Community Response, Preparedness and Disaster Risk-Reduction
A Case Study of Manipur Floods 2015

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Abstract

The flood of 2015 affected entire Thoubal district and parts of Chandel district in Manipur state of India. According to the government reports, nearly 600 square kilometers of area with over 500,000 populations were affected in the Thoubal and Chandel districts. Majority of the population in the flood affected area are farmers, whose paddy crop cultivation was destroyed and it also affected crop production for the next year due to acute shortage of seeds. Fisheries farms got submerged and people lost livelihood opportunities. Animal life also suffered due to inundation of inhabited plain areas for several days. The market and shops were closed and many were submerged for at least one week. Since it was the season for agricultural plantation, the farmers also suffered from food security for the entire season.

The present study examines causes and consequences that lead to the worst floods of July- August 2015 in the plains of Manipur state. The paper also examines the level of local community response towards prevention and preparedness and disaster risk-reduction. The study indicates the lack of protective and preparedness measures, while dealing with such magnitude of floods hazard.

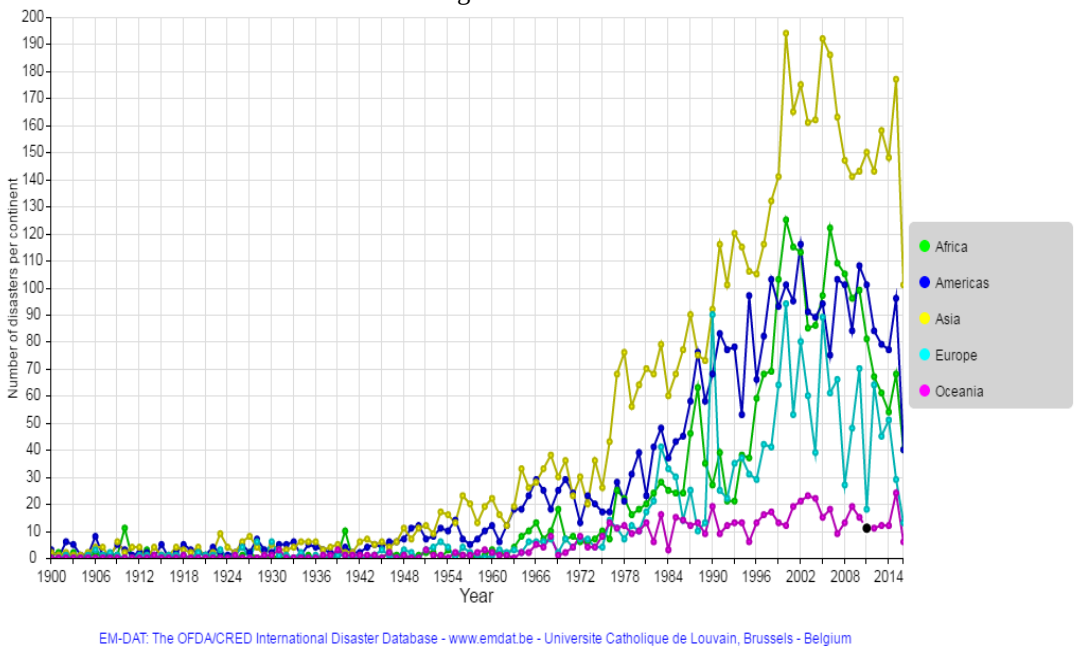
Keywords: Vulnerability, livelihood opportunities, Prevention and preparedness, Disaster risk- reduction, Community resilience

Context

An increasing frequency and trends of both natural and manmade disasters Globally especially in under-developed and developing societies has been taking place (Refer Fig. No 1). The frequency and severity of weather- and climate-related hazards has changed, exposing more people and a greater value of assets to disasters. Climate-related disasters due to

anthropogenic activities are becoming frequent that negatively impacting development progress across the world.

Fig. No. 1



The frequency of all types of hazards in India during last one century has also increased significantly. These hazards have resulted in severe disasters, leading to huge loss of life and total economic damages. A large number of people have been affected by these disasters. (Refer Table No 1)

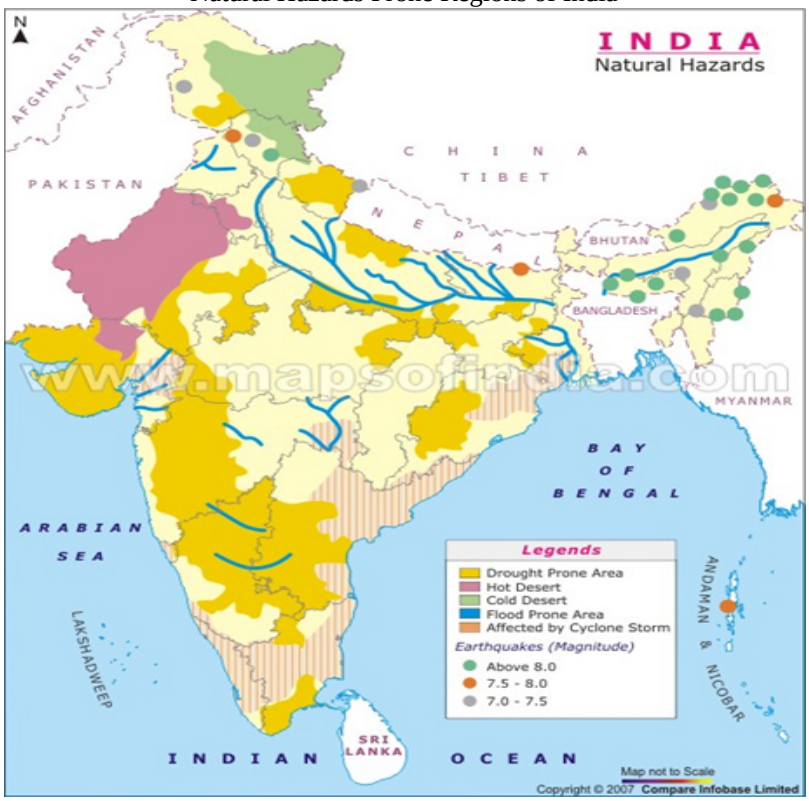
Table No 1

India- Disaster Profile (1900- 2016)

