlighted the limitation of the project for not taking into account the environmental concerns and human made ecological disaster. In this context the contribution of Bangladesh Environmental Lawyers Association (BELA) was quite forthcoming. BELA had been actively involved on the legal front to build pressure on the government to address the environmental sustainability and feasibility of the FAP project with respect to people’s participation clause and establishing the role and importance of community participation in the decision making process<sup>50</sup>.

This also reflects a “defective polity” where political parties have not been effective in providing popular participation to the people in the political process and the void was filled by civil society activism and more so in case of Bangladesh. The FAP came to an end in 1995 highlighting the

fact that better policy measures were required to develop a more holistic approach towards flood management that also led to a more comprehensive outlook on the development of the country's water resources from an integrated perspective on floods<sup>51</sup>.

The Disaster and Emergency Response (DER) Post Floods Needs Assessment Report 2004 prepared in response to flood disaster recommended that the country needs to improve disaster response and preparedness at the local level capacity building must be engaged into the district level administration with provision of immediate rescue resources, emergency funding mechanisms with better information management and contingency planning<sup>52</sup>.

In a similar vein it has been skeptically noted that highly expensive and huge projects promoted and funded by various aid agencies to control river water have not been able to save Bangladesh from disastrous floods whose frequency has increased over the years. Regular occurrences of floods have reiterated that in the long run more emphasis is required on mitigating and managing future flood disasters to reduce the increasing vulnerability of the people through proper development programmes<sup>53</sup>. This call for a more integrated approach on management of disaster that requires mainstreaming disaster risk reduction in development plans and policies to strengthen the disaster management framework. The recent floods has once again shown that disaster mitigation and preparedness has a long way to go in case of Bangladesh

Similarly in case of cyclone disaster the initial policy response has been to adopt various structural measures by emphasizing on the building of cyclone shelters, cluster shelters and coastal embankments. To reduce the vulnerability of the coastal areas the strategy was to plant mangrove forest on land between the embankment and the shore line which was not received

positively by the local population due to their fears of being left outside the embankment areas for cropping purposes and also local dependency on sea fishing<sup>54</sup>.

Following the devastating cyclones of 1991 the state's initiative of structural measures to mitigate cyclone disasters in Bangladesh revealed a history of mismanagement and failure of the governance previous and present to protect the people (poor and landless) from becoming the worst victims of these periodic disasters. A comparative assessment of major cyclones (1991, 2007) in Bangladesh has shown that the intensity of loss and damages incurred and its impact on the development scenario of the country has increasing with each passing disaster.

The devastating cyclone of 1991 revealed the major drawbacks of the Cyclone Preparedness Programme Project in Bangladesh. The CPP prepared by the Government of Bangladesh and Bangladesh Red Crescent Society (BDRCS) was to develop structural response to cyclone disasters but the status of these measures were highly questionable as most of the cyclone shelters were not in the condition to be protect the people from disastrous impact of cyclone events<sup>55</sup>. The major limitations were building of cyclone shelter in remote areas, poor quality construction, back of provision for maintenance of cyclone shelters, most of the shelters built twenty years earlier had already become derelict and abandoned and at the same time revealing the crisis of governance<sup>56</sup>.

As such the natural disaster of 1991 could also be regarded as a "social and political disaster". Due to vulnerability of the population occupying char lands in the coastal areas, thousands of poor, landless and land poor peasants became exposed to the devastating cyclone and storm surges. This was not only a case of underdevelopment but also a case of social and political disaster and vulnerabilities other than "natural" in nature and context<sup>57</sup>.

After fifteen years another major cyclone Sidr 2007 had hit Bangladesh. The efforts undertaken for cyclone management reveal certain shortcomings and variations at all levels of governance. The post Sidr experience once again brought forward the biggest gap in post-disaster recovery efforts that exposed the lack of clarity in existing institutional mechanisms to manage housing recovery<sup>58</sup>. The post disaster housing recovery was not mandated to any one particular agency of the government. The overall management of disaster rest with the National Disaster Management Council headed by the Prime Minister. The responsibility of different ministries in housing recovery is not clearly mentioned in the main legal framework of disaster management and other legal instruments that guides disaster management system in Bangladesh<sup>59</sup>.

Contrary to the reports regarding information of approach of Cyclone Sidr by government agencies and private sectors (newspapers, media and others) not all people were aware of cyclone warnings (particularly fisherman who went fishing and did not hear the warnings prior to the landfall of the cyclone). Moreover the warning signals reach was uneven in the districts (Borgana and Pirojpur) that were badly impacted by Sidr besides other factors taken into account (like compliance with evacuation orders). Despite concerted efforts on part of the government there were lapses in cyclone warning and evacuation procedures which leaves the gaps to be filled in order to better prepare the coastal community in future for cyclone preparedness and management<sup>60</sup>.

The Report on Cyclone Sidr (2009) highlighted the need for improvement of disaster response and preparedness at the local level, capacity building must be integrated into the district level administration for proper maintenance of cyclone shelters as well as provisions for immediate rescue and evacuation and better information of impending disasters with short term contingency plan as well as long run mitigation, recovery and reconstruction must be generated to reduce the

increasing vulnerability of the people. The study further recommended for the development of a national recovery monitoring system, strengthening resource allocation and land tenure issues and develop a building code as well as to transfer technical knowledge to build resilient structures to the local people<sup>61</sup>.

The recurring cyclone disaster has once again reiterated that disaster management (has a long way to go in case of Bangladesh. The structural and non-structural measures must be incorporated to strengthen the cyclone preparedness programme and the need to move from recovery to reconstruct programme with the objective of “building back better” for sustainable development of the affected areas. Alternative strategies and mechanism must be incorporated to strengthen the dominant approach on disaster management where community participation must be ensured for constructive result though at time this may be impacted by power network relationships working during humanitarian assistance<sup>62</sup>.

Moreover to reduce the vulnerability of the community and assist sustainable adaptations to natural disaster, the government must strengthen the local administration and infrastructure particularly Union Parishads for engaging in relief operations (relief distribution, monitoring and evacuation) as well as strengthening other areas (such as communication, transport maintenance, embankments and multipurpose cyclone shelters) so as to establish a working relationship between Union Parishads (local level administrative unit) and Community Based Adaptation Committee (CBAC) in order to reduce vulnerability of the communities to cyclone disasters in Bangladesh. This makes the role of civil society imperative to create social awareness towards disaster preparedness of the people and the community at large<sup>63</sup>.

Drawing from the above analysis it has become quite clear that the impact of disaster is all encompassing and as such any policies and mechanisms to deal with management of disasters must be all pervasive and holistic in nature for comprehensive risk reduction and ensuring the resilience of the community to disaster. This change was quite visible in the current decade in disaster management approach resulting in a paradigm shift from the conventional response of ‘relief and rehabilitation’ to ‘preparedness and mitigation’ to strengthen the disaster management framework, sustainable development and human security concerns.

### ***Current Status of Disaster Management in India***

During the last sixty five years or more the country has adopted and evolved continuously disaster management strategies, mechanisms and policies to mitigate the vulnerabilities associated with disaster (flood and cyclone) generating mixed experiences. The initial strategy for flood control was more in the nature of “relief” and “relief work” on adhoc basis. The catastrophic flood occurrences saw a paradigm shift in independent India with a change in policy targeted towards “flood control” began to be pursued vigorously with the implementation of structural measures consisting of a combination of embankments, high dams, detention basins, improvements and construction of drainage channels with emphasis on flood protection measures to be taken in a systematic and planned manner<sup>64</sup>.

Contextually comparative assessments of recent flood occurrences (2004, 2005, 2009, 2012, 2013 and 2014) shows that flood are major events of disaster in India. The Kosi flood 2008 has once again subjected India to the most devastating floods experienced in the last 50 years that had started with a breach of Kusaha embankment just north of the border in South Nepal leading to one of the worst flood disasters in recent history<sup>65</sup>.

The damage caused by Kosi Flood (2008) is the highest in the last five decades of flood history in India highlighting the limitations of flood control measures undertaken for the Ganga-Brahmaputra-Meghna River Basin system through all these decades<sup>66</sup>. The Kosi breach embankment happened due to institutional dysfunction and governance deficit. The key issues relating to flood control measure reveals the failure of structural approach to flood control and institutional dysfunction with respect to the transboundary flood management<sup>67</sup>.

The transboundary dimension of the river Kosi has further created major challenges for flood management in India. The provisions of the Kosi Treaty of 1966 entrusts the main responsibility of maintaining the Kosi project with Government of Bihar, India and the upstream stake holder Government of Nepal providing only additional infrastructural support in the operation and management of the Kosi barrage. The cross border nature of major rivers in the GBM basin makes the “blame game” on both sides of the border convenient. Kosi being transborder in nature the problem of mistrust arise between upstream Nepal and downstream India with management powers residing with India<sup>68</sup>.

The institutional capacity of the government both at the centre and the state to manage the disaster was particularly challenged with the preceding large-scale flood of 2007 followed by the Kosi floods of 2008. The local and state government structures were not fully prepared for such a level of disaster. The Government of Bihar had already set up the Bihar State Disaster Management Authority (6<sup>th</sup> November 2007) and also adopted the Bihar State Disaster Management Policy in 2007 to strengthen the institutional capacity for disaster risk reduction in the state but available district level indicators show that institutional capacity lagged far behind as a whole that created the vulnerability scenario for such a large scale disaster<sup>69</sup>.

Similarly in the case of Uttarakhand flash flood disaster 2013, the gaps in policy and its implementation at the working level was quite visible. The capacity of the state authorities was extremely challenged during the massive flooding and landslide disaster of June 2013. Poor coordination between disaster management authorities amplified the extent of loss and damages. The Home Minister, Government of India Sushil Kumar Shinde who came down to Uttarakhand to review rescue operations admitted that there was utter chaos in the administration's approach to disaster management in the state. Moreover lack of coordination among the government agencies was hampering rescue operations. Even the state disaster management authority lacked coordination and direction to manage this extreme event<sup>70</sup>.

In August, 2012 only a year prior to the Uttarakhand disaster, flash floods have washed away the Himalayan region in Uttarkashi. However few lessons seem to have been learnt from that incident. Scientists have also noted that the continued and recurring flash floods, calls for a disaster management policy to be undertaken for the Himalayan terrain<sup>71</sup>. The Uttarakhand State Disaster Management Authority (USDMA) has not convened any meeting since it was first set up in 2007. Till 2012 it was yet to frame a disaster management plan. Even the Comptroller and Auditor General (CAG) Report of 2013 pointed out the policy gaps and lack of coordination among government departments and agencies associated with disaster management in the state. Communication gaps were also noted between central and state disaster management authorities and between district and local administration as seen in the case of Uttarakhand disaster<sup>72</sup>.

The reasons are many for this one calamity. Besides scientific explanations behind the cloud burst and torrential rainfall followed by heavy flash floods the high numbers of lives being affected by the disaster was also due to the fact that the event took place during the pilgrimage season that has triggered unplanned development by deluge of pilgrims annually. Moreover the



abuse of natural resources without caring for its consequences had led to this grave ecological loss and human disaster highly impacting sustainable development and human security concerns<sup>73</sup>.

The Water and Related Statistics Report 2015, Government of India has indicated that despite flood policy and flood control measures applied during the last sixty five years or more, the trend on flood damages is on the increase. The trend is even more pronounced in recent years when large population is being subjected to increasing flood prone areas. According to the First Five Year Plan Document (1951-56) the flood prone area was only 2.29 million hectares that rose to 31.58 million hectares in 2013. The damage to crops was wide range varying from Rs.5.87 crore in 1965 to Rs. 7307.23 crore in 2003. The total damage caused by floods is estimated to the tune of Rs.11095.14 crore during 2013<sup>74</sup>.

The trend in flood damages further indicates a shift in spread affect of flood prone areas. Besides the GBM river basin system already being impacted by flood disasters, floods have spread to several states in recent past. The distribution of damage has been wide spread with the worst hit states being Assam, Orissa, Bihar and West Bengal In the east, Maharashtra, Gujarat and Rajasthan In the west and Andhra Pradesh, Karnataka Kerala and Tamil Nadu in the south. The data clearly indicates that from the normally impacted Gangetic belt, floods have now spread to other parts of India<sup>75</sup>.

During Eleventh Five Year (2007-2013) it has been found that the maximum expenditure was incurred in the State of Bihar followed by Uttar Pradesh, Assam and the North – Eastern states, Andhra Pradesh, West Bengal, Orissa, Gujarat, Haryana and Manipur. These States accounted for around 79% of total expenditure on flood management in the eleventh plan period<sup>76</sup>.

The current scenario of flood disaster in India shows that no lessons have been learnt from past disaster events. This has once again highlighted the fact that flood management strategies in India are questionable and our preparedness level to face such events is far too inadequate. Each recurring flood disaster presents the same picture of helplessness and unpreparedness indicating the incapability of governance and gaps in policy matrix in disaster management.

Reflecting on the most multi-hazard status of disaster scenario in the country, cyclone is considered as next major natural disaster that frequently strikes the coastal areas of India. The coastal areas of Orissa, Tamil Nadu, Gujarat, Andhra Pradesh and West Bengal are mostly frequented by tropical cyclones. The Super Cyclone (Orissa)-1999 left behind a trail of devastation unparalleled in the in the history of cyclone events in India affecting the North Indian Ocean, Bay of Bengal and the Arabian Sea<sup>77</sup>.

Cyclone Aila (2009) is considered as one of the worst cyclones to hit India after the devastating cyclone of Super Cyclone Orissa 1999 impacting Orissa, West Bengal, Sikkim, Assam and Meghalaya in India and coastal areas of Bangladesh causing heavy damages, loss of life and property. Particularly Aila impacted the state of West Bengal and Sunderbans. Disaster had a disproportionate impact on the poorer sections of the population of Sundarbans Islands exposing the vulnerability of the people who remain socially and economically neglected<sup>78</sup>.

The institutional capacity of the government to manage the disaster in 2009 was highly challenged. The state and local government structures were not fully prepared for such a large scale disaster that hit the state after twenty years. The state government was extremely proactive in 'relief operations' in the immediate aftermath of disaster. But pre-disaster preparedness and mitigation approach was less forwarding and not significant. The disaster once again highlighted

the short term disaster relief approach adopted by the government instead of long term approach of disaster preparedness<sup>79</sup>.

The long term approach to disaster management needs to improve disaster response and preparedness at all levels of governance. Capacity building exercise must be engaged into district level and local level administration with proper policy and planning, with provision of immediate rescue, resource management and distribution, emergency funding mechanism with better information management and contingency planning.

Better coordination is required between the government officials and administrative setup with civil body organizations and non- governmental organizations as they are more equipped with local knowledge about the actual situation. Coordination with local organizations could help in distributing relief and rehabilitation in a more systematic way. In the long run more emphasis is required on mitigation and preparedness measure for managing future disasters and to reduce the vulnerabilities of the people by engaging in proper development plans<sup>80</sup>.

This long term approach was reflective in case of cyclone Phailin that hit Odisha's Gopalpur in Ganjam district on October 12, 2013. This time the state was better prepared to manage cyclone disaster. The Odisha State Disaster Management Authority (OSDMA) in cooperation with National Disaster Management Authority (NDMA) immediately responded. The disaster preparedness teams coming from the national level and state level respectively acted immediately by stationing the emergency response teams and supplies thereby evacuating nearly a million people to safer destinations. A major role was played by the National Disaster Response Force (NDRF), State Rapid Action Force, the military rescue teams and defense personnel to evacuate one million people<sup>81</sup>.

The success of minimizing human casualties was due to the proper functioning of the state administration and the preparedness of the Odisha State Disaster Management Authorities (OSDMA) to keep the casualties at the lowest level. The low loss of lives despite the severity of Phailin would not have been possible without incorporating and building upon the lessons learnt from the past experience (super cyclone of 1999) that had once showed the highest level of unpreparedness of the Indian state towards disaster management<sup>82</sup>.

Presently many state governments in India are moving towards a working system of disaster management by mainstreaming disaster preparedness and mitigation in various plans and policies. But disaster management policies and performances in India in various states shows variations in implementation and performance are yet to be substantial in nature<sup>83</sup>.

Recent disasters except Phailin 2013 has once again highly challenged the disaster risk mitigation in India. The government allocation and expenditure on disaster management has increased in all these years yet the amount (1% of the total budgetary allocation) is negligible compared to the amount required for relief and post disaster mitigation and reconstructions with additional calamity assistance coming as soft loans from multilateral financial institutions. There is surely a large gap to be fulfilled regarding existing arrangement of financing disaster management in India<sup>84</sup>.

The above scenario present interesting yet contrasting picture that highlights the fact that practical implementation of disaster management plan has its own constraints and gaps needs to be filled for better management of disasters. Gujarat was the first state in India to frame a Gujarat State Disaster Management Plan in 2003 in the light of its past experiences with disaster. At present Uttarakhand is not the only state in India to find its capabilities challenged and being unprepared for countering such events of grave magnitude. Most of the states are still unprepared

to manage such high scale devastations. The recurring occurrences of disaster in India covering most of the states require better preparation based on ground realities. After falling so many tests in the past, Odisha responded to cyclone Phailin well prepared. But many states in India are still not prepared fully to take on their responsibilities. India lags behind in building resilience as there is no long-term strategy for mitigation and development of hazard prone areas for disaster reduction given the current development scenario.

The recent cases of disasters in India have once again brought to the forefront risks and vulnerabilities associated with disasters. As such disaster mitigation and preparedness has a long way to go in case of India. The structural and non- structural measures must be integrated for a more holistic approach to get better results as India needs to move from relief and response towards disaster management. Alternative perspectives of disaster management must be incorporated to complement the dominant approach on disasters and its management.

To find best possible solution to disaster management in India multi-stakeholder participation involving local government and local people in the process of decision making is one way forward thereby ensuring the role of civil society in informed decision making process. Another process entails bringing in the issue of governance to the forefront for clear distribution of tasks, transparency, direct communication accountability and enforcement of responsibility to those associated with the task of disaster management.

### ***Current Status of Disaster Management at the Sub-Regional and Regional Level: Bangladesh and India in the context of South Asia***

The highly challenging nature of disaster management in the context of the Indian sub-continent demands a more comprehensive approach to be integrated at the sub-regional and regional level to deal with the devastating impacts of disaster which is a recurrent feature in all the countries of

South Asia including Bangladesh and India. This also brings to examine the status of disaster management in the South Asian region taking into account the particular case of Bangladesh and India as most of the neighbours share common natural resource- water.

Disasters are often transnational in terms of geography of scale and devastation demanding relief measures and resources on a scale that cannot possibly be managed by a single country alone. Disaster management may provide an opportunity to address bilateral and regional political issues that have hitherto proven difficult to achieve. Such a policy is absolutely essential given the South Asian regions proneness to natural disasters of all categories. Disasters provide the opportunities for the neighbours to come closer to share a common crisis to get over some long standing grievances and disputes. Cooperation on disaster risk management in India and Bangladesh has to be explored on two levels: first bilateral relations between both the countries that will shape the future direction on cooperation on disaster issues and second role of regional cooperation in disaster management.

Contextually examining the bilateral relations between India and Bangladesh could be characterized by “short honeymoon periods of raised expectations followed by longer periods of disgruntled expectations resulting in areas of conflict and attempts at cooperation” between the states<sup>85</sup>. Over the years according problem of national identity, and national priorities, mistrust and differences regarding issues of insurgency in the north- east, resource sharing and migration has affected relations between India and Bangladesh<sup>86</sup>.

Explaining this relationship in the context of security analysis brings in the perspective of ‘small-country syndrome’ for Bangladesh which is reflected in its relation with India in a world system of states marked by an unequal and hierarchical distribution of power where small states are essentially geared for survival due to fear complex of a hegemon and in this context it is

India<sup>87</sup>. This kind of perpetual default must be overcome by both India and Bangladesh to forge better ties in future<sup>88</sup>. With the coming of Awami League to power under the leadership of Sheikh Hasina in December 2008, enhancement of bilateral activities has given the impression that the two countries are moving ahead to optimize bilateral relations<sup>89</sup>.

India's disaster policy towards its neighbours in South Asia as S.D. Subba Chandran explains is one of "disaster relief based" on two perceptions: first on humanitarian ground and second as part of its diplomatic outreach to the neighbouring countries in times of crisis. The apolitical nature of disaster management lends credence to the benign and engaging agenda of India's foreign policy. India's attempt has been to achieve an image makeover in the region from one of power viewed with suspicion and resentment to one that can be viewed as trustworthy and sincere in its intentions<sup>90</sup>. The response and extent of India's relief operations in case of Tsunami 2004, Bangladesh 2007, Myanmar 2008 and more recently the Nepal earthquake disaster 2015 reinforces India's geopolitical location and maritime reach that places India in an effective and better position compared to others to engage in disaster management operations in South and South East Asia.

In this context it is pertinent to mention that both India and Bangladesh need to cultivate common areas of concerns for mutual functioning and workable solutions to address long standing problems of water sharing and addressing natural hazards of flood and cyclones. Disasters exacerbated by climate change is the next emerging environmental challenge in the sub- continent particularly for Bangladesh being a low lying country worst affected by sea-level rise in near future<sup>91</sup>. Climate change is also going to hamper India's, prospects of development and affecting the poor and the marginalized<sup>92</sup>. The vulnerability from climate change is more in

case of Bangladesh as the vast coastline of the country is exposed to varying degrees of natural disasters and low level of resilient capacity.

The focus of the study particularly rests on India and Bangladesh but since other countries are part of the common river basin (GBM) system a reference will be made particularly to Nepal to understand the complete scenario. Bangladesh and India are closely connected through the common (GBM) river systems. This also requires management of water resources at the collaborative plain among nations of South Asia. In this context it is pertinent to mention that among all bilateral disputes between India and Bangladesh the most critical has been the sharing of common water resources and its management to control flood disasters in the region.

The Ganges water dispute between India and Bangladesh goes back to the partition in 1947 when most of the Indian sub-continent was ruled as a single British entity. Water related issues arose in the 1950's and the 1960's when the Hoogly River experienced silting problem and navigation for trade route was becoming difficult. The Indian Government decision to build a massive dam at the point where Ganges becomes a boundary river between India and Bangladesh worsened the problem. This dam would divert the waters of the Ganges to the river Hoogly, which in turn would flush the port of Calcutta from siltation. With Bangladesh becoming an independent nation in 1971, the Farakka Project became a matter of dispute between the two countries<sup>93</sup>.

The Indo-Bangladesh Treaty of Cooperation and Friendship signed in 1972 between Indian and Bangladeshi was a new direction in bilateral cooperation that pledged the nations to consult with each other during the times of security threats and settlement of bilateral disputes with the sovereign consent of both the countries. The Treaty of Friendship and Cooperation also included treaty Article 6 on flood control, river basin development, development of hydroelectric power generation and irrigation<sup>94</sup>.



The resultant gain was the establishment of Indo-Bangladesh Joint River Commission on 24<sup>th</sup> November, 1972 to resolve water related issues particularly the Farakka Project and flood control measures between both the countries. A Joint Declaration was issued by both the countries stating that experts of both the countries were directed to formulate detailed proposals on advance flood warning, flood forecasting, study of flood control and irrigation projects on the major river systems and examine the feasibility of linking the power grids of Bangladesh with the adjoining areas of India so that water resources of the region could be utilized on an equitable basis for the mutual benefits for the people of both the countries<sup>95</sup>.

After long years of negotiations one of the major achievements under the Joint Rivers Commission was the conclusion of thirty years Ganges Water Treaty on 12 December, 1996 on sharing the Ganges water at the Farakka Barrage. The Treaty is to serve not only as a legal statute of technical character but is also a framework treaty for future rational principles for regulating the equitable water distribution between Bangladesh and India. This can also work as the basic principles for conclusion of future agreements on other common rivers so as to adopt an integrated approach for sustainable management of all shared rivers<sup>96</sup>.

This has also opened the avenue to discuss the next major water sharing dispute between India and Bangladesh on Teesta river. In this context its worth mentioning that Bangladesh and India share fifty – four border rivers and sharing of river water resources has always been critical for both the countries. Teesta is the most important river and Bangladesh insists on sharing water agreement with India<sup>97</sup>. Till date no definite agreement has yet been reached on sharing of the Teesta waters as it hampers the interest of West Bengal, one of the important states of India that gets affected by the water sharing agreement<sup>98</sup>.

Under the present system, the existing mechanisms support the transmission of flood forecasting data on major rivers such as the Ganga, Teesta and Brahmaputra during the monsoon season between both the countries. Particularly the Indo-Bangladesh Task Force of Flood Management tries to identify the gaps and technical faults in the embankments of the common rivers between both the countries and coordinate in technical expertise for repairment to avoid flood disasters. This sharing of information of flood forecasting has helped Bangladesh to shift its people to safer shelters<sup>99</sup>.

To strengthen bilateral cooperation on flood management India is also providing the flood data of Farakka for Ganga and the flood data of Pandu, Goal Para and Dhubri for Brahmaputra and of Silchar for Barak during monsoon period to Bangladesh for use of their flood forecasting and warning arrangements. It is also providing flood forecasting data for Teesta, Manu, Gumti, Jaladhaka and Torsa and other rivers. The transmission of flood forecasting information has helped the civil and military authorities in Bangladesh to shift people to safer places. The cooperation between Bangladesh and India has become substantial through the working of the Joint River Commission that is functioning as a vital mechanism not only building confidence and cooperation regarding sharing of common rivers but also playing an important role in flood control management<sup>100</sup>.

Flood management in the GBM basin also requires take into account the integrated development of the Mahakali River Treaty that was signed between Government of India and Government of Nepal in 1996 primarily to generate huge amounts of hydroelectricity trap monsoon water for irrigation purposes during the dry season but also to manage flood control. The Treaty Document concerning the integrated development of the Mahakali River lays down the basic provisions for the establishment of a Mahakali River Commission that shall be guided by the Article 3, Article

5 and Article 9 of the Treaty based on the principles of equality, mutual benefit and “no harm” to either party<sup>101</sup>.

The Pancheshwar Multipurpose project is the centerpiece of the Treaty of 1996 and an Indo-Nepal Joint Group of Experts (JGE) is overseeing the finalization of the Project under the Joint Project Office that was set up for this purpose in December, 1999. Similar cooperative assessment is being carried out for the Saptakosi Project Area to prepare a detailed joint project. An Indo-Nepal Joint Committee on Water Resources (IN-JCWR) has been set up as per the agreement in 2000 to deal with the existing agreements and understandings regarding water resource management of both the countries. The Committee is headed by the Water Resource Secretaries of both the countries which functioning as the main organization for all other committee related to water issues between both the countries<sup>102</sup>.

It is significant to take note of the fact that flood control mechanisms are jointly organized and cooperated between India and Nepal to lessen the distress of the people of GBM river basin. To serve this purpose India and Nepal has also set up a Joint Committee on Flood Forecasting (CFF) on rivers common to both the countries to prepare a flood forecasting master plan in 2002. During the same period a High Level Technical Committee on inundation problem was constituted in 2002 to oversee and investigate the causes and effects of flooding<sup>103</sup>. The 6th meeting of the Indo-Nepal joint committee on water resources (JCWR) held on 24-25 November, 2011 at New Delhi agreed for initiating the process of establishment of Pancheshwar Development Authority (PDA) for implementation of Pancheshwar Multipurpose Project<sup>103</sup>.

India, Bangladesh and to some extent Nepal could jointly cooperation for the purpose of disaster risk reduction in the GBM river basin for the protection of the livelihood and ecosystem of the region. Cooperation should address for a comprehensive people centered plan for the optimum

development of Himalayan water resources keeping aside their differences for the betterment of the region. Multilateral cooperation on river basin management is the ideal solution to water security issues and management of common disasters. Sub-regional exercises between suitable countries can bring about comprehensive collaboration and set the tone for mutual beneficial arrangement. But due to low level of regional integration, holistic management of water resources for the mutual benefit at times gets hampered<sup>104</sup>.

It is pertinent to mention that natural disaster as a human security challenge and mitigation of disaster risks also demands for regional cooperation. The level of inter-dependency among South Asian countries is growing due to the transnational and interconnected nature of human security concerns in the region. The profound implications of the issues concerning human security such as environmental degradation, migration, natural disasters, climate change and others calls for a greater regional cooperation<sup>105</sup>.