Disaster Type	Events Count	Total Deaths	Total Affected	Total Damages '000'US$
Drought	15	4,250,320	1,391,841,000	2,441,122
Earthquake	32	78,315	28,565,623	5,222,700
Epidemic	62	4,543,581	325,476	N.A
Extreme Temperature	57	17,562	250	544,000
Floods	316	72,334	849,958,256	57,715,188
Landslides	48	5,000	3,848,321	54,500
Storm	142	162,178	102,573,969	20,191,996
Wildfire	2	6	0	2,000

Source: EM-DAT, CRED International Database (December 1, 2016)

Map No. 1
Natural Hazards Prone Regions of India



Source: www.mapindia.com and National Disaster Management Authority of India

India is prone to several hazards especially draught, earthquakes, floods and cyclones. (Refer Map No. 1)

Floods have been one of the major disasters in India leading to nearly 72,334 deaths and huge economic damages during last one century. More than 50 million people have been affected by floods in India during last one Century.

The present study examines causes and consequences that lead to the worst floods of July- August 2015 in the plains of Manipur state. The study evaluates the status of disaster preparedness, response and rehabilitation undertaken by State Disaster Management Authority of Manipur. The study also examines the community response and disaster risk reduction measures adopted by the state for future disaster eventuality. The present study is based on observations and information collected during the field visits. A field visit was also conducted on 10th April 2016 in District Thoubal and District Chandel. Several sites including Vanzing Tentha village in Thoubal District and Rungchang Chakpikarong village in Chandel district of Manipur were visited. These two villages were flooded during July- August 2015.

Flood History of North East India Region

India's Northeastern Region consists of eight states, namely Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. With a total population of 45.53 million (2011 census) and an area of 262,179 square kilometers, the Northeastern Region is relatively sparsely populated compared to much of the rest of India. However, population density varies widely among the northeastern states. Assam and Tripura are the most densely populated followed by Meghalaya and Manipur, while Arunachal Pradesh is the least densely populated (17 persons per square kilometer). (Refer Table 2 and Map No.2)

Table No 2

Comparative Status of North East States and India

States	Population(as per Census 2011)	Area(Sq Km)	Percentage All India		Person(per Sq Km)
			Population	Area	
Arunachal Pradesh	1,382,611	83,743	0.11%	2.54%	17
Assam	31,169,272	78,438	2.57%	2.38%	397
Manipur	2,721,756	22,327	0.22%	0.67%	122
Meghalaya	2,964,007	22,429	0.24%	0.68%	132
Mizoram	1,091,014	21,081	0.09%	0.64%	52
Nagaland	1,980,602	16,579	0.16%	0.50%	119
Sikkim	607,688	7,096	0.05%	0.21%	86
Tripura	3,617,032	10,486	0.29%	0.31%	345
Total NE	45,533,982	262,179	3.07%	7.97%	174
All India	1,210,000,000	3,287,263			374

Source: Census of India, General Population Tables

Natural Hazards and Disasters in North East States

Owing to its specific geo-climatic, geological and physical features, North Eastern Division (comprising of 8 states) are vulnerable to all major natural hazards (Drought, Flood, Cyclone, Earthquake, Landslides, fires etc.). Map No.2 depicts the natural hazards vulnerability regions of India. The North-East states being mountainous topography is also vulnerable to the occurrence of other technological/human caused hazards such as transportation accidents, human induced landslides and terror attacks. Human intervention in terms of development programmes without taking into account carrying capacity of the area, use of appropriate technologies in sync with the natural eco system and local requirements in this fragile eco-system has made the region vulnerable to disasters.

Floods Vulnerability in North East Region

Brahmaputra and Barak river basin falling in the North East Division of India are among the most flood prone areas in the world. The Brahmaputra River flows through Assam from east to west over a length of approximately 650 kilometers. Its main branch originates in the Tibetan plateau, flowing from west to east as the Tsangpo River, and then turns south through the eastern Himalaya as the Dihang River to enter Assam, where it is joined by other branches to form the Brahmaputra. The Barak River rises in the Indian state of Nagaland at an elevation of approximately 2,300 meters and passes through the Manipur Hills of Manipur state over a river length of nearly 400 kilometers. It then flows generally westward from Lakhipur through the Cachar Plains region of Assam over a river length of approximately 130 kilometers to enter Bangladesh near Bhanga.

Map No.2
North Eastern States of India

Flood in Assam, Manipur and Tripura (Three states of North East Division) are characterized by their extremely large magnitude, high frequency and extensive devastation. This natural hazard repeats itself every

year and not only costs lives but also affects the economy of the state, which is largely agricultural. Flood is not a new phenomenon in these three states. (Refer Table No.3)

Frequency of occurrence of floods in Brahamputra and Barak river basins during last 100 years clearly show that these two river basins have recorded excess water discharge and floods. (Refer Table No. 4)

Flood Vulnerability in Manipur

About two third population of Manipur state (1.79 million out of 2.72 million populations, as per Census 2011) is concentrated in the Manipur Valley surrounded by mountain hills, (Manipur valley constitutes only about 8.2% of the state area). Rivers from these mountain hills flow into valley and very often lead to flash floods and landslides during rainy seasons in the mountain areas and flood the plain areas. (Refer Map No.3) All the major river systems of Barak River in the State are vulnerable to flash floods/flooding during rainy season, as captured in the Vulnerability Atlas of Manipur state.