Regional cooperation world-wide has not only succeeded but it is also an irreversible process. The noted South Asian expert S.D.Muni contemplates that all regions play an important role in world politics although the parameters may be different for understanding global conditions<sup>106</sup>. The process of regional cooperation was not an unknown idea in the past. According to the noted expert Andrew Hurrell while explaining the resurgence of regionalism in world politics agrees that it has assumed more vigour as regular pattern of international behavior in the last five decades and more so in the post cold war scenario<sup>107</sup>.

Regionalism in the era of globalization reflects proliferation of regional associations usually much more than mere territorial grouping of states. Regional organizations usually differ in their aims, objectives and modes of functioning, created out of innate perceived needs for achieving

certain national goals whether socio- economic or otherwise through the method of cooperation. The process of regional cooperation provides for the essential foundation for a much wider matrix of globalization guided by common needs for international cooperation and cross border facilitation and management of common concerns<sup>108</sup>.

On the basis of above theoretical explanation it could be said that regional cooperation in South Asia has been a non-starter from the very beginning as advocated by its critics where as staunch supporters have highlighted regional and economic projects that provide the necessary momentum to cooperation. In more recent years cautious optimism has given way to skepticism and pessimism that incremental approach has failed to raise the level and scope of regional cooperation beyond a limited point<sup>109</sup>.

The South Asian Association for Regional Organization (SAARC) was established by the Dacca Declaration of 1985 to promote regional cooperation among the countries of the region which included Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka as well as Afghanistan joining in 2005. From the very beginning SAARC was dogged with various problems involving enormous challenges and demands on the member states, the promises yet to be materialized with eighteen summits in the last twenty-years. According to foreign policy expert Sheel Kant Sharma the revitalization of SAARC demands transforming the pattern to device due mechanism for monitoring progress, identifying obstacles and review the functioning for proper implementation of action taken for cooperation<sup>110</sup>.

In a similar vein Eric Gonsalves points out that it is essential for South Asia to reverse these negative attitudes and mindsets and pursue vigorously for regional cooperation leaving aside political obstacles on two fronts. First economic cooperation must be heightened to so that South-Asia is not left behind in the process of globalization. With Indian economy moving

forward to join the developed world it would be an opportunity for the neighbours to join the bandwagon<sup>111</sup>.

Second natural disasters in recent years have indicated that cooperation in relief and rehabilitation operations is an excellent way to improve relations and disarm suspicions and hostility. During the Tsunami of 2004 India's efforts to aid Srilanka has gone a long way in this direction. Even after the 2005 Kashmir earthquake, joint action by the governments of India and Pakistan brought results to a limited extent. The positive attitude and goodwill generated by these joint actions are worth many confidence building mechanisms in the Indian sub continent and would help in strengthening disaster risk mechanism in the sub-continent<sup>112</sup>.

In this context it is pertinent to mention that several initiations have been undertaken in recent years to institutionalize and adopt mechanisms at the regional level to mitigate disaster risk. The South Asian Association for Regional Cooperation (SAARC) has proved to be the fundamental institutional mechanism to undertake the initiative in the South Asian region. The members of SAARC have reiterated at various Summit meetings to strengthen and intensify regional cooperation to preserve, protect and manage the diverse and fragile eco-system of the region including the need to address natural disasters and challenges recently growing out of climate change. The preservation and protection of the environment including disaster risk reduction and management remains a high priority on the agenda of cooperation among the members of SAARC<sup>113</sup>.

The Third SAARC Summit in 1987, Kathmandu, Nepal was the first institutional response that addressed the issue of natural disaster and environmental security of the region. A Study was commissioned in 1991 for the Protection and Preservation of the Environment and Causes and

Consequences of Natural Disaster and prepared a comprehensive framework to guide future actions in this regard.

In addition two landmark Special Sessions were conducted in the aftermath of Indian Ocean Tsunami (Male, July 2005) and SAARC Ministerial Meeting on Climate Change (Dhaka, July 2008), to further strengthen the existing mechanisms to address emergent issues of disaster and climate change<sup>114</sup>. Moreover the Sixteenth Summit 2010 at Thimpu, Bhutan adopted the “Thimpu Statement on Climate Change” for member countries to take up initiatives at the regional and national level to address the issue in a focused manner.

Currently member states have agreed on Rapid Response Mechanism on Natural Disaster at the Maldives Summit 2011 called the SAARC Agreement on “Rapid Response to Natural Disasters”. The operationalization of Natural Disaster Rapid Response Mechanism as provided under the Agreement would institutionalize regional cooperation among member states in areas of critical response after a post disaster scenario in the region<sup>115</sup>.

Given the regions vulnerability to various kinds of disasters the member states attended the first-ever South Asian Annual Disaster Management Exercise (SAADMEx) held in April 2015, New Delhi to strengthen disaster risk mitigation framework in the region. India has been taking a "lead" role in this domain by providing relief in the aftermath Nepal earthquake in April 2015<sup>116</sup>. These positive actions could enhance regional disaster relief cooperation as a viable area for collaboration and could help bridge differences between member countries that share geographical vulnerabilities like disaster that calls for joint management exercises to reduce disaster risks<sup>117</sup>. The underlying vulnerabilities and risks must be removed and governance scenario strengthened for capacity building and resilience of the communities affected by

disasters. The questionnaire survey conducted to bring out the opinion of the respondents for this purpose reveals that 68% of the respondents opinionated that the role of state in Bangladesh and India towards disaster management seems inadequate. On the issue of whether both India and Bangladesh require better governance in disaster risk reduction an overwhelming 78% of the respondents agreed that better governance is required to manage disaster issues.

The State in developing countries like India and Bangladesh has the institutional apparatus and capacity though constrained at times to deal with the management of disasters. The respondents 65% of them firmly believed that disaster management is an issue of governance better managed in collaboration with all the sections of society including all the stakeholders to reduce disaster risks and vulnerabilities of the people affected by disaster. Even the Post 2015 Framework has recommended the strengthening of good governance in disaster risk reduction and to Build Back Better (BBB) i.e. post recovery and reconstruction programme to secure the lives of the individuals from “threats” to disaster so that “no one is left behind” targeting most vulnerable people and those living on the margins of the society.

Drawing on the basis of above discussion it could be **concluded** that the existing mechanisms for disaster management is being extensively carried on at the national level with shortcomings and limitations that requires strengthening of the overall national disaster framework. At the same time the national level mechanisms could be strengthened by bilateral and regional arrangements that could supplement the disaster management framework of the respective countries. In case of Bangladesh the above arrangement is more beneficial because it helps a developing country like Bangladesh to overcome constraints, challenges and limitation in the field of disaster management more so with the threat of climate change looming large over the Indian sub-continent.<sup>118</sup>



Under the present circumstances Bangladesh and India must reduce the potential threats arising out of natural disaster issues impacting sustainable development and security of the population. Both the states need to concentrate upon stabilizing and implementing various programmes of action particularly relating to disaster and growing concern for climate change. Moreover in their further interactions with each other, stress should be laid upon collaborative and cooperative action to reduce disaster risks and vulnerabilities commonly faced by both the countries. The effort and exercise to strike a balance between economic development environmental security and disaster from the perspective of human security requires addressing disaster preparedness and mitigation on an emergent plain.

The incidence and severity of disaster has increased over time, as such disaster management deserves highest priority. At the same time policy adaptation and implementation must take into consideration a detailed cost–benefit analysis so that actions could to be prioritized among different mitigation programmes undertaken by the states taking into consideration the threat of natural disaster and climate change. Proper and timely policy response could be used as an effective tool to reduce human insecurities in the larger interest of the community. This is applicable to both Bangladesh and India that has to manage various threats and challenges impacting the development scenario, wellbeing and security of the people.

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## *CHAPTER VIII*

### *CONCLUSION*

The agenda of addressing disaster, sustainable development and human security is a major subject area that requires deliberation at multiple levels of analysis within the ambit of international relations. At the same time management of disasters requires policy formulations, decision making and development of legal framework or legal regime at multiple levels of governance including international, regional and national levels. Disasters often turn out to be trans-boundary in nature deliberating on cooperation and conflict among states and society playing in the international humanitarian arena. Consequently various exercises have been formulated at the international level to prioritize and recognize the issue of disaster as a major threat to human security.

This has also laid down the framework to recognize disasters as a major threat to security and sustainable development of the individual and the society concerned as well as to adopt policies, mechanisms and strategies for disaster management and risk reduction at regional and national level. At this juncture it seems apt to refer to some theoretical propositions of international relations to substantiate and develop the theoretical foundation of disaster-security and development inter-linkage that would probably help to identify the significant data and facts to address disaster as a major area of human security concern.

Drawing on the basis of conclusion arrived in the present study that disaster –development and security linkage needs to be addressed at various levels of analysis the task is to identify the best suitable theoretical explanation to address the current issue. Despite the presence of a vast policy

framework and legal-institutional mechanisms in both Bangladesh and India various gaps and lacunae have been observed in the implementation of the disaster management framework in both the countries. Vulnerability is a major component of disaster management that needs to be better addressed from the point of sustainable development goals and human security perspective to “build back better” the capacity and resilience of individuals and communities to disasters.

In this context it is pertinent to mention that the international exercise for formulation of disaster risk reduction regime itself recognizes the co-operational and collaborative linkage across the vast spectrum of international, regional and national level of governance of rule making and policy initiative. This is also based on the assumption that nation states as actors in international relations would incorporate for the formation of legal regime of disaster management for addressing the challenges through policy formulations and mechanisms in their respective areas of territorial jurisdiction as well as going for a cooperative model of regime formation for disaster management sharing common geophysical and socio- economic vulnerabilities to disaster, based on the policy of consensus and cooperation.

Addressing disaster as a non traditional security concern and as a “threat” to security itself challenges the traditional notion of security explained in terms of military security with military-defense logic operationlized in the context of state security or national security (Morgenthau 1976, Waltz 1979, Cox 1981)<sup>1</sup>. Security is collaterally related to national security within a world which is inherently contentious and anarchical. Yet it is assumed that actors in international relations would follow the regulations for managing the complex interdependence of relations among themselves to build the legal and policy premise of dealing with non traditional security concerns such as disaster<sup>2</sup>. This also addresses the fact that in the absence of any global

enforcement agency to legitimize the policy regulations, the existence of nation states provides the rationale to develop the disaster management regime in their respective countries.

Both India and Bangladesh are signatories to the international legal framework for disaster risk reduction, known as the Hyogo Framework for Action (2005-2015)<sup>3</sup> that advocates mainstreaming of disaster risk management in development plans and policies. This is further strengthened by the currently ongoing exercise of post recovery and reconstruction programme for implementation by 2030 under the Global Framework of Action to address disaster issues<sup>4</sup>. This once again requires a broad 'people centered' approach to disaster risk particularly focusing on underlying disaster risks and vulnerabilities such as poverty and inequality, climate change, unplanned rapid urbanization, poor land management, weak institutional arrangements, lack of regulations, impact of demographic change and declining ecosystems.

The interpretations to address disaster regime would also entail state-civil society interaction at the structural and functional level to securitize the lives of the people impacted by disasters. The civil society narrative would be addressed to create the space to mobilize and channelize peoples demand for risk reduction and proper management of disasters. The inter-relationship between civil society and the state has always been one of interdependence with state providing the legal and regulatory framework for a democratic civil society to function and a civil society exerting the pressure for accountability that keeps the state and its governance on tracks.

The initiative to reduce disaster vulnerabilities which is multi-dimensional (socio-economic and political) in nature derives from the age-old phenomenon of human vulnerability to disasters both natural and anthropogenic. The long history of disasters, their increased intensity and frequency and impact on development scenario has brought the question of disaster management

to the forefront. With the passage of time disaster management has evolved into a methodical and scientific technique to address disaster<sup>5</sup>. The disaster management measures and strategies now focus both on policy initiatives and on systematic observation, analysis and dissemination of information in order to make optimal utilization of resources to reduce the severity of the impact of disasters particularly in the developing countries.

The international exercise on recognition of natural disaster as a threat to human wellbeing began with the adoption of the International Decade for Natural Disaster Reduction (IDNDR) by the United Nation General Assembly Resolution 44/236 in December 1989 influencing global building guidelines and standards for management of disasters<sup>6</sup>. Subsequently United Nation's first World Conference on Disaster Risk Reduction (WCDRR) commonly known as Yokohama Strategy and "Plan of Action for a Safer World" 1994 was the next step to recognize disaster management as part of sustainable development agenda and a concern for human security<sup>7</sup>.

The Hyogo Framework for Action (2005-2015) built upon the past experiences on disasters like the Indian Ocean Tsunami 2004 brought about changes in the overall disaster management strategy which was to link natural disaster, sustainable development and human security. This effectively has shifted the focus of disaster management from "relief centric" to "pre-disaster preparedness" and from moving towards "culture of relief management" to "culture of disaster preparedness".

Also in terms of Millennium Development Goals (MDGs) (2000) addressing disaster issues normally comes as the member country's commitment procedure to fulfill the agenda of sustainable human development. The Post-2015 development agenda targets Sustainable Development Goals (SDG's): the 2030 agenda that sets forth seventeen aspirational goals so that

“no one is left behind”. This means targeting most vulnerable people and those living on the margins of the society. Disaster as such poses a major threat to these vulnerable people whose lives must be secured in the context of vulnerabilities be it social, economic, political or natural.

The strategies and mechanisms adopted in the last two decades refer to several significant actions and policy initiatives undertaken in the field of disaster management at the global, regional and national levels has led to the development of global disaster regime. The issue of disaster management is examined within the framework of regime theory to understand the rationale behind the global exercise to address disaster as a threat to human wellbeing. The United Nations as the global international institution has been the focal point in development of disaster regime at the international level.

Regimes are widespread and important phenomena in international relations where the actors adopt policies that act as key to realize the benefits of cooperation in common areas of concern. Since the late 1970s international regimes have been a core concern of international relations theory. The common perception about regimes as J.S. Goldstein (2005) points out combines both elements of realism and liberalism. In international relations theory nation states are considered the most important actors and states are regarded as autonomous units maximizing their own interests in an anarchic system. Regimes come into existence to overcome collective goods dilemma by coordinating the behavior of states on specific areas of concern. Although states continue to seek their interest, they create framework to coordinate with other actors if required to realize the goal of self interest<sup>8</sup>.

As the neo-liberalist would prefer that a regime helps make cooperation possible even within an international system based on anarchy. Regimes open up new possibilities and empower national

governments faced with issues where collective goods problems would otherwise prevent governments from achieving their ends. At the same time neo-liberal institutionalism concedes to several basic assumptions of realism, among them the most important being that states are unitary actors rationally pursuing their self interest in an anarchic world. Despite many sources of conflict states do cooperate most of the times and neorealist pessimism about international cooperation is not valid<sup>9</sup>.

States do create mutual rules and regulations and institutions to promote behavior that enhance the possibilities of mutual gains. In this context it may be stated that building up a disaster regime to realize the collective good to secure the lives and livelihood of the people at the international level becomes possible within the context of regime theory where actors cooperate at the international level of global governance to achieve desired goals within the structural system of international relations.

The conceptualization of international regimes is based on the Stephen Krasner's classic definition of 'regimes' as "sets of implicit or explicit principles, norms, rules and decision making procedures around which actors expectations converge in a given area of international relations"<sup>10</sup>. Keohane and Nye have further sharpened Krasner's definition by adding a behavioral component to the four-normative – institutional arrangements proposed by Krasner. According to Keohane and Nye regimes are sets of governing arrangements that include networks of rules, norms and procedures that regularize behavior and control its effects among actors<sup>11</sup>. In a similar vein Oran. R. Young describes regime as a concept that is often used too loosely in the context of mutual relations between states<sup>12</sup> whereas Charles Lipson suggests that regime favours convergence of interests meaning that participants in the international system

have similar ideas about the rules governing their mutual participation and each expect to play by the same rule<sup>13</sup>.

While emphasizing the behavioral component of a regime Martin List and Volker Rittberger try to clarify the difference between a treaty and a regime. Whereas a treaty is a legal instrument stipulating rights and obligations a regime is a social institution wherein stable patterns of behavior result from compliance with certain norms and rules, whether these are laid down in a legally binding instruments or not<sup>14</sup>. It is to be noted that regimes are created for specific issue areas which are in turn part of the larger, theoretically determined policy area. This implies a convergence of interests that means the participants in the international system have similar ideas of cooperation and rules that govern their mutual participation as each is expected to play their role according to the same rules and norms to overcome the collective goods dilemmas by coordinating the behavior of individual states<sup>15</sup>.

The regime theory offers three plausible explanations behind the rationale of nation state actors to cooperate to adjust their behavior to the actual or anticipated behaviour of others. Firstly the regime theory offers an analytical framework to understand the conditions under which the states faced with common problems choose out of self interest to establish institutions to manage in a cooperative manner. Secondly, it offers a methodology to identify the existence of norms and rules at the international level and their impact on the political process and thirdly, it allows an evaluation of institutional effectiveness in overcoming problems for which they were mandated to deal with by highlighting the weaknesses and gaps to strengthen future cooperation<sup>16</sup>.

Contextually looking at the development of disaster regime, since the 1990s at the international level efforts led to the emergence of mechanisms, norms and policies to ensure the security of



the individual and the community against disaster vulnerabilities with creating the conditions under which international actors are persuaded to comply with such norms. In order to promote these standards, international organizations and institutions direct these internationally agreed norms upon the social system of states by engaging the actors and non-state actors to fulfill their obligations upon agreed principles.

The international community as such has recognized that systematic and specific action for disaster risk reduction requires concrete actions and mechanisms at multiple levels of governance. This international exercise started with the adoption of International Decade for Natural Disaster Reduction (IDNDR) (1989-1999) which was the first major international institutional mechanism to address the issue of natural disaster. Under the United Nations institutional arrangement the First World Conference on disaster management was called upon in Yokohama, Japan in May, 1994. This conference prepared the Yokohama Strategy and Plan of Action for Safer World.

The Second World Conference on Disaster Risk Reduction was held in Kobe, Japan in 2005 when one hundred sixty eight nations participated and adopted the “Hyogo Framework for Action (2005 – 2015): Building Resilience of Nations and Communities to Disasters” (HFA). The HFA (2005) laid down plan outlay for ten years that reflected the intension of the international community to take a more comprehensive and holistic approach to disaster risk reduction. In the aftermath of Indian Ocean Tsunami, December 2004 and following the HFA 2005 the foundation was laid for developing a comprehensive framework on disaster management in the South Asian region. This led to an attempt to mainstream disaster management at regional and national level policy making. Several initiatives have been

undertaken in recent years to institutionalize and adopt mechanisms at the regional level to mitigate disaster risk.

The South Asian Association for Regional Cooperation (SAARC) is the fundamental institutional mechanism to undertake the initiative in the South Asian region. The SAARC Comprehensive Disaster Framework (2006)<sup>17</sup> provides a platform for South Asian Countries to mainstream disaster risk reduction in their national policies so as to build resilience of the society towards disaster which has emerged as a major threat to sustainable development and human security in the region.

To address the Post 2015 Framework for Action and build the strategy in managing global disaster risks the international community met in March, 2015 in the Tsunami impacted city of Sendai to mainstream and strengthen disaster risk reduction (DRR) in national policies. The Third World Conference on Disaster Risk Reduction (WCDRR3) was to comprehend the ten years of preparation in disaster risk management and capacity building following the HFA to develop a global framework for action. The Sendai Framework (2015-2030) has been adopted for a period of fifteen years.

Against the above backdrop it is natural to address the linkage between disaster and development. Disaster is closely linked to the process of development. Disasters triggered by natural hazards put development gains at risk. Disaster risks are generated and accumulated due to unsustainable pattern of development being pursued through inappropriate development interventions often manifested in rapid degradation of the natural environment and enhanced vulnerability of the people. Anthony Oliver-Smith argues “disasters occur at the interface of society, technology and environment that are fundamentally the outcomes of intersection of these

features”<sup>18</sup>. Human vulnerabilities to disasters have increased due to the unsustainable development strategies being pursued since the post war era. This has put a large section of the population residing in the countries of the global south to increased vulnerability scenario.

This is also indicative of the fact that disasters never constituted a significant part of the overall development strategy. The concept of development has historically been embedded in development economics. The post war era has witnessed the development strategy unfolding as Bjorn Hettne analyses historically in a dialectical fashion oscillating between “mainstreams” and “counterpoint paradigms”<sup>19</sup>. This differentiation of approach to development can simply be distinguished into modernization and dependency approach to development. The choice of development strategy for most of the world has been structured on this dependent relationship.

At present the broad agenda of neo-liberal capitalist development model of development is being pursued globally with variations on the national scale. In the light of capitalist (neo-liberal) model of development Michael P. Todaro states that the very meaning of the term “development” had faltered from its most exclusive association with the rate of aggregate economic growth to integrate a much broader interpretation that now incorporates measures of poverty, inequality, unemployment as well as aggregated human development <sup>20</sup>.

Similarly Wolfgang Sachs points out that in the present circumstances the development discourse is made up of key concepts and as such it is impossible to talk about development without referring to concepts such as poverty, production and the notion of inequality<sup>21</sup>. In a similar vein World Development Report 2010 clearly states that “poverty reduction and sustainable development remains core global priorities”<sup>22</sup>. At the same time analyzing the nature of unsustainable development pattern Peter Hossay points out that this has resulted in the

destruction of the global ecosystem and violent inequity in the distribution of wealth and resources that are two sides of the same coin one cannot be addressed without addressing the other<sup>23</sup>.

Against the above backdrop it is logical to understand that the development strategy pursued so far has been shaped by the increasing tension between economic development and environmental health of the biosphere that has ultimately ushered the sustainable development agenda on a global scale. The sustainable development agenda as Pamela Chasek points out is being pursued at the global institutional level by the United Nations Environment Programme of the UNDP<sup>24</sup>.

Sustainable Development is now considered as the dominant discourse on the environment – development problematic. It puts forth as John. Dryzek points out the promise to mitigate the long standing tension between protection of the environment and economic development<sup>25</sup>. The development of sustainable development discourse could be traced back to the radical environmentalism of 1970's. This radical position on environment and development was advocated by the radical environmental theorists. Meadows (et.al.) were the first to present “The Club of Rome's Report” (1972) that placed the predicament of development–environment nexus on the global platform<sup>26</sup>.

The radical perspective argues that environment degradation arises due to the capitalist mode of production resulting into environmental degradation and unsustainable pattern of growth. These associated concerns and issued are directly related to liberal (neo-liberal) capitalist–global model of development. Particularly perspectives from the south by various scholars led to an intellectual “post-development” movement built directly on the critical re-evaluation of the capitalist development strategy pursued at present<sup>27</sup>. The radical development-environment critic

represented by neo-marxist scholars like Samir Amin, Gustavo Esteva and Vandana Shiva from eco-feminist perspective highlighted the development-environment dilemma from the perspective of developing South<sup>28</sup>.

The Brundtland Commission Report 1987 as a global exercise laid down the parameters of sustainable development resulting in a paradigm shift that viewed development strategies to recognize the limits of ecosystems ability to regenerate without compromising on future aspirations and needs. The Report also recognized that disasters are a major threat to human well being and advocated incorporating the issue of disasters to build the agenda of sustainable development. The Commission also strongly mentioned the gravity of natural disaster and its inter connectedness to the issue of poverty, and how disasters affect the poor's of the world particularly in the developing countries where incidence of death and loss to economy is the highest due to over population<sup>29</sup>.

The Earth Summit at Rio in 1992 adopted Agenda 21 that refers to a global Plan of Action for achieving Sustainable Development in the twenty first century also recognized natural disaster as one of the important threats to human well being that led to the beginning of international exercises on disaster mitigation and response. The highly significant Chapter Seven Section F of Agenda 21 recognizes natural disasters as one of the important threats to human security and advocated disaster risk reduction to be built in the agenda of development<sup>30</sup>.

Development to become sustainable requires modification in the current strategies with a keen focus on threats that try to topple the progress that has been achieved so far. These circumstances called for natural disaster to be linked quite naturally with the issue of security considered in

terms of non-traditional security. Such “existential threats” to security concerns posed by natural disasters makes it mandatory to address it within the context of human security<sup>31</sup>.

Disaster is the prime threat to overall human security. The theoretical exposition of human security perspective is considered to explore the issue of natural disaster and studies the linkage between natural disaster and disaster–vulnerability interface. The interpretation and understanding of natural disasters has significantly changed from 1950s onwards. Disasters have traditionally been considered as “natural” with perception changing to disaster causing agents acts of man that turns natural hazards into disasters<sup>32</sup>.

This has resulted in a paradigm shift in interpretation of natural calamities, vulnerabilities and risks (socio-economic and political) that triggers natural calamities as well as environmental hazards as identified by Susan Cutter<sup>33</sup> to transform into major disasters. The interpretation on disasters as a result has bifurcated into two major strands of thought. The dominant (behavioural) paradigm based on human ecological approach first advocated by the eminent geographer Gilbert White and others in the 1970s<sup>34</sup> and the radical (structuralist) paradigm that highlighted human vulnerability especially in the third world due to marginalization of the poor in a globalised economy advocated by McEntire and K. Smith and others<sup>35</sup>.

Explaining the inter-linkage between natural disaster and human security Hans Gunter Brauch points out that human security as “freedom from hazard impact” is achieved when people who are vulnerable to these manifold environmental hazards and disasters (such as floods, landslides and droughts) often intensified by other associated societal threats and challenges (such as poverty and food insecurity), vulnerabilities and risks (such as improper housing in highly vulnerable flood prone and coastal areas) are better warned of impending hazards, prepared and

protected against these impacts and are empowered to prepare themselves effectively to avoid and to cope with the “survival” dilemma that often occurs during conflicts, natural hazards and complex emergencies where both concides<sup>36</sup>.

The focus on human security at a time when the security of the person is increasingly under siege due to rising frequency and intensity of natural disasters all around the world and particularly in the South Asian some of them even bringing out political consequences warrants the understanding of natural disaster as a non-traditional security. A theoretical discourse on human security will be comprehensive only by taking into account the rise of non-traditional security concerns and “existential threats” challenging the traditional notion of security.

The concept of security or state security has undergone significant changes in recent times with authoritative scholarly works coming from, Ullman 1983<sup>37</sup>, Buzan 1983<sup>38</sup> and others. In the realist-traditional discourse security is conceptualized in terms of power to increase the capabilities of the state to deal with threats of security. This concept of security however did not go unchallenged where efforts were made to make the security of the state more inclusive.

One of the earliest scholars to draw attention to the multi-dimensional complexities of the concept of national security was Arnold Wolfers who described it as an “ambiguous symbol” while Hedley Bull warned against a narrow view of security that was influenced by excessive concern for national interest or Robert Jervis highlighting “security regimes” at systemic level of analysis<sup>39</sup>. Yet the fundamental assumption regarded the state as the primary actor in international relations without giving much space to internal/non-traditional security threats to the states.

With the failure of traditional security studies to predict the end of cold war scholars were ushering a new paradigm to understand the meaning of security in changed circumstances. This also led to the ushering of the broadening of the security agenda with emphasis on existential threats highlighted by the Copenhagen School of security studies. Buzan was the first to draw attention to the need for developing a more comprehensive view of national security involving the three levels of security analysis-the individual, the state and the international system<sup>40</sup>.

The widening and deepening of security studies with emphasis on non-military threats on social actions and identities was further enlarged by the social constructivists like Onuf, Wendt and Ruggie<sup>41</sup>. Peter Hough very clearly stated that global security after the end of cold war has witnessed the rise of non-traditional security concerns in relation to traditional security issues referring to threats of non-military in nature including disasters as threat to security<sup>42</sup>.

The development of human security frame work by the Human Development Report of 1994 of UNDP was a pioneering step that shifted the focus of security from “military security of the state” to the “security of the people”. The Human Development Report of 1994 defined human security as not a concern with weapons but a concern with human live and dignity which highlighted two major components: “freedom from fear” and “freedom from want” and seven categories of threats to human security: environment, food, health, economy, personal, community and political that called for securitizing “threats”<sup>43</sup>.

This provided a fillip to non traditional security concerns such as disaster to be considered significant enough to be addressed from human security perspective. Recognizing disaster also required people-centered, comprehensive, content specific and preventive oriented responses. Later the Commission on Human Security Report 2003 was ushered to develop the concept of



human security as an operational tool for policy formulation and implementation of specific programmes of action to address critical and pervasive threats to security of the individual and the community<sup>44</sup>.