Floods in Manipur Valley is primarily due to heavy rainfall in the upper catchment areas. Intensity of rainfalls is higher in the hilly region than in the plain region. Thus Manipur Valley has large upper catchment area where rainfall is normally high. These good amounts of rainfall feed many streams and rivers, which finally drain, through Manipur Valley (Refer Map No. 4). In the hilly region very steep slopes occupy the major portion. The denuded land due to deforestation in the hilly areas enhance more erosion and run off conditions. There are many vulnerable points along the riverbanks of the major rivers of Manipur Valley, which get breached every year during rainy season. In these areas; erosion, sliding and slumping of the banks are common.

Table No 3.

Major Floods in Barak Rivers Basins 1990-2015

Date and Year	Remarks
First Week of August 2015	The state has witnessed moderate to heavy rainfall in the first week of August 2015, with several rivers flowing above the danger mark. The flood washed away bridges and national highways besides rendering thousands of people homeless in Manipur. Low-lying areas. The flood also inundated the capital city of Imphal and its outskirts.
August 2002	Severe flood occurred in Manipur valley in August 2002. Breach of embankment took place at 59 places. Due to incessant rain in the catchments, all the rivers flowing in and around Imphal, Thoubal and Bishnupur districts were rising from August 11, 2002. On August 13, 2002, the water levels in all major rivers/streams in Manipur valley were rising alarmingly crossing the R.F.L on the same day. The flood mainly occurred in the south eastern parts of Manipur valley. About 10,000 houses and 20,000 hectares of paddy fields were affected.
June- July 2001	Flood of low magnitude occurred in some parts of Manipur Valley. On 7th June breach of embankment of Nambol River took place at Nambol, Kongkham: inundating Kongkham, Sabal Leikai, Maibam and Naorem.

September 2000	Flood occurred in Manipur Valley in September 2000. Breaches of river embankment take place at 30 different places. Not less than 2,400 houses and 7,800 hectares of paddy field were affected. Breaches of river embankment take place at 11 places of Thoubal River, 6 places of Wangjing River, 2 places of Arong River, 2 places of Sekmai River and 3 places of Manipur River. The flood was of moderate magnitude.
September 1999	There was incessant rainfall from 24th August to 3rd September 1999. The flood mainly affected the southern parts of the Valley. Not less than 7,300 houses and 15,300 hectares of paddy fields were affected.
July, August 1998	Flood occurred in the Valley in July 1998 affecting some areas of Iroisemba. In August, breach of river embankment took place at one place of Wangjing River, as a result inundating the areas of Lamding Nashikhong, Lamding Laishram Leikai and some adjoining areas.
September 1997	Flood occurred in Manipur Valley in September 1997. All the rivers flowing through Manipur Valley were rising rapidly from 25th September 1997. Breaches of embankments took place at four different places of Nambul River, two places of Wangjing River, one place of Merakhong River, two places of Imphal River, two places of Thongjaorok River, one place of Khujairok River and one place of Khabi River. Due to the flood, damage caused to houses rose up to 4965 numbers. The flood was of high magnitude.
October 1992	Due to the incessant rainfall in the upper catchment area of the major rivers of Manipur Valley, water level of all the rivers rose rapidly. The daily precipitation in the form of rainfall on 14th, 15th and 16th October 1992 was very high and heavy discharge occurred in the rivers and caused breached, overtopping and piping at some of the places.

(Source: Manipur State Disaster Management Plan, Vol I and Reported by Earth Sciences Department, Manipur University, Canchipur, Imphal)

Table No.4
Frequency of Rainfall

Year	Brahamputra River Basin		Barak River Basin	
	Excess	Deficient	Excess	Deficient
1901–1910	1	0	2	0
1911–1920	1	1	1	1
1921–1930	2	1	2	0
1931–1940	3	2	1	0
1941–1950	1	0	3	1
1951–1960	1	0	0	2
1961–1970	1	3	0	4
1971–1980	1	2	2	1
1981–1990	4	0	3	1
1991–2000	0	4	1	0
2001–2010	1	4	0	5

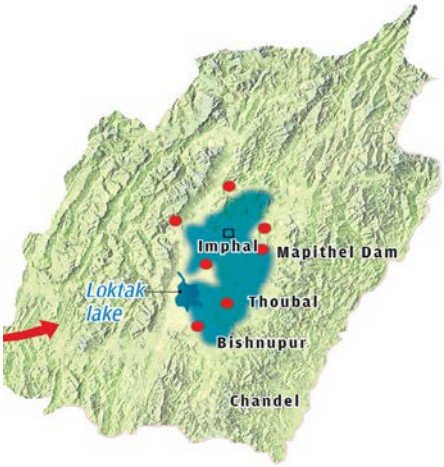
Source: R. L. Deka & C. Mahanta & H. Pathak & K. K. Nath & S. Das, Theor Appl Climatol (2013) 114:61–71

All the major river systems in the State are vulnerable to flooding, as captured in the Vulnerability Atlas[23] (Refer Map No.4). The high stream velocity of the Thoubal river causes breaching of river banks

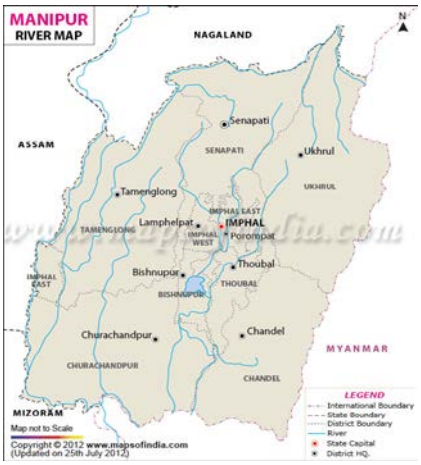
[23] Ibid.