The security scenario in developing countries present a complex interrelationship between national security and human security concerns. As such human security stands according to King and Murray at the intersection of two major strands of thought –economic development and military security to generate “a new concept of human security” that has prompted the development and security communities to intersect particularly in conflict situations and threats to human survival<sup>45</sup>.

The concern for non-traditional security issues in the context of South Asia was reflected in the scholarly works of Chari and Gupta (2003) Basrur and Joshep (2007), Raghavan (2007) Lama (2010), Arora (et.al) (2012) and Upreti and Upadhaya (2012)<sup>46</sup>. These works highlighted human security issues revolving around poverty, internal conflict situation, terrorism, migration, gender, environmental degradation, natural disasters, climate change and others. In this context it is pertinent to mention that the questionnaire survey attempted to generate the opinion on the query that is natural disaster and human security interrelated with possible open-ended options/answers. Analysis revealed that an overwhelming 96% of the respondents answered in affirmative out of the total number of respondents. Interestingly the affirmative group was quite positive in its response that natural disaster entails human security concern and must be addressed for the security of the individual and the community impacted by disasters.

The Human Development Report 1994 categorically stated that disasters in developing countries are an integral part of their poverty cycle. Poverty causes disasters and disasters exacerbate

poverty. Only sustainable human development which increases the security of human beings and of the planet could reduce the frequency and impact of natural disasters.

On the issue of the linkage between the perennial problem of natural disaster and poverty among the South Asian states it was observed during analysis of the questionnaire survey that 95% of the respondents agreed in case of Bangladesh and 70% of the respondents in case of India agreed that the country is highly impacted by disaster events and poverty. The incidence of poverty increase with each disaster event hence there is a close link between natural disaster and poverty in Bangladesh besides other problems of development in South Asia.

As rising disaster losses threatened the sustainability of the development agenda particularly in the developing countries this has resulted in influencing global building guidelines and standards not only at the international level but also response generated at the regional and national levels for disaster risk reduction. This effectively has shifted the focus of mechanisms to reduce disaster vulnerabilities particularly for developing countries. Disaster management to become meaningful must be supported by the legal and administrative apparatus of the state. The legal apparatus emerges from the state and are maintained by the state. The state makes laws and the law creates the institutional mechanisms that govern the administrative apparatus of the state. Both India and Bangladesh have taken recourse to various legal-judicial and administrative responses in relation to disaster management in their respective countries.

The disaster management framework in India and Bangladesh has undergone a process of significant transformation. The process of change is being witnessed in disaster management approach particularly resulting in a paradigm shift from the conventional response of relief and rehabilitation to a more holistic approach of comprehensive risk reduction. This has resulted in

the adoption national policy on disaster management and enactment of Disaster Management Act 2005 in case of India and national policy on disaster management and Disaster Management Act in 2012 in case of Bangladesh resulting in the creation of legal- institutional framework to guide disaster management framework in respective countries.

Disaster management has always been considered as a function of the state. Since the ancient days of political governance Kautilya's Arthashastra the famous treatise on statecraft, economic policy and military strategy- power of the state based on realist tradition considered the primacy of the state in relation to religion. Kautilya's Arthashastra has listed eight kinds of providential visitations which he terms as "vyasanas" (such as fire, flood, diseases, famines, rats, tigers, serpents and demons) For Kautilya there is no control over the daivam or natural vyasana but for manusa vyasana or man- made disasters though misfortune may be responsible for them, he equally blames human beings. According to Kautilya calamities fall either by misfortune or by wrong policies and it was the duty of the king to protect his subjects from these calamities suggesting that the state has a major role to play in responding to disasters<sup>47</sup>.

The state has always been an important factor in directing the development processes throughout recorded history. It has played a crucial role in defining the boundaries of national activities. Several attempts have been made to understand the nature of the state with little agreement on the issue. Broadly speaking there are two broad dominant interpretations—liberal and the Marxist that guides any understanding on the nature of the state. This brings into the issue of various theories of state that imparts the philosophical basis for these arguments.

The classical liberal theory of the state grew out of the emerging new economic relations in the seventeenth and eighteenth century that saw the rise of new classes, new modes of economic activity, the emergence of nation, state, centralization of political power and colonial expansion

of the notion of western state which stimulated the debate over the modern political theories of the state in a capitalist society. This historical development provided the impetus for the first systematic effort by the political philosophers to understand the nature of state in a capitalist society<sup>48</sup>.

Classicalists like Hobbes and Locke both maintain that there is a pre-social state of nature that requires rational, self-interested individuals to contemplate and subsequently consummate a social contract giving rise to an appropriate institution in the form of state. With Hobbes the classical deductive methodology tries to arrive at the position of an absolutist state since the 'state of nature' is a state of war<sup>49</sup>. The ultimate solution is a social contract by which individuals give up certain right of 'self government' as David Held points out and in return are assured of law and order and enjoyment of rights under a single authority or a sovereign<sup>50</sup>.

Locke deviated from Hobbes and argued that there is a difference in this state of nature where there are equal rights to life, liberty and possessions and it is thought the second contract between the individual and the community that it derives its power to make laws for the society<sup>51</sup>. Unlike Hobbes, Locke's work progresses to establish a common superior where reasonable human's realize their rights to life, liberty and estate against the injuries or arbitrary action by individuals and punishments coming from a common superior.

This common superior for Locke is the community or the civil society which later translates into a legislature and the activities of the legislature must be limited by the purpose of public good. The sole purpose of the legislative power of the state is to act as a guardian of the people. Thus Locke's common superior residing in the legislature is less absolute than Hobbes sovereign power of the state<sup>52</sup>. The theoretical framework of Hobbes and Locke provided the base for liberal-concept of state i.e. the state as the guarantor of order, safety, stability and progress in

civil society built to limit the boundaries of state power, the individuals must enjoy rights for the protection of their self interest. The utilitarian philosophers Jeremy Bentham, James Mill and John Stuart Mill are particularly associated with liberal-democratic theory of the state advanced the proposition of self government in relation to the state.

The notion of consent based on active electoral participation is a logical extension of the liberal democratic state especially within the context of a growing capitalist class in the 19<sup>th</sup> century British society. This was reflected in the works of Bentham and Mill who were in favour of a more direct participation of the people in the civil society and between the state in order to maximize utilities<sup>53</sup>. John Stuart Mill further advanced the Utilitarian philosophy of ‘maximum good of the greatest number of people’ and Mill’s famous work ‘On Representative Government’ further laid the foundation of people’s franchise and their participation in the political process to elect their representatives to govern the state. This liberal democratic tradition is the foundation of the modern state legislative democracies<sup>54</sup>.

On the other hand the sociological conception of the state especially grounded in the works of Comte, Durkheim, Max Weber and others, place the state as a social institution more organically integrated into a larger social system performing certain functions to ensure social harmony and peace in the society. Comte a contemporary of Bentham and James Mill attempted to develop a social theory of state based on the science of positivism to explain the intellectual developments of eighteenth century. ‘Enlightenment’ unlike the classical liberals Comte places more importance on the society and considers ‘family’ as the basic unit of social analysis. Comte places the functional analysis perspective of the state and function of the government is to maintain peace, order and stability in the society<sup>55</sup>.

Disorder can be prevented by setting up of government to bring social harmony. This functional analysis is carried further in the works of E. Durkheim, where the concept of the state emerges in a clearly functionalist nature which performs a variety of functions for the social collectivity or the social organism of the state as well as a moral role of authority to alleviate the problems of the society. Durkheim also presents a pluralist position when he argues that occupational groups, corporations or secondary groups are required to maintain flows of communication between individuals and the state and to counter balance the potential abuse of power by those in state institutions<sup>56</sup>.

Max Weber the widely acknowledged sociologist laid the foundation of sociological understanding of human behavior in relation to the society and the state. In his most important work “Economy and Society” published in 1921, Weber presents a complexity of reality that must be interpreted in the context of social actions. According to Weber ‘domination’ is the most important element of social action. Weber considers domination as a special case of power i.e. the possibility of imposing one’s own will upon the behavior of the persons, within the phenomenon of political power.

Applying this aspect of domination in the context of state Weber describes the state as a human community that successfully claims the monopoly of legitimate use of physical force within a given territory. This claim to political legitimacy according to Weber works on three levels i.e. traditional, charismatic and rational-legal authority. The modern state is characterized by legal-rational authority which derives its legitimacy from a rational way of being elected and have been placed in power in a legal way, their actions justifiable according to the written codes of law<sup>57</sup>.

The Marxist and neo-marxist approach towards the state is based on class perspective and the domination of one class over the other. It is different from the mechanistic theory and the organic theory of state. It treats the state neither as a natural institution nor as an ethical institution, but as a class society divided into the 'dominant' and the 'dependent' classes. Marx and Engels have clearly stated that the state is but an instrument of class rule and exploitation. Marx and Engels in their famous work Communist Manifesto (1848) observed that political power, properly to be considered is merely the organized power of one class for oppressing the another<sup>58</sup>.

Lenin in his "The State and Revolution" (1917) elaborated that according to Marx "the state is an organ of class rule, an organ for the oppression of one class by another". It is the creation of 'order' which legalizes and perpetuates this oppression by moderating the conflict between classes. The state which acts as an instrument of class oppression and as an embodiment of social injustice, the Marxian theory looks forward for the emancipation of mankind in a class less, state less society where the state will 'wither away'. It also presented a reductionist view of the state subordinating it to the economic base of the society<sup>59</sup>.

Neo Marxists such as Gramsci, Ralph Miliband, Nicolas Poulantzas have expressed their views on the relative autonomy of the superstructure. Gramsci was the first to concede relative autonomy of the state. Gramsci in his work makes a clear distinction between the civil society and the state which is the part of the superstructure. The superstructure is made up of two levels, first political society which represents state power and exercised force to create its domination and second civil society which was closer to the base and relied on consent for exercising its domination. Civil society acted as the structure of legitimization through various institutions of society such as family, school, churches that created the required consent of domination.

Gramsci emphasized that the state is only one of the institutions in society that helps maintain the hegemony of the ruling class and power is enhanced by the ideological domination of the civil society trying to maintain this hegemony through consent<sup>60</sup>.

Marxism as a political theory has generated immense scientific enquiry and led to the development of critical theory that tries to forge a link between social theory and political practice. “Western Marxism” is the umbrella term often used in referring to this alternative i.e. the ‘critical theory’ of the Frankfurt School especially in the works of Max Horkheimer, Theodor Adorno and Herbert Marcuse with its heir apparent Jurgen Habermas as the most influential philosopher also known as the ‘modernist’ of the tradition of critical theory, followed by a ‘post-modernist’ understanding best acknowledged in the works of Michael Foucault. The scholars of Frankfurt School have tried to preserve Marx’s emancipator, anti-authoritarian intensions by recasting his ideas best suited to the changing historical conditions<sup>61</sup>.

The theories of state that have developed over centuries represent various strands of thought that should be understood in a comprehensive whole to gain a better perspective. Particularly in the context of developing countries moving towards a welfare liberal model of state is a better way of understanding the nature of the state, by addressing the political and economic spheres of activity, in the political sphere representing a form of constitutional government and in the economic sphere it recognizes the developmental aspects.

The attempts to discern the nature of the post colonial state follows a complex understanding on the post colonial nature of politics as well as institutions in bringing about social and economic transformation and better governance to enforce public policies. According to Zoya Hasan two dominant interpretations liberal and the Marxist can be applied to the understanding of the nature



of the post colonial state particularly in case of India and South Asia in general. The agenda of the state was transformations in society brought through the liberal-institutional approach in bringing about social and economic change<sup>62</sup>.

The post colonial state such as in India was guided by two major objectives namely: nation building and social transformation with the later committed to build a developmental state but was faced with constrains. Later in the 1990s the states had to face critical challenge in the economic sphere that led to the adoption of neo-liberal agenda pursuing the policy of liberalization that involves a greater role of market mechanisms due to a combination of internal and external factors. The state institutions were considered as ineffective to provide public goods and services which were implicit in the acceptance of the market as a mechanism to deliver public goods<sup>63</sup>.

Rehman Sobhan is quite categorical when he states that the role of the state in development has come under increasing challenge in favour of delimiting the state in the economic sphere. The more developed and advanced the economy the more critical becomes the role of the state. Yet in developing countries and in least developed country like Bangladesh with a large subsistence sector and an omnipresent informal sector, the capacity of the state to influence development is limited in the economic sector but demands in the socio-economic sphere to deliver goods and services is as usual very high<sup>64</sup>.

In the case of India and Bangladesh it becomes quite relevant to understand how the institutions functions within the overall political system to deliver goods and services the prime function of a state. Since the failure of state led development paradigm, rise of neo-liberal market and roll back of the state in the light of globalization, there has also been a trend to decentralize the state

from its position of monopoly in areas of social control. As a result the idea of governance has gained prominence in recent literature on understanding of the functions of the state and replacing the pre-eminent position of the state to plurality of rules based on participatory democracy<sup>65</sup>.

The concept of governance is as old as human civilization. Deriving from the Greek word “kubernan” meaning pilot or steer or how to design rule making for the functioning of the state it has gained more prominence in recent years. According to A.M. Kjaer, the concept of governance has been defined in different ways depending on the field of study it was used into. In Public Administration governance refers to the ways in which public bureaucrats steer inter and intra organizational networks in process of public sector reforms. In other words in public administration governance has been linked to theories of policy networks<sup>66</sup>.

In comparative political theories governance examines and addresses how the combined efforts of state and civil society institutions under the various political regimes may promote economic and political development. In the field of comparative politics governance was conceived as the tool to capture state-civil society interaction<sup>67</sup>. In the field of international relations, governance was conceived in terms of global governance and more or less as a critique of the dominant neo-realist paradigm that perceives the state as the principal unit of analysis. In other words global governance refers to how nation states, international organizations and transnational corporations interact under conditions of increasing globalization<sup>68</sup>.

The World Bank conceptualized the idea of ‘good governance’ in the context of debt ridden sub-Saharan Africa. Further the publication of World Development Report of 1992 brought out the concept of good governance epitomized by predictable, open, enlightened policy making, a

bureaucracy imbued with professional ethos acting in furtherance of public good, the rule of law, transparent process and a strong civil society participating in public affairs<sup>69</sup>.

The UNDP further elaborated and re-conceptualized the concept of governance in its Report of 1997 entitled “Re-conceptualizing Governance” emphasizing that governance is the essence of economic, political and administrative authority to manage 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 local obligations and mediate their differences. The UNDP Report 1997 articulated eight major characteristics of good governance and these are participation, consensus orientation, accountability, transparency, responsiveness, equitable and inclusive, effective and efficient rule of law which must be applied to achieve good governance<sup>70</sup>.

These developments according to Thomas Weiss have produced new conceptualizations. Now the term governance is no longer only associated with the state and the machinery of government but has incorporated non-governmental organizations, civil society organizations and other informal institutions and networks associated with people’s participation and others that co-existed with the public sector within an organized society or community. This change in perception has also resulted in the understanding of governance as a theoretical and policy process reflecting a transition from the model of state centric to society-centric conception with the incorporation of non state actors depending increasingly on the state-civil society interaction and the associational interface with international, regional and national regimes<sup>71</sup>.

The management of disasters is considered to be a function of the state and the governance scenario. Disaster management to become meaningful must be supported by the legal and

administrative apparatus of the state. The relevance of the institutions depends on the functions performed within the overall political system to deliver services which is the prime function of a state and the governmental machinery. The present study examines the status of disaster management in both Bangladesh and India. The study after a detailed analysis comes to the conclusion that despite the presence of legal–institutional framework of disaster management and implementation structure there continues to be weak accountability, institutional dysfunctionality, corruption and a lack of effective regulatory mechanism leading to poor realization and enforcement of laws in governance of disaster management issues in both the countries.

Despite a decade of formulation of Disaster Management Act in 2005 in India institutional and developmental capacities are time and again challenged with each passing disaster event. Moreover there are implementation gaps in laws and policies pertaining to disaster management in the performance of respective states. The local level of governance that has a direct associational relation with the people at the grassroot level most of the times lacks effective legislation, institutional framework and decision making capacity to effectively deal with the impending calamities.

In case of Bangladesh this has become more acute due to the low level of development prospects of the country. Being a least developed country Bangladesh became a “test case for development” highly dependent on financial aid from donor partners and as sharply pointed out by Rounaq Jahan in Bangladesh Politics Problems and Issues (2005) that despite repeated changes in the political regimes, the critical issues and problems of governance and politics have

remained remarkably unchanged through all these decades with democratic governance becoming a difficult project for the ruling elites<sup>72</sup>.

Despite facing the grave scenario of disasters the state of Bangladesh has faltered with its policies on management of disaster events that had greater spillover effect on the socio-economic development of the country. Earlier efforts such as the Flood Action Plan in the 1990s considered as a major program to control and manage floods in the major river systems in the country faltered due to not taking into account the affected population that led to civil society activism on environmental matters<sup>73</sup>.

Later the state with the active support from the donor partners started the Comprehensive Disaster Management Program (CDMP 2004-2009) that finally culminated into the enactment of Disaster Management Act 2012. With every successive disaster the institutional and developmental capacities have been challenged. Moreover the slow pace of implementation of policies pertaining to disaster management has impacted the performance of state for disaster risk reduction. The local level of governance that has a direct associational relation with the people at the grassroot level most of the times lacks effective legislation, institutional framework and decision making capacity to effectively deal with the impending calamities often a ground of confrontational politics and corruption and a defective polity that has given rise to ensure democratic governance through civil society participation<sup>74</sup>.

The focus of democratic governance is on interactions with a co-public-private character reflecting on a state-society interrelationship. Taking a cue from J. Kooiman elaboration on the notion of governance “governing can be considered as the totality of interactions, in which public as well as the private actors participate, aimed at solving societal problems or creating

societal opportunities; attending to the institutions as contexts for these governing interactions; and establishing a normative foundation for all those activities<sup>75</sup>. Particularly with the World Bank's formulations justifying market economy as the only viable path to development has also put the idea of governance at the centre stage with a growing role of the civil society to address the issue of corruption and inefficient public administration in developing countries.

Present theoretical formulations on governance has come to be understood as a complex configuration of interrelationship of state-civil society interactions based on numerous networks of negotiations to address various issues of democratic governance. The participation of civil society can become one of the effective measures to ensure promotion and democratization of disaster issues particularly in India and Bangladesh. In recent times civil society activism in both the countries has generated enough interest to discern the broad parameters that can to some extent generate understanding on the implementation of disaster regime in both the countries concerned.

To discern the theoretical underpinnings of the concept of civil society one can look forward to the rich political history embedded in western political thought starting from Aristotle to Gramsci. But it was in the last decade of the twentieth century that the idea of civil society was re-conceptualized to understand the growing complexities of state-(civil)-society interrelationship globally revived during the early 1990s and given new contemporary meanings by intellectuals and social activists in Eastern Europe and Latin America against totalitarian governments<sup>76</sup>.

It was quite natural for these ideas to find the base into the development discourse grounded in neoliberal development policy and as a component of new emerging discourse on good

governance. The participation of global civil society has also intensified throughout the last decade in promotion of transnational activities for realizing common good. Global civil society is realized as a social sphere characterized by formal and informal structures and trans-boundary organizations, social movements and individual's voluntary associations, interwoven by social networks of activities and relations that also help in the process of global governance<sup>77</sup>.

Etymologically speaking the idea of civil society means a 'free space' that has been institutionalized in the context of and outside the legal and structural dimensions of the state. Civil society can also be regarded as the arena where citizens protect their freedom from the state on one hand and the market on the other, given the growing trends towards globalization of economies in the current scenario. Sometimes it is also regarded as the 'third sector' besides the state and the market to protect the interests of the individuals within the society<sup>78</sup>.

The origins of the concept of civil society can be located on the larger western philosophical plane as Aristotle's "koinonia politike". In its original position it allowed no distinction between 'state' and 'society' or between political and civil society. It simply meant a community, a collection of human beings united within a legitimate political order and was variously rendered as society or community. Later it was Hobbes who examined the dichotomy between the civil society and state of nature. There is always a threat of war in the 'state of nature'. To come out of this incivility to 'civility' men form a social contract whereby individuals voluntarily give up all their 'rights to the sovereign' or 'leviathan' and through a social contract they create a civil society and thereby a state<sup>79</sup>.

Subsequently it was Locke a contemporary of Hobbes who elaborated the concept of civil society. Locke regarded the civil society as the historical remedy for the 'inconveniences of the

state of nature' by placing the rights of the individual to legitimate political authority<sup>80</sup>. Locke at the same time made no separation between the civil society and political society as John Dunn states that for Locke "in no sense was civil society conceived of as distinct from an entity termed the state" as 'a civil society can in principle be the effective remedy for the state of nature'. Locke established the liberal view of civil society where the individuals had the capacity to judge the violations to the law of nature which laid the foundation of liberal democratic politics<sup>81</sup>.

Sudipto Kaviraj offers a penetrating analysis of the difference between Hobbesian, Lockean and Hegelian conceptualization of civil society. It was in the nineteenth century, that Hegel re-conceptualized civil society that marks a systematic departure from Locke and Hobbes 'state of nature'. He points out that "by introducing a tripartite division of forms of socialibility (family, civil society and state) Hegel brought the narrow dichotomy between the state and civil society into a complex connection with other significant opposition between public and private sphere.

While the private sphere reflected the family, the public sphere or universal ideas are represented by the civil society. Hegel conceptualized civil society in terms of particular subjective needs of the individual that can be fulfilled in cooperation with other. It was a reconciliation of the individual self interest with the demand of the community or to reconcile particularity (economic interests) with the universality (to the state). Hegel thus presented a symbiotic relationship between the state and civil society. The apparatus of the state is an integral part of the civil society and civil society represents the sphere of freedom that permeates the state<sup>82</sup>.

Marx on the other hand, totally discarded the symbiotic relationship proposed by Hegel between the civil society and the state. Marx was skeptical of Hegel's presumption that individual's



particular interests can be reconciled with the universal interest. Civil society for Marx meant the bourgeoisie society wherein the economically dominant class would utilize the state to further its own interests. The economic sphere became the guiding principles for civil society. Civil Society arose as a separate sphere, an arena of market forces structurally separate from the formal state power, the civil society that forms the base and the rest as the idealistic superstructure Hegel ultimately subordinated the civil society to the state whereas Marx emphasized the primacy of civil society over the state<sup>83</sup>.

Neo-Marxist differed from the classical Marxian tradition with regard to the concept of civil society. Joseph Femia correctly points out that for classical Marxist tradition civil society refers to the infrastructure, the totality of material conditions and relationships. But civil society in Gramsci's writings belongs to the superstructure, since it comprises the ideological cultural relation that creates hegemony by consent. Gramsci associated the state as an instrument of coercion and domination and identified the civil society with the creation of consent for hegemony through various institutions of the civil society. Thus the state creates the conditions with the support of the civil society in its hegemony over the individuals within the system. This conceptualization of civil society has been translated into an autonomous role played by the superstructure in sustaining the capitalist society<sup>84</sup>.

Threading through the maze of literature available on the dominant narrative regarding the concept of civil society it could be regarded as a "contested concept". But in the current scenario as Neera Chandhoke critically points out it has become a "consensual concept" – a matter of universal acclaim. With the triumph of neo-liberalism, it has been readily appropriated and perfectly fitted into a minimalist version of democracy<sup>85</sup>.

The logic behind the rise of civil society was the gap created by the 'rolling back of the state' from the social sector and markets furthering democracy, and the place has been taken up by the various non-governmental organizations, civil society groups and voluntary organizations that are presented as an arena of solidarity, self help and goodwill to cater to the needs of the people particularly working in the context of developing countries

The civil society emerged as the rider of development policies of non state actors and multilateral financial institutions and was also strengthened by the conditional donor policy of the donor countries and World Bank conditionalities for granting of financial assistance to address the issue of development in these countries. Now this attitude has changed to a more proactive institutional reforms for strengthen the instruments of political conditionalities<sup>86</sup>. Today non-governmental organizations play a larger than life role in areas such as health, education, women's empowerment, human rights and human security issues.

Looking through the prism of civil society narrative particularly in case of Bangladesh D. Lewis points out that the combination of massive post colonial after war reconstruction effort in 1971 and the devastating cyclone that soon followed created a huge local and international relief and reconstruction measure sowing the seeds of non-governmental (NGO) sector in Bangladesh. Continued problems of underdevelopment, widespread disillusionment with the political system with top-down approach of the military regimes and recurring natural disasters, relief and development was taken up by the NGO's established by the civil society members of the new emerging middle class in Bangladesh<sup>87</sup>.

Also becoming the larger recipient of international development assistance these local NGO's acquired a distinctive identity working in emergency relief work and service delivery across

various sectors. Particularly the role of BRAC starting its journey as a humanitarian relief organization in 1972 and later transforming into a multifaceted development agency, Grameen Bank experimenting with the innovative concept of “microcredit financing” to address rural poverty and women empowerment successful to a massive extent possible to uplift the rural poor is a case to the point. Prosiksha a pro-left civil society organization undertaking development and community organizing work, linking with grass root empowerment politics and service delivery for a wide range of sectors as well as other local NGO’s associated with relief and development and engaged in capacity building of the communities across the country<sup>88</sup>.

Besides the local non state actors there is a large presence of international non-governmental organization’s community such as Oxfam, CARE and others who are actively involved in relief and rehabilitation as well as in capacity building projects run by them and other multilateral financial institutions though not free of criticism that follows with their functioning in the political-social arena<sup>89</sup>.

In case of India civil society is viewed more as a political space where the social actions take shape to influence and change policy perceptions. According to Partha Chatterjee the western notion of civil society is of little relevance to the majority of the poor in post colonial societies as they are compelled to live beyond the organized world of citizenship, pluralism and associations. Partha Chatterjee addresses the concept of civil society from the point of “political society” that reflects the realities of the people who are made to engage with the state through a forced participation that takes place not through civic organizations but through building clientelistic linkages with the ruling elite<sup>90</sup>.

This “political society” needs to play a proactive role in highlighting the predicament of the poor and the marginalized and demand for welfare is considered as a common good. The degree to which these pressures will be successful will finally depend on the strategic manoeuvres operating in the political society. Since the 1970s a number of NGO’s and civil society organizations have been engaged in the social-environmental movements (Chipko Movement, Narmada Bachao Andolan and others (to name a few) to ensure development of the people. Various other local and national initiatives have helped to build the political space for civil society maneuverings. Similarly in the disaster scenario many local and national NGO’s are engaged to provide relief and rehabilitation to the people as well as engaged in creating awareness among the people regarding disaster vulnerabilities and risks associated with hazards. The Barh Mukti Abhiyan a local NGO working in the field of flood related issues in Bihar for the last thirty years is a case to the point.

In the arena of disaster management the civil society and the vast NGO sector has an important role to play in the sensitizing the policy makers and the society for the promotion and strengthening the disaster management regime in their respective countries. The civil society has an educative role to play, create awareness at the societal level as well as create pressure for concerned authority for building and strengthening measures for the betterment management of disasters in future. Through proper advocacy of legal-institutional framework and capacity building of the concerned communities the civil society can set a progressive disaster resilient society that will have the capacity to deal with the devastating impact of disasters recurrently faced in these countries.

Despite the poor performance of the state in social sector and disaster management in particular, where the state has failed to perform its prerequisite function, the state in post colonial societies has not lost its vigour and is still considered the main agent to deliver goods and services to the citizens. Civil society and the state although distinct are never wholly autonomous in their relations with each other. Neera Chandhoke points out that the civil society representatives need to be strengthened and the domains of civil society and political society have to be seen not as alternatives to each other but as prerequisites for each other<sup>91</sup>. The limited state in neo-liberal philosophy cannot still be deprived of its necessary power to maintain the rule of law, security and justice. On the other a strong civil society can flourish only with a strong state, maintaining effective political institutions, rules and order. It is to be noted that civil society is most often understood as a democratic society and democracy presupposes the existence of civil society.

At present the study after analyzing various issues in disaster management have come to the factual position that in India and Bangladesh the disaster management policy is still dominated by “relief centric approach” and even the process of mainstreaming of disaster management policy in development plans and policies is slow in progress. The institutions needed to ensure efficient management of disasters are either weak or un-operational during emergencies. The growing population and increasing demands on resource distribution has put immense pressure on the scarce resources generating greater risks and vulnerabilities than the ability of the community or policy response to cope with it<sup>92</sup>.