at Okram, Sabaltongba, Khekman, Ningombam, Leishangthem, Phoudel and Haokha.[24] The confluence of the Imphal river with the Iril river at Lilong, makes it voluminous and rapid, causing the breach of embankment in Chajing, Haoreibi, Samurou and Lilong[25]. Khuga River flows through strong to steep slope. Hence river velocity is moderate to high, creating flood problem in Kumbi and Ithai Village. The Chakpi River meets the Manipur river at a reverse direction causing flood in surrounding areas of Sugnu extending up to Wangoo, during rainy season. Most of the embankments are poorly maintained. Many vulnerable points in Imphal river Thoubal river and Iril river were identified for prone to flooding due to river channel encroachment. The rapid increase in the valley's built- up areas is also an important factor for the recent increase in flash floods in urban areas.

Map No 3
Manipur State – Relative Relief



Map No 4
Manipur State- River System and Network



Source: Down to Earth – August 2015 and Manipur State Disaster Management Authority

In addition to meteorological factors like; the intensity and amount of rainfall and other forms of precipitation, during specific period, flood vulnerability is affected by the structural and non structural parameters like;

Structural and non structural measures include;

- Structural design and maintenance of, embankments/banks, flood walls, flood levees,

[24] Manipur State Disaster Management Plan, Vol I and Reported by Earth Sciences Department, Manipur University, Canchipur, Imphal

[25] Manipur State Disaster Management Plan, Vol I and Reported by Earth Sciences Department, Manipur University, Canchipur, Imphal

- Channel improvement desilting/dredging of rivers, dams, reservoirs and other water storages,
- Drainage improvement, diversion of flood water, catchment area treatment/afforestation, anti-erosion works,
- Alignment, location, design and provision of waterway i.e. vents, culverts, bridges and causeways in national highways, state highways, district and other roads and
- Railways embankments and inspection, rehabilitation and maintenance
- River channels should be free from encroachments.

River flooding is a regular hazard faced by the State, but it has usually manifested into disaster during last few years, due to drainage failures in urban areas, increased run-off loads in hard surfaces, due to large scale deforestation causing increasing erosion capacity of flowing water, illegal encroachment of river channels and engineering defective construction of dams and bridges, creating barriers in the free flow of excessive water during heavy rainfall in catchment areas. Other identified causes of floods in Manipur valley, includes poor urban drainage, deforestation, breaching of river banks, improper damming and their poor maintenance, sediment pollution, siltation, shallowing of river beds and lakes, changing of land-use pattern, vanishing of traditional recharging structures and water bodies. Earlier various lakes of Manipur, mostly located in the southern part of the valley, served as effective reservoirs of excess runoff. Most of the lakes are severely degraded in quality to the extent of complete disappearance resulting in severe curtailment of their water holding capacities.

Manipur State Flood Disaster 2015

Manipur witnessed worst ever floods in July- August 2015, as large area in Imphal, Thoubal, and Chandel districts were inundated for nearly 10-15 days due to heavy rainfall from 29th July to 2nd August 2015. According to GIS map a large area of Imphal, Thoubal and Chandel districts were inundated for near 15-20 days. (Refer Map No.3 Inundated area due to floods in 2015)

Surprisingly neither the national media nor state media reported the worst flood that affected entire Thoubal district and parts of Chandel district according to affected people. This is said to be the worst flood in last 200 years. The Asian Highway No 1, connecting Imphal and Moreh- Mayanmar was affected and remained cut off for nearly 10-15 days. The old bridge at Pallel was damaged and the lone and newly constructed Pallel Bridge, yet to open had been affected. Chakpi River in southern Chandel district washed away the lone Chapikarong bridge. The Chakpi River flooded the entire

Serou region in southern part of Thoubal district. The worse affected areas in Thoubal district were Kakching sub-divisional areas, Wabagai-Hiyangalam and Sugnu and Serou area in Thoubal district. According to the government reports nearly 600 square kilometers of area with over 500,000 populations were affected in the Thoubal and Chandel districts[26].

Majority of the population in the flood affected area are farmers, whose paddy crop cultivation was destroyed and it also affected crop production for the next year, due to acute shortage of seeds. Fisheries farms got submerged and people lost livelihood, as animals, poultry and piggery in domestic homes are the sole source of livelihood for most of the villagers, which were also destroyed. The market and shops were closed and many were submerged at least for one week. Since it was the season for agricultural plantation, the farmers had suffered food security for the entire season. The inundated area of Manipur in 2015 floods is also known as the rice bowl of Manipur that produce large quantity of agricultural products, not only for the region but also for the entire state. Hence floods in 2015 created food scarcity condition for the state.

Failure to adhere to the basic tenants of both structural and non-structural measures mentioned above attributed to the floods of July- August 2015 in Manipur State. The observations from the field visits and discussions with flood victims brought out the following major reason for flood devastation of July- August 2015, which could have been avoided, if appropriate measures and steps were taken by government, community and state disaster management authorities

Flood July- August 2015 in Manipur Valley

[26] Discussion with the District Authorities held during field visit.

Major Causes of Flood Disaster in Manipur

Inadequate Carrying Capacity of Rivers due to illegal encroachment of river channels

All the major rivers of Manipur state after the confluence of the rivers from hilly areas meeting in the plain areas have inadequate carrying capacity in the plain areas. The capacity of the river channels in the plain areas has been reduced further from its original capacity owing to illegal encroachment of land for commercial agricultural activities (banana cultivation- See photograph taken during the field visit), construction of illegal buildings on the edge of river channels and continuous siltation of these rivers, raising the water levels of rivers. After the discussion with community and government staff, it was observed that de-siltation of river channels and maintenance of embankments has not been undertaken for a long time in Manipur. Instead community members have been allowed to encroach the river channels for commercial agricultural activities. These agricultural activities have created barriers in the free flow of water, during heavy rainfall season. All the three major rivers in Manipur proved insufficient to accommodate the enormous discharge of floodwater in July- August 2015. The floodwaters of such enormous volume led to the inundation of plain areas of Thoubal and Chandel districts in Manipur, due to breaches in the embankments as well as damming conditions created by land encroachments and defective engineering structures.

Heavy discharge of water from dams constructed in and around the Manipur valley, due to poor maintenance and leakage from Dams were also mentioned as a major cause of flooding during the periods of July- August 2015. Maintenance of dams and regular maintenance of embankments/ banks/ river walls has been ignored since a long time in the state. Discharge from these dams and tributaries of the major river systems of Manipur state simultaneously brought down water with enormous force and high speed in the river channels. This made it difficult to manage the floodwater.

Encroachment of River Channel for commercial agriculture(Thoubal River)

Banana Cultivation in the river channels of Thoubal River

Photographs taken on 10th April 2016 by Research Team of DRP-JN
Defective Structural Design of the Old Bridge at Rungchang Chakpikarong village in Chandel district

Due to continuous rainfall for four days in the higher catchment area of surrounding mountain hills of Chakpikarong village, huge trees and wooden logs were brought down by the river Chapki from higher reaches. These trees, eroded soil and wooden logs brought down by the river Chapki was blocked at the old bridge of Chapki river due to defective structural design of the bridge (like; huge and wide pillars closely spaced). This blockade created conducive damming condition. According to the flood victims the new bridge was constructed 5 years earlier at the same point but due to state governments lethargy, the old bridge was not dismantled, in spite of several repeated requests from the community. (Refer Photographs below)

Old bridge and New bridge standing side by side for last 5 years with no purpose

Structural Design defect of Old bridge created Dam Conditions during July- August Floods 2015

Owing to the poor maintenance of embankments, flood walls and flood levees of old bridge, the Chapki river was blocked at the old bridge for several days This stopped the free flow of water through old bridge and water started rising backwards, flowing over the water channels and inundating village Rungchang and other adjacent villages. Since the village is flat surfaced, thus the flood water inundated many villages downstream for 10-15 days. All the low lying areas were completely inundated. People were vociferously of the opinion that due to negligence of the government in demolishing the old bridge on Chakpi river, where new bridge had been already constructed, had caused floods of 2015 in the village and its surrounding areas

Unabated urban expansion

Imphal city has been expanding fast, converting many wetlands and water bodies into dwelling units. In this process of expansion, even the flood spill channels have been encroached upon and residential colonies have come up closer to water bodies. During the floods of July- August 2015, these areas were the worst affected. Floodwaters followed the natural path and inundated whatever came in their way.

Excessive and unabated deforestation in the Manipur Hills and its tributary basin

During last three decades, Manipur has been denuded from forest cover by human intervention on a large scale. Forest rights given to the tribals have often been misused for commercial felling of trees. The excessive deforestation in the hills and its tributary river basins has increased

erosive capacity of rivers and increased siltation in river channels and water bodies, thereby increasing water levels in these river channels and water bodies. Unfortunately, no efforts were made towards channel improvement, desilting / dredging of rivers and other water bodies like; wetlands, lakes, etc;

Disaster Management and Risk Reduction Policy

Sendai Framework of Action has rightly endorsed Disaster risk-reduction management (DRM) through community resilience measures as a key to reduce the disaster related affects. DRM is therefore the key to minimize the human fatalities, loss of building and other construction and infrastructure structures, agricultural crops, loss of animal and livestock. Mainstreaming disaster risk-reduction management within the policies and programmes of different sectors ensures that the effects of disasters are minimized. At the same time, it enables governments to ensure that these policies and programmes do not put people at risk. According to the UNISDR- 2009, DRM is

"the systematic process of using administrative directives, organizations and operational skills and capacities to implement strategies, policies and improved coping capacities in order to lessen the adverse impacts of hazards and the possibility of disaster

"People are already experiencing the impacts of climate change through slow onset changes, for example sea level rise and greater variability in the seasonality of rainfall, and through extreme weather events, particularly extremes of heat, rainfall and coastal storm surges".[27] At the same time, economic damage from climate-related extreme events and disasters has increased dramatically in the last 50 years, with developing country economies being particularly badly hit.[28] There has been significant rise in economic losses from disasters for the Asia and Pacific region.[29]

While it is clear that climate- and disaster-related shocks and stresses undermine economic growth and development, there are many actions that governments and other agencies can take to reduce the risks to lives,

[27] IPCC (2012) 'Summary for policymakers. Managing the risks of extreme events and disasters to advance climate change adaptation', in C.B. Field, V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor and P.M. Midgley (eds) Special report of Working Groups I and II of the Intergovernmental Panel on Climate Change. Cambridge, UK, and New York: Cambridge University Press (www.ipcc-wg2.gov/SREX/images/uploads/SREX-SPMbrochure_FINAL.pdf)

[28] Ibid, pp, 7

[29] Ibid, pp, 7 and UNESCAPUNISDR (2012) Report.