Measures have been taken to ensure civil society participation to develop a holistic approach to disaster management moving towards proactive approach of community preparedness, capacity building and disaster risk reduction thereby creating a “culture of preparedness”. The

questionnaire survey circulated for this purpose also corroborates the fact that majority of the respondents were of the opinion the civil society particularly in Bangladesh plays a very active role in disaster management. In this group quite a few were of the opinion that the civil society also plays an effective role in disaster mitigation and civil society organizations as well as NGOs both national and local are involved in capacity building exercises.

Moreover the approach that can best address disaster issues in India and Bangladesh reflects a collaborative approach between the state and civil society to address disaster issues which is emerging as the current paradigm in disaster risk reduction that advocates mobilizing community participation in decision making process and creating awareness among communities for disaster risk reduction strategies so as to deal with human insecurities arising out of this predicament.

Against the above backdrop identifying the best suitable theoretical explanation to address the current issue of research provides justification to take up the (new) institutional approach to bring out the theoretical underpinnings of the subject under review. The focus of institutionalism is to put emphasis on institutions at the state and international level that also exhibits the capacity to wield considerable power within the organizational setup. Such views find resonance in the international realm particularly in the works of realist/ neo-realist theorists measuring state capacity in terms of power relationship and the function of the state to maximise power in relation to competing states. New institutionalism on the other is not only concerned with the informal conventions of political life but is also concerned with formal constitutions and organizational structures at the international level. Attention is now geared towards the way in which institutions embody values and power relationships and at the same time to the obstacles

and opportunities that confront institutional designs to bring in cooperation, coordination and collaboration on emergent issues for the benefit of the greatest number of people<sup>93</sup>.

As was discussed earlier regime theory does also offers a plausible explanation to address the issue of coordination among states seeking same interests. Regimes come into existence to overcome collecting goods dilemma by coordinating the behavior of states on specific areas of concern. Although states continue to seek their interest, they create framework to coordinate with other actors if required to realize the goal of self interest. But a critical analysis of regime theory reveals that though it has emerged from neo liberal theory of international relations, the fundamental assumptions are based on the fact that states are rational egoists operating in an anarchical system<sup>94</sup>.

How regimes or cooperation is possible among rational egoists under anarchy is a question that requires a detailed inquiry. This is a classic collective action problem of the actors in the international arena. In the domestic arena the task of the government is to solve problems of collective action by enforcing compliance with a system of orders, rules and principles in the common interest. This brings in the theory of hegemonic stability (structuralism and power dominance) widely employed to explain regime dynamics. It links regime creation and maintenance to a dominant power's existence and weakening of regimes to a waning hegemon<sup>95</sup>.

As such the theory of hegemonic stability has been challenged both on empirical and theoretical grounds. Firstly the threat of power analysis is a risk for structures of regime dynamics and secondly since structure is a poor indicator of regime characteristics, actors may revert time and again to domestic variables to substantiate hegemonic stability calling into question the primacy of structural theory. Regimes are clearly seen as a part of global governance guided by structure—

power dynamics where states cooperate in their interest but the cost of cooperation is carried by other that may become the cause of strain in the relationship among states/actors<sup>96</sup>.

At this critical juncture we may need theories that may link the international with domestic processes to provide justification to collective good/action both at the domestic and international level. Addressing this from the new institutional perspective becomes quite clear because actors cooperate and there are absolute gains from cooperation because in neoliberal assumptions power dynamics of the hegemon is not applicable. Neo-liberal institutionalism in the context of international relations discards the nature of calculating self-interest in order to achieve greater good of the greatest number of people. This implies a convergence of interests that means the participants in the international or state system have similar ideas of cooperation and rules that govern their mutual participation as each is expected to play their role according to the same rules and norms so as to coordinate the behavior of individual states at the national or international level<sup>97</sup>.

An in depth analysis brings out new institutional approach being bifurcated into four major strands: historical institutionalism (puts emphasis on cultural approaches to examine institutions over time and space), constructivist institutionalism (considers that preceding institutionalism has failed to adequately address the issue of institutional change), rational choice institutionalism (provides a simple and useful tool to make proper calculations and predictions for choices) and neo-liberal institutionalism (assumes that states maximize their power through a cooperative world order)<sup>98</sup>.

Disaster management to become effective in post colonial states of South Asia must take into account the plausible new institutional approach that concerns itself not only with the impact of



institutions on individuals but with the interaction between the institutions and individuals<sup>93</sup>. In this context rational choice institutionalism provides a simple but useful tool to maximize their choices. Actors in international relations are instrumentally rational and seek to maximize their utility. Similarly neo-liberal institutionalism operates within a rational paradigm where states seek to cooperate to maximize benefits and facilitate interdependence based on mutual trust.

Disaster management requires both rational choice of the state/actors where clearly laid down rules, laws and norms direct the disaster mitigation and preparedness policy for maximum utilization within the state and neo-liberalism to facilitate interdependence based on mutual trust to effectively build a disaster regime guiding states to cooperate and achieve absolute rather than relative benefits at the international level. In this way an effective system of disaster management could bring about the desired result of seeking sustainable development and human security concerns of millions of people affected by disasters and particularly in South Asia including Bangladesh and India.

To **conclude** working on the present study was an attempt to prepare the contextual background for securitization disaster as a non traditional security threat that requires systematic and long term response for mitigation. The shift in approach to address disaster from “relief and response” to “risk management” requires long term mitigation activities and capacity building at all levels of governance. The study has identified that disaster risk management requires strengthening of development plans and policies at the institutional level for effective management of disasters.

The study also highlighted the need to integrate capacity building and vulnerability reduction strategies to build resilient communities characterized by effective governance, participation of the community, civil society and other stakeholders with greater focus on cooperation and

collaborative approach. Finally this study presents a comparative model to evaluate and analyze the consequences of disasters as a threat to human security and sustainable development in two or more countries so as to facilitate mutual interdependence and trust for future cooperation in the field of disaster management.

Against the above backdrop, an empirical and theoretical discussion has been engaged into for addressing the questions raised in the introduction of the study regarding disaster issues, its management and linkage with sustainable development and human security. The questions raised have been adequately dealt with and successfully addressed to bring out the desired outcome.

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## ***Appendix I: Questionnaire Survey Content Analysis***

As part of the study a structured questionnaire was circulated for obtaining opinion on the issues among experts, academics, researchers, government officials and policy makers, scientists, engineers, persons from NGOs (international, national and local), civil society organizations, media, social activists and people affected by disasters. The selection of respondents was done on the basis of random sampling.

During the survey 250 questionnaires were circulated out of which 148 responded to the questions. A total of 28 questions were provided to the respondents covering broad issues on natural disaster, sustainable development, human security and disaster management in Bangladesh and India. Each question was provided with structured alternatives and/or alternative explanations with open-ended options/ answers.

During the analysis of the questionnaire survey it was observed that the respondents gave their opinions to any one of the options offered to a particular question. The respondents answered according to their preference without giving any priority in order of ranking. It was also observed that there were instances where the respondents gave their own opinion outside the structured alternatives. As a result each opinion and alternative answer was given due weightage on the basis of percentile allotted to them against the total number of respondents (total number of respondents taken as 100% ie. 148 in total numbers).

On the issue of natural disaster and human security and how it is interrelated the options was provided with three possible open-ended answers. Analysis revealed that an overwhelming 96% of the respondents answered in affirmative out of the total number of respondents, no respondent opinionated in negative terms while 4% of the respondents were undecided.

While on the issue of possible linkage between natural disaster and sustainable development and whether natural disaster and its management needs international recognition out of the total respondents 80% were of the opinion that sustainable development is not possible without the

inclusion of disaster issues in development and planning while 12% answered in negative and 8% were left undecided.

The query whether the present international mechanism (Hyogo Framework of Action 2005) has resulted in mainstreaming of natural disaster management plans and policies at the national level the analysis reveals that 60% of the respondents believe international exercise has resulted in mainstreaming of natural disaster management in national plans and policies while 32% of the respondents can't say and 8% of the respondents felt that it has not resulted in mainstreaming of disaster issues.

On the issue of external assistance (humanitarian aid) to a country affected by natural disasters about 95% the respondents said that there is a major role of external assistance during a disaster event. Disaster occur on a larger plane sometimes transcending national boundaries that require immediate rescue and relief only possible with help of external assistance. No respondents gave a negative opinion and 5% of the respondents were left undecided on the issue.

The next query addressed the regional scenario regarding whether all the South Asian states share commonalities of disaster issues. The response of the respondents revealed that 75% of the total respondents agreed that commonalities do exist, 7% of the respondents said that commonalities do not exist while 18% out of the total respondents were unable to form any opinion on this issue.

On the issue of South Asian states having been successful in addressing disaster issues the response revealed that about 68% of the respondents believed that the South Asian states were successful to some extent possible in addressing disaster issues while 30% of the respondents preferred the third explanation that the South Asian state have remained unsuccessful to address disaster issues while only 2% felt that the states have been successful to a large extent possible and no response was there for other reasons in this category.

Within the regional framework (SAARC) the query attempted to elicit opinion on whether the parameters and modalities addressing disaster issues were adequate. Three broad possible explanations were offered regarding the role of SAARC as a regional organization in addressing disaster issues. Analysis revealed that out of the three explanations that was offered 55% of the

respondents felt that for SAARC as a regional framework addressing disaster issues has been not adequate, only 15% were of the opinion that it was adequate while rest of the 30% were undecided in their opinion and can't say was the reply while no other explanation was offered by any of the respondents.

In the context Bangladesh 100 questionnaires were circulated out of which 60 responded to the questions provided in the opinion survey till the finalization of the report. On the issue of incorporating disaster management in national development plans and policies in Bangladesh the response of the respondents was 72% in the affirmative category while 28% were in the can't say category and none of the respondents were in the negative category.

On the question of Bangladesh being faced with the perennial problem of natural disaster and poverty among the South Asian states about 95% of the respondents agreed that Bangladesh is highly impacted by disaster events and the incidence of poverty increase with each disaster. Only 5% of the respondents felt that poverty is not driven by natural disasters as there are other problems of development.

On the role of the state in Bangladesh in addressing disaster vulnerabilities, 55% of the respondent felt that to a greater extent that the state plays a major role in addressing disaster vulnerabilities in Bangladesh. The state has to a great extent been able to incorporate disaster issues for mainstreaming in planning and development while no one responded in the second category of explanation that offered that the state has no role to play in addressing disaster vulnerabilities which left a large group of respondents about 45% who were undecided. Interestingly in this group of respondents quite a few were of the opinion that mainstreaming of disaster management in plans and policies have been rather slow.

On the issue of effective system of governance in addressing disaster vulnerabilities 75% of the respondents revealed that disaster events bring out the governance capacity of the state and functioning of the government in the public sphere which has been less than effective. On the other note 15% of the respondents felt that the functioning was effective while 10% were in can't say category and no other opinion was expressed.

On the issue of civil society playing a major role in disaster management in Bangladesh out of the total respondents 90% were of the opinion that in Bangladesh the civil society plays a very active role in disaster management. In this group quite a few were of the opinion that the civil society also plays an effective role in disaster mitigation and involved in capacity building exercises. None of the respondents answered the second option that civil society organizations play no effective role in disaster management while 10% of the respondents were in the undecided category.

On the issue of civil society working more successfully in creating awareness on disaster issues the analysis reveals that the respondents out of the total, 85% answered in affirmative that the civil society organizations are quick in response and plays an effective role in creating awareness on disaster issues. There were respondents who had no opinion on this matter while 15% of the respondents belonged to can't say category and other opinions were not expressed.

In the context of India 150 questionnaires were circulated out of which 88 responded to the questions. On the issue of incorporating disaster management in national development plans and policies the response of 60% of the respondents was in the affirmative category while 25% were in can't say category and 15% were of the respondents were in the negative category.

During the analysis of the response on the issue of India being faced with the perennial problem of natural disaster and poverty among the South Asian states, 70% of the respondents felt that the incidence of poverty has a close link with natural disaster with 20% of the respondents felt that poverty is not driven by natural disasters as there are other problems of development in India and 10% of the respondents opted for the undecided category with no other opinions offered.

Regarding the role of the state in India, the survey analysis reveals that in addressing disaster vulnerabilities, 65% of the respondent felt that to a greater extent the state plays a major role in addressing disaster vulnerabilities while no one responded in the second category of explanation that offered saying the state has no role to play in addressing disaster vulnerabilities which left respondents about 35% who were undecided. Interestingly in this group of respondents quite a few were of the opinion that mainstreaming of disaster management in plans and policies have been rather slow and segregated response of the state to disaster events.

On the issue of India having an effective system of governance in addressing disaster vulnerabilities there were 66% of the respondents who expressed that disaster events bring out limitation of the governance capacity of the state which has been less than effective most of the times. On the other hand 20% of the respondents felt that the functioning was effective while 14% were in can't say category and no other opinion was expressed.

On the issue of civil society organizations playing an effective role in disaster management in India the responses of the respondents revealed that 62% were of the opinion that the civil society organizations and NGOs play a very active role in disaster management, 8% were of the opinion that civil society organizations play no effective role in disaster management while 30% of the respondents were in the undecided category.

In reference to the query whether civil society in India works more successfully in creating awareness on disaster issues the analysis reveals that 58% of the respondents were in affirmative while 22% of the respondents felt that the civil society in India not been successful in creating awareness on disaster issues and 20% of the respondents belonged to the can't say category and other opinions were not expressed.

Few queries were based on a comparative understanding of disaster issues in Bangladesh and India. Interestingly the analysis reveals that on the question that whether the role of the state in India and Bangladesh in addressing natural disaster issues seems adequate, 68% of the respondents opinionated that the state's response to disasters seems inadequate, only 14% of the respondents felt the measures were adequate while the rest 18% were undecided in their opinion.

On the issue that whether both India and Bangladesh require better governance in disaster risk reduction an overwhelming 88% of the respondents agreed that better governance is required to manage disaster issues as it impacts the socio-economic wellbeing of the people concerned and the rest 12% of the respondents were in the can't say category while none of the respondents gave a negative opinion and no alternative opinions were offered.

On the issue of civil society being capable of better management of disaster issues both in India and Bangladesh the response of the respondents in both the countries reveals that 62 % of the total respondents agreed with the second option that civil society is not the only agency to

manage disaster issues. The State in developing countries like India and Bangladesh has the institutional apparatus and capacity though constrained at times to deal with the management of disasters. None of the respondents agreed with the first explanation and the rest 38% did not give any opinion at all.