livelihoods and economies.[30] Poor people suffer the most from disasters, as they lack the capacity and resources to effectively cope with disasters. Risk management in policies and programmes, to reduce disaster risk reduction is vital for helping to ensure that the most vulnerable people can access the benefits of development.[31] Some people see mainstreaming as a way to realize certain human rights, including the right to safety.[32] The impetus for mainstreaming risk in development can also be linked to a government's fiduciary responsibility; Jackson makes this point when he notes that mainstreaming risk is a government's "duty to their citizens to maximise the utility of the public resources disposable to them, similar to a private company's fiduciary duty to maximise value to shareholders".[33]

Floods being the most common natural disaster, people have, out of experience, devised many ways of coping with them. On account of frequent occurrence of floods since times immemorial, people have learnt to live with them. They have generally set up settlements away from frequently flooded areas, which have been used for other activities such as agriculture, grazing of cattle etc. The crops that can sustain submergence are grown in the flood prone areas, during rainy season. However, encroachments into the flood plains over the years have aggravated the flood problem and a need to take effective and sustained flood management (FM) measures has been felt. FM measures include both structural and nonstructural. If these FM are in place a considerable protection towards DRM can be ensured for the protection from human fatalities, loss of building and other construction and infrastructure structures, agricultural crops, loss of animal and livestock.

The assumption that it is more expensive to invest in disaster-resilient development, such as drought-resistant crops and flood proofed roads, disaster resilient shelters has not been corroborated with evidences. In fact a cost-benefit analysis for the housing sector shows, this is not always the case. The cost of building homes that can withstand floods is far lower than the cost of repairing homes that cannot stand when a flood does hit. Results have shown that costs of building flood resilient structures, houses and

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30 Ibid, pp 54

31 Mitchell, T. and Tanner, T. (2006) Overcoming the barriers: mainstreaming climate change adaptation in developing countries. London: Tearfund.

32 Kent, G. (2001) 'The human right to disaster mitigation and relief', Environmental Hazards 3(3): 137–138; Khan, D. (2013) 'Opinion: integrating climate-smart DRM in key sectors – what does it take?'. London: Climate and Development Knowledge Network (http://cdkn.org/2013/06/opinion-integrating-climate-smart-drm-in-key-sectors-what-does-it-take); Bahadur, A. (2008) Accountability for DRR. IDS Research Report for Christian Aid. Brighton: Institute for Development Studies.

33 Jackson, D. (2011) Effective financial mechanisms at the national and local level for disaster risk reduction. Geneva: United Nations Office for Disaster Risk Reduction (www.unisdr.org/files/18197_202jackson.financialmechanismstosup.pdf).

cultivating flood resilient agricultural crops can be minimized with use of modern technology.

Flood Disaster Management in Manipur: Preparedness, Response, Damage Assessment and Rehabilitation: Sample Survey Results

Manipur state has long history of flood management strategies through local traditions like widening of river channels and clearing river channels from wastes but such measures have been stopped by the community to increase incomes through illegal encroachments of river channels.

Although Manipur state had a historical record of flood management, yet surprisingly the state has remained a blind spot, in both the Central Water Commission and Indian Meteorological Department's monitoring and flood forecasting establishments. The Central Water Commission (CWC), India's premier water resources body that is responsible for flood forecasts and related advisories to states, had no forecast for any place in Manipur during July- August 2015 floods. This was despite the fact that the India Meteorological Department website clearly indicated heavy rainfall in the state.[34] Unfortunately the subject of flood control, unlike irrigation, does not figure as such in any of the three legislative lists included in the Constitution of India. The primary responsibility for flood control thus lies with the states.

The flood disaster management policy of Manipur is completely dependent on Central government. Manipur State Disaster Management Authority (SDMA) is still in its infancy stage Unfortunately the provisions of Disaster Management Act 2005 and Disaster Management Policy 2009 have not made progress in the state. The preparedness, response and recovery and rehabilitation to July-August 2015 flood disaster, indicated that no efforts have been made to institutionalize Disaster Risk Reduction into governance, as envisaged in Disaster Management Act, 2005 and National Disaster Management Policy, 2009. Disaster Risk Reduction (DRR) has not been mainstreamed into development planning to build capacities and promote effective institutional mechanism and promote community based DRR. Even the research has not been promoted for an effective, well coordinated and timely preparedness and responsive system.

The State government and administration was caught unawares and once Manipur valley was flooded during July-August 2015, the State machinery officials, police and military were paralyzed. Flood victims could not be rescued for nearly a week nor could they be provided with any relief

[34] https://sandrp.wordpress.com/2013/06/25/central-water-commissions-flood-forecasting-pathetic-performance-in-uttarkhand-disaster/

material like drinking water, food, clothes, and medicines- all basic essential requirements for life. The state government and SDMA made no efforts to requisition boats, life jackets for rescue of marooned victims. Moreh, a town on the India-Myanmar border, and Jiribam were completely cut off from the rest of the state due to landslides caused by flash floods triggered by the heavy downpour. Normal vehicular movement along the Imphal-Jiribam section of NH-37 had been disturbed after damages were caused to a bridge on Barak river. Since the area was cut off from rest of the Manipur valley, the community had to depend on local support without food supplies and essential subsistence requirements. Animals of the village were wiped out and food scarcity was common feature for many months.

Detailed discussion was held with Manipur State Disaster Management Authority (SDMA) and district administration of Thoubal and Chandel districts, to understand the steps and efforts made for the flood disaster preparedness and management. Present preparedness of the SDMA has been assessed after seeking key information from the authorities.

A sample survey of flood victim respondents was conducted to assess the preparedness, response, damage assessment and rehabilitation measures undertaken by state government authorities, community and civil society organizations. Vanzing Tentha village in Thoubal District and Rungchang Chakpikarong village in Chandel district were selected for the survey. These two villages were flooded during July- August 2015. (Refer Annexure-II) .

Table No 5 depicts the characteristics of respondents selected for the survey. The survey was conducted among 20 male and 10 female respondents. These respondents represented diverse age and occupation groups.

Table No 6 depicts the perception and preparedness of disaster management among the community after the 2015 flood disaster.

Table No 5

Sample Survey Respondent Characteristics

Areas/ Localities	Sex		Age Group			Occupation		
	Male	Female	< 20	20-40	40 +	Service	Trade	Agri
Thoubal District	10	5	1	8	6	3	2	10
Chandel District	10	5	1	7	7	2	5	8
All Areas	**20**	**10**	**2**	**15**	**13**	**5**	**7**	**18**

Source: Field Survey by Research Team at Thoubal and Chandel District of Manipur April – June 2016

Key Findings

Field observation at the survey site clearly reflected that Thoubal River has been encroached by villagers for banana cultivation which has hindered the free flow of discharge of rain water. Discharge from dams located in the Manipur valley due to structural defects also released water in the rivers in plain areas. Village Chakpikarong located at the foothill of the surrounding mountain ranges had never witnessed flooding in the past memory of the people. In fact, the village is located at higher elevation and is not prone to flooding. The village was flooded on 29th July 2015 midnight. The water entered the village from western side and on 30th July havoc was in store for the village. It rained continuously for 4 days. Debris brought down by the river from higher reaches (tree trunks, stones, boulders, mud and branches of tree) was blocked at Chapki old bridge creating damming condition. These manmade barriers in the river channel hindered the free flow of excessive water supply in the river because of continuous rainfall during July- August 2015 flooding. Unfortunately, neither government nor community has learnt any lessons from the past floods.

Field observations and information collected in both village of Chakpikarong, District Chandel and village Vanzing Tanthi of Thoubal district are tabulated (Refer Table No 8) [35] . Major key findings from the study as stated by the respondents and based on field observations are as follows:

- There was no early warning by government, regarding the floods. For one week, the inundated areas remained cut off. There was no disaster preparedness for the floods of July- August 2015 in Thoubal and Chandel districts. The government was totally unprepared to face such disaster.
- Major cause of sudden flooding disaster of large areas in the plains of Manipur state was due to manmade actions like deforestation, encroachment of land for cultivation and other buildings in the existing river channels and defective construction practices of dams and bridges without any maintenance services. These human activities created artificial barriers in the way of free flow of river water.
- Government response to rescue people, affected by floods was slow and weak. Communities, local civil societies and local clubs were more responsive to help people immediately after the flood disaster. People with support from local communities shifted to more secure areas and some food was made available to them. Immediate relief in terms of makeshift shelter,

[35] Detailed discussion was held with Mr.N.L. wangam (aged 75 years), Village head, Mr. H.B. chumvol (aged 51 yesrs), Village Authority member and group discussion with villagers and in particular with Women Groups.

food, drinking water, and clothing were slow from government authorities. In the 'relief camps' people had nothing to sleep on except for a piece of cloth and men and women, boys and girls all cramped together.

- The roads damaged during 2015 floods were yet to be repaired completely. In fact government's pathetic actions towards stopping land encroachment in the river channels were a measure causes for sudden inundation of areas in both districts. In spite of community appeals to demolish the old bridge on river Chapki, no action was taken by government until our field visit. This manmade disaster in the village inundated the area for 10 days, forcing people to move to higher reaches and live in makeshift and tented accommodations.

(Refer Photographs below depicting poor maintenance and engineering structural defects, Photographs show that debris brought down by river was blocked by the old bridge, creating dam. The debris was still not cleared even after 9 months. Villager fear that this might be another alarm for flood in 2016, if the old bridge is not demolished)

Photograph taken by Research Team 10th April 2016

- Response from government was weak, even after one month of the floods, inundating large habitable settlements. Community lost complete agricultural season without any agricultural activity, the main source of their livelihood for the whole agricultural season. Little support from NGO's and Government in terms for food, lead to a situation of borrowing of money from money lenders at annual interest rate of 24%, to sustain their basic livelihood levels and basic food security requirements. The borrowed money

along with high interest rates are pushing them into vicious circle of poverty. Angry locals have alleged that the state government has not done enough to help those affected by the floods in interns of quick response, relief and rehabilitation.

- The floods affected the subsistence and basic livelihood opportunities of affected people as growing agricultural season was disturbed due to water logging and sediments in the fields even during next agricultural season. Community stated, that the cascading effects of borrowing money from money lenders at high interest rates, still continue and government rehabilitation package is still awaited. People have to repay their loans with high interest rates.
- Government support in terms of MGNERGA, food security scheme and IYA has been very slow due to weak response of conducting survey for the identification of victim's property, animal and agricultural losses. Even after nearly one year no major rehabilitation package has been given to affected people.
- The government has not even identified any emergency operation sites for safety in case of emergency situation in the current year or in future years.
- However, people felt that they were better prepared to face any eventuality as there is a strong sense of solidarity among the community with support from civil society organizations.

Field visit observations and discussion with flood victims in the selected villages conducted on 10th April 2016 was conveyed to the State Disaster Management Authority for necessary steps to be taken to avoid any such eventuality of flood disaster in the year 2016. District authorities were requested to demolish the old bridge immediately as the villagers were firmly of the opinion that another disaster is waiting in 2016, if the bridge is not demolished and the existing dams repaired and maintenance of the dams ensured. It is heartening to note that the old bridge has been demolished at our suggestion giving a much needed relief to the inhabitants of the village. (Refer Photographs below).

Another recommendation of the visiting team was to distribute the relief funds to the victims immediately, so that the loan drawn at a high interest rate by the victims could be returned back to save them from the vicious circle of poverty. Orders have been issued for the release of the relief fund.