The approach that can best address disaster issues both in India and Bangladesh, the survey analysis reveals that all three explanations were approached by the respondents, with the third approach generating most responses about 65% that reflected a collaborative approach between the State and civil society to address disaster issues while bottom-up approach was given second preference with 25% and the top-down approach generated 10% of the total opinions.

During times of disaster whether the States should be governed more by international, regional or national mechanisms for disaster management it is interesting to note that all the four explanations elicited opinion from the respondents. An overwhelming majority of about 78% respondents said that during disasters the States shall be governed by national mechanisms, while 12% gave opinion in favour of regional mechanism, 2% of the respondents went for the international mechanisms for disaster management and the rest 8% were unable to form any opinion on this question

On the issue whether the present mechanisms and strategies for disaster risk reduction at the international, regional and national level requires evaluation of practical realities for managing disasters it was quite interesting to note that the 78 % of the respondents were for a re-evaluation of the mechanisms taking into account country specific practical realities (socio-economic and political) 5% of the respondents not opting for any re-evaluation and 17% of the rest of the respondents were unable to frame their opinion.

The analysis ends with the issue of external influences during disaster brings back the question of state sovereignty to the forefront to which the response of the respondents were more or less divided between the first two alternatives of yes with 40% and no with 45%. About 15% of the respondents also preferred the third explanation of can't say as they were undecided on this issue with no alternative opinions offered in this regard.

**QUESTIONNAIRE SURVEY**

**RELATED TO Ph.D DISSERTATION**

**(DEPARTMENT OF INTERNATIONAL RELATIONS)**

**JADAVPUR UNIVERSITY**

Respected Sir/Madam

I am an Assistant Professor (Senior) with the Department of Political Science, Vivekananda College For Women Kolkata. I have been registered for my Ph.D Programme in the Department of International Relations, Jadavpur University, Kolkata.

In accordance with the requirements for the fulfillment of my PhD Dissertation a Questionnaire Survey is being carried out in this regard. I would sincerely request you to provide your valuable response and suggestions to the outlined questionnaire survey and oblige. Your contribution will be duly acknowledged in my Ph.D Dissertation.

Thanking you,

Yours Sincerely,

(Minu Sinha Ratna)

Department Of International Relations

Jadavpur University. Kolkata

## APPENDIX II: QUESTIONNAIRE SURVEY SAMPLE

Please Do Respond To The Following Questionnaire With A Tick To The Boxes Provided Below Or Add Another Sheet For Your Opinion If Required.

Please Tick (✓)

**1. In your opinion, is natural disaster and human security interdependent?**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**2. Can sustainable development be possible without the inclusion of disaster management?**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**3. Natural Disaster and its management need international recognition.**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**4. The present international mechanism (Hyogo Framework for Action 2005-2015) resulted in the mainstreaming of natural disaster management plan at the national level.**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**5. There is a major role of external assistance (humanitarian as well as aid) to a country affected by natural disasters.**

- a) Yes
- b) No
- c) Can't say



d) Other opinion, if any

**6. South Asian states as is known to all share commonalities regarding disaster issues.**

a) Commonalities do exist.

b) Commonalities do not exist.

c) Can't say

d) Other opinion, if any

**7. The South Asian states have been successful in addressing disaster issues.**

a) Successful to a large extent possible.

b) Successful to some extent possible.

c) Have remained unsuccessful.

d) Other reasons, if any

**8) Within the regional framework of SAARC, are the parameters and modalities addressing disaster issues, adequate.**

a) Yes

b) No, not adequate

c) Can't say

d) Other opinion, if any

**9. The national development plan and policies of Bangladesh have incorporated disaster related issues.**

a) Yes

b) No

c) Can't say

d) Other opinion, if any

**10. Among the South Asian Countries, Bangladesh is faced with its perennial problem of natural disaster and poverty.**

a) Natural disasters and poverty are closely linked.

b) Poverty is not driven by natural disaster.

c) Can't say

d) Other opinion, if any

**11. The state in Bangladesh plays a major role in addressing disaster vulnerabilities.**

- a) Yes, the state plays a significant role in reducing disaster vulnerabilities.
- b) No, the state has no role to play
- c) Can't say
- d) Other opinion, if any

**12. Bangladesh has an effective system of governance in addressing disaster vulnerabilities.**

- a) The governance is effective.
- b) The governance is less effective.
- c) Can't say
- d) Other opinion, if any

**13. What is the role of civil society organizations in disaster management in Bangladesh?**

- a) The civil society organizations play an effective role.
- b) The civil society organizations plays no effective role.
- c) Can't say
- d) Other opinion, if any

**14. Do you think that the civil society in Bangladesh work more successfully in creating awareness on disaster issues?**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**15. The national development plan and policies of India have incorporated disaster related issues.**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**16. Among the South Asian Countries, India also has to deal with the problem of natural disaster and poverty.**

- a) Natural disasters and poverty are closely linked.
- b) Poverty is not driven by natural disaster.
- c) Can't say

d) Other opinion, if any

**17. The state in India plays a major role in addressing disaster vulnerabilities.**

a) Yes, the state plays a significant role in reducing disaster vulnerabilities.

b) No, the state has no role to play

c) Can't say

d) Other opinion, if any

**18. India has an effective system of governance in addressing disaster vulnerabilities.**

a) The governance is effective.

b) The governance is less effective.

c) Can't say

d) Other opinion, if any

**19. In India the civil society organizations plays an effective role in disaster management.**

a) The civil society organizations play an effective role.

b) The civil society organizations plays no effective role.

c) Can't say

d) Other opinion, if any

**20. Do you think that the civil society in India work more successfully in creating awareness on disaster issues?**

a) Yes

b) No

c) Can't say

d) Other opinion, if any

**21. The role of the state in India and Bangladesh in addressing natural disaster issues seems adequate.**

a) Yes

b) No

c) Can't say

d) Other opinion, if any

**22. Both India and Bangladesh require better governance in disaster risk reduction.**

a) Yes

b) No

- c) Can't say
- d) Other opinion, if any

**23. Do you think that only civil society is capable of better management of disaster issues in India and Bangladesh?**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**24. Which approach can best address disaster issues in India and Bangladesh?**

- a) Top-down approach.
- b) Bottom-up approach.
- c) Collaborative approach between the State and the Civil Society.
- d) Can't say.

**25. For better reduction of disaster risk, regional co-operation remains the only mechanism.**

- a) Yes
- b) No
- c) Can't say
- d) Other opinion, if any

**26. In times of disasters the State will be governed more by international, regional and national regime for disaster management.**

- a) International mechanism for disaster management
- b) Regional mechanism for disaster management
- c) National mechanism for disaster management
- d) Can't say

**27. The present mechanisms and strategies for disaster risk reduction at the international, regional and national level requires evaluation of practical realities for managing disasters.**

- a) Yes
- b) No
- c) Can't Say
- d) Any other opinion, If any

**28. The external influences during disaster management bring back the sovereignty of the State issues to the forefront.**

a) Yes

b) No

c) Can't say

d) Other opinion, if any

**Respondent:**

**Name-**

**Designation**

**Place of occupation and address**

**Address**

Surveyed by

Minu Sinha Ratna (Ph.D. Scholar)

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## **ABBREVIATIONS**

<b>ADB</b>	<i>Asian Development Bank</i>
<b>ADSR</b>	<i>Annual Disaster Statistical Review Report</i>
<b>BCCSAP</b>	<i>Bangladesh Climate Change Strategy and Action Plan</i>
<b>BDRCS</b>	<i>Government of Bangladesh and Bangladesh Red Crescent Society</i>
<b>BELA</b>	<i>Bangladesh Environmental Lawyers Association</i>
<b>BMA</b>	<i>Barh Mukti Abhiyan</i>
<b>BMD</b>	<i>Bangladesh Meteorological Department</i>
	<i>Bridging Resources Across Communities, formerly known as Bangladesh Rural Advancement</i>
<b>BRAC</b>	<i>Committee</i>
<b>BWDB</b>	<i>Bangladesh Water Development Board</i>
<b>CAG</b>	<i>Comptroller and Auditor General Report</i>
<b>CARE</b>	<i>Cooperative for Assistance and Relief, formerly Cooperative for American Remittances to Europe</i>
<b>CDM</b>	<i>Clean Development Mechanism</i>
<b>CDS</b>	<i>Commission on Sustainable Development</i>
<b>CHS</b>	<i>Commission on Human Security</i>
<b>CMDRR</b>	<i>Community Managed Disaster Risk Reduction Programme</i>
<b>CPP</b>	<i>Cyclone Preparedness Programme</i>
<b>CRED</b>	<i>Centre for Research on Epidemiology of Disaster</i>
<b>CSO</b>	<i>Civil society organizations</i>
<b>CWC</b>	<i>Central Water Commission</i>
<b>DMB</b>	<i>Disaster Management Bureau</i>
<b>DRR</b>	<i>Disaster Risk Reduction</i>
<b>ERC</b>	<i>ERC Emergency Relief Coordinator</i>
<b>ESCAP</b>	<i>Economic and Social Council for Asia and the Pacific</i>
<b>FAO</b>	<i>Food and Agriculture Organization</i>
<b>FAP</b>	<i>Flood Action Plan</i>
<b>GB</b>	<i>Grameen Bank</i>
<b>GBM</b>	<i>Ganga–Brahmaputra–Meghna River Basin</i>
<b>GDP</b>	<i>Gross Domestic Product</i>
<b>GEF</b>	<i>Global Environment Facility</i>
<b>GFCB</b>	<i>Ganga Flood Control Board</i>
<b>GFCC</b>	<i>Ganga Flood Control Commission</i>
<b>GFDRR</b>	<i>Global Facility for Disaster Reduction and Recovery</i>
<b>GoB</b>	<i>Government of Bangladesh</i>
<b>GoI</b>	<i>Government of India</i>
<b>GSI</b>	<i>Geological Survey of India</i>
<b>HDI</b>	<i>Human Development Index</i>
<b>HFA</b>	<i>Hyogo Framework for Action</i>
<b>HPC</b>	<i>High Powered Committee</i>
<b>IAS/ISDR</b>	<i>Inter-Agency Secretariat for UN/ISDR</i>
<b>IATF/DR</b>	<i>Inter-Agency Task Force on Disaster Reduction</i>
<b>ICIMOD</b>	<i>International Centre for Integrated Mountain Development</i>
<b>IDNDR</b>	<i>International Decade for Natural Disaster Reduction</i>

<b>IFRC</b>	<b><i>IFRC&amp; RC International Federation of Red Cross and Red Crescent Society</i></b>
<b>ILR</b>	<b><i>Inter-Linking River Project</i></b>
<b>IMD</b>	<b><i>Indian Meteorological Department</i></b>
<b>IN-JCWR</b>	<b><i>Indo-Nepal Joint Committee on Water Resources (IN-JCWR)</i></b>
<b>IPCC</b>	<b><i>Inter-Governmental Panel on Climate Change</i></b>
<b>ISDR</b>	<b><i>International Strategy for Disaster Reduction</i></b>
<b>KCHL</b>	<b><i>Kosi High Level Committee</i></b>
<b>MDG</b>	<b><i>Millennium Development Goals 2000</i></b>
<b>MHA</b>	<b><i>Ministry of Home Affairs</i></b>
<b>MoEF</b>	<b><i>Ministry of Environment and Forest</i></b>
<b>MoFDM</b>	<b><i>Ministry of Food and Disaster Management</i></b>
<b>NAPA</b>	<b><i>National Adaptation Program of Action</i></b>
<b>NAPCC</b>	<b><i>National Action Plan on Climate Change</i></b>
<b>NBA</b>	<b><i>Narmada Bachao Andolan</i></b>
<b>NBAP</b>	<b><i>National Biodiversity Action Plan</i></b>
<b>NBSAP</b>	<b><i>National Biodiversity Strategy and Action Plan</i></b>
<b>NDMA</b>	<b><i>National Disaster Management Authority</i></b>
<b>NDRF</b>	<b><i>National Disaster Response Fund</i></b>
<b>NGO</b>	<b><i>Non-governmental organization</i></b>
<b>NIDM</b>	<b><i>National Institute of Disaster Management</i></b>
<b>NWPo</b>	<b><i>National Water Policy</i></b>
<b>OCHA</b>	<b><i>Office for the Coordination of Humanitarian Affairs</i></b>
<b>OSDMA</b>	<b><i>Orissa State Disaster Management Authority</i></b>
<b>RBA</b>	<b><i>Rashtriya Barh Ayog (RBA) or National Flood Commission of India</i></b>
<b>SAARC</b>	<b><i>South Asian Association for Regional Cooperation</i></b>
<b>SACEP</b>	<b><i>South Asia Cooperative Environment</i></b>
<b>SDG</b>	<b><i>Sustainable Development Goals</i></b>
<b>SDMA</b>	<b><i>State Disaster Management Authority India</i></b>
<b>SDMC</b>	<b><i>SAARC Disaster Management Centre</i></b>
<b>SMRC</b>	<b><i>SAARC Meteorological Research Centre</i></b>
<b>SoE</b>	<b><i>State of the Environment Report, Government of Bangladesh</i></b>
<b>SoE</b>	<b><i>State of Environment Report, Government of India</i></b>
<b>SZMC</b>	<b><i>SAARC Coastal Zone Management Centre</i></b>
<b>UN</b>	<b><i>United Nations Human Development Report</i></b>
<b>UNCED</b>	<b><i>United Nations Conference on Environment and Development</i></b>
<b>UNDP</b>	<b><i>United Nations Development Programme</i></b>
<b>UNEP</b>	<b><i>United Nations Environment Programme</i></b>
<b>UNICEF</b>	<b><i>United Nations Children's Emergency Fund</i></b>
<b>UNOPS</b>	<b><i>United Nations Office for Project Services</i></b>
<b>USDMA</b>	<b><i>Uttarakhand State Disaster Management Authority</i></b>
<b>WAPRO</b>	<b><i>Water Resources Planning Organization</i></b>
<b>WCDDR</b>	<b><i>World Conference on Disaster Risk Reduction</i></b>
<b>WDR</b>	<b><i>World Disaster Report,</i></b>
<b>WFP</b>	<b><i>World Food Programme</i></b>
<b>WHO</b>	<b><i>World Health Organization</i></b>
<b>WMO</b>	<b><i>World Meteorological Organization</i></b>