Photograph of Demolished Chapki Bridge (Photographed on 25th June 2016)

Table No 6

Surveyed Respondents in Thoubal and Chandel District

Perception of Preparedness of Disaster Management(Percentage)

Area/ Locality	**July- August 2015 Percentage**	**Present Time Percenatge**
Installed Early Warning System	No Idea 100%	No Idea 100%
Appropriate Awareness created about flood eventually by Government	Yes 5%	Yes 30%
Awareness about flood eventually by Civil Society/ NGOS	Yes 20%	Yes 60 %
Awareness through mock drills by Government	Yes 5%	Yes 15%
Knowledge of Rules and Regulations in place like not to construct around river channels/ flood channels	Yes 10%	Yes 35%
Implementation status of such rules	Yes 5%	Yes 25%
Knowledge of de-silting and drudging activities of government for river channels/ flood spill channels	No 5%	No 15%
Implementation of de-silting and drudging activities of government for river channels/ flood spill channels	Yes 5%	Yes 15%
Your perception on implementation of rules and regulations for the removal of unauthorized and illegal constructions around river channels/ flood channels	Good 5%	Good 15%
Do you have any knowledge of any safety audits in place by government to avoid flooding in the flood prone areas	No Idea 100%	No Idea 85%
Did you observe or have knowledge of steps taken by government to strengthen flood protection walls/ strengthen bunds Yes / No	No Idea 90%	No Idea 80%
If yes how would you rate its implementation		
Do you have/ had any knowledge that government has identified Emergency Operation Services or safe areas of evacuations in case of emergency at the time of disasters	No Idea 100%	No Idea 85%
How would you rate the overall preparedness of Government to face any such eventuality in future	Good 5%	Good 10%
How would you rate the overall preparedness of community themselves to face any such eventuality in future	Good 10%	Good 80 %

Source: Field Survey by Research Team at Thoubal and Chandel District of Manipur April – June 2016

Recommendations

- Strengthening the flood infrastructure in the Barak Basin to cope up with the probability of next extreme flooding event of the magnitude observed in 2015. This includes the preparation of an integrated DPR for the construction of the alternate flood channel for increasing the carrying capacity of the main tributary rivers with main rivers in the plain areas of Manipur.
- Dredging of the existing river channels, flood channels, wetlands and strengthening of breached and weak embankments. Encroachments in the river channels by community for commercial agricultural must be stopped and the river channels must be freed from such obstructions. Proper maintenance of these riverbanks is very much necessary and retaining walls needs to be constructed to reduce the flooding conditions.
- The management of the water bodies/lakes and wetlands in the Barak river Basin should be brought under one regulatory authority for their integrated management.
- The government, with the help of academia/research institutes, must consider undertaking a scoping study to assess the probability of flooding in immediate future, based on the understanding to be developed from the interactions of ground water, surface water and the landslide prone areas in the Barak river basin.
- SDMA and district authorities must urgently operationalize, the Flood Early Warning System (FEWS) for Barak River Basin.
- The State Government must initiate on priority (with the help of leading academic institutions), to undertake transparent flood zonation and flood vulnerability assessments of people and places at village level, so that the flood risk reduction is integrated with developmental planning at village level in all District Development Plans.
- Knowledge driven all-inclusive multidisciplinary flood planning needs to be initiated on priority by engaging technocrats with relevant expertise, to develop insights into flooding mechanisms in the Barak river basin, building on comprehensive existing studies.
- NGOs and CBOs and local communities must be encouraged to launch awareness generation campaigns on Disaster Management and risk-reduction measures converging both local and traditional knowledge with modern scientific knowledge. Effective support from SDMA and academia must be strengthened for these trainings. Such awareness should be generated and demonstrated with the help of local folk theatre, integrating the art with the theme of disaster risk reduction. Regular awareness campaign should be encouraged regarding safety measures against potential hazards using students body from schools and institutes of higher educations,

media, campaigns, development and distribution of leaflet, posters, meetings, workshop on priority basis.

- SDMA should formulate literature of do's and don'ts for building codes and disaster related rescue in local /vernacular languages with help from experts and educate public in basic response measures. There should be networking with community and the concerned authority to share knowledge and best practices on anticipated hazards with accuracy and effective approach.
- Municipalities and Panchayati Raj Institutions, Autonomous District Councils, Community Based Organizations and people (youth and school children) should be empowered and strengthened to undertake and monitor the time bound implementation, accountability and transparency of sanctioned projects.
- A convergence of welfare programmes and greater accountability of implementing departments would improve performance and participation of all stakeholders during disasters by generating a sense of belongingness and ownership amongst people.
- Training has been found to be the most effective tool of reducing vulnerabilities. Municipalities and Panchayati Raj Institutions, Autonomous District Councils, Community Based Organizations should ensure capacity building of the officers, employees and other staff, so that they are well trained for quick management of disasters and carry out relief, rehabilitation and reconstruction activities in the affected areas.
- The "belief" that upper reaches of Manipur cannot live without supplies from outside was clearly found during the floods 2015. Thus efforts should be made to provide supplies by helicopter services in the cut off areas during such disasters.
- The state of Manipur requires an urgent need for developing disaster resilient afforestation and reforestation measures.
- Synergy should be created with the Central and State government poverty alleviation, infrastructure development and livelihood generation programmes to enhance adaptive and coping capacity of people through skill development and capacity building for local resources management.
- Emergency Operation Site (EOS) should be identified based after identifying disaster vulnerability sites for future eventuality, and these sites should be fully prepared with all multipurpose emergency services like appropriate shelters, medical support, drinking water and appropriate bedding and food.
- Immediate relief and rehabilitation should be distributed to the identified victims after survey, so that victims do not fall in the vicious circle of borrowing loan at at interest rates and eventually fall within the vicious circle of poverty.

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