CHAPTER II

REVIEW OF LITERATURE

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2.1 Review:

Flood and its management broadly cover two related measures i.e. structural and non – structyral.Structural measures: Any physical construction to reduce or avoid possible impacts of hazards, or application of engineering techniques to achieve hazard-resistance and resilience in structures or systems; Non-structural measures: Any measure not involving physical construction that uses knowledge, practice or agreement to reduce risks and impacts, in particular through policies and laws, public awareness raising, training and education. Social Work is an emerging profession directed towards promoting development of community in order to enable people , especially those belonging to weaker and vulnerable sections of society, to lead a structured, managed, dignified and peaceful life.

The literature on community based flood management and research base reveals that there should be given enough focus and attention in the area of research along with theory and practice. The term 'Social Work', the suffix of 'Work' makes it obligatory for the profession to concentrate its attention mainly on practice which has to be done with the people or issuses pertaining to community to evolve and desigh the innovative ideas of community which are either in hidden form or inborn. The use of community coping mechanisms in flood management in Assam has been proved to be innovative practice which not only reduce the dependency of community to rely on Government agencies for flood relief but it has given a wonderful tool for flood management which rather we say more effective and practical than Incident Command System (ICS) or Incident Response System (IRS). The researcher by virtue of the experience gained in this field collected the data which are in-depth in nature. CBFM is a unique approach which has very few literature available. A large number of research studies have conducted to assess the impact of CBFM. This study mainly covered CBFM , its impact, coping mechanisms, awareness of community people about government policies and programmes on flood management, role of PRIs and NGOs and suggestions along with social work intervention to make the community coping mechanisms more useful, shapefu, structuered and professionally manageable.

MacMillan and Chevis (1986) opined that the definition of community varies based on its perspective. Many people describe community in different ways. described community as "a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together". This definition is preferred in the current context because of its general nature. Community includes not only the people living in a certain location, but also incorporates the local government, local management issuses, local academic bodies,locally developed coping strategies to deal with emergencies and non-government organizations.

Maskrey (1989) has rightly pointed out that, disaster management should not be treated as one single issue but should be incorporated into the socioeconomic activities of local people. The rationale for community involvement or community-based activities is now well rehearsed.

Maskrey, et al (1989) again pointed out that 'top-down' programmes in which communities are not involved tend not to reach those worst affected by disaster, and may even make them more vulnerable. This is found to be similar in both developing and developed countries.

Newburn, (1993) is of the view that Social Workers' skills in communication, networking for community planning, stress management and therapeutic listening are key in both immediate and longer term responses to disasters.

de Garine,I, (1993) highlighted that A community-based risk assessment is a simple method to assess risk and to design community level fl ash fl ood risk management plans. It has a low level of accuracy because the information collected is subjective and tends to be more qualitative. For example, community members may not remember events accurately, especially those that happened long ago. But, in spite of all the constraints, community resources cannot be underestimated. Participation is the key to conducting a successful community-based risk assessment. The opinions, knowledge, and experience of the community can be tapped by establishing.

M.R.Khanal & N. Thapa (1993) stressed on the point that, It is interesting to note that, living within the marooned homestead is predominantly a family-level response, while opting for relocating temporarily in a flood shelter is a community

level response. However, opting to relocate to a neighbour's or a kin's house is again a family-level response measure during a flood. This is simply impossible by any relief or disaster management agency to understand and safe the life of someone who has specific needs and is vulnerable to flood or anyb disaster . Shift, if possible, children (below 10 years of age), the old (above 60), adolescent girls, pregnant women, and lactating mother(s) in safer places (flood shelters, floodfree kin's house etc.) can only be done by the community people and not any agency . Mark safest escape routes by hanging coloured signs hanging on tress (to facilitate quick and safe relocation) Build a makeshift high platform (within the house) and put perishable belongings there to avoid submergence. Protect the house from being eroded by wave activity by creating aprotection belt (use bamboo sticks/jute sticks etc.). Food and drinking water storage and handlingSafeguard perishable food items, cooking fuel, and valuables from submergence (placing those on elevated platforms/hanging from the roof)Collect tubewell water. If non-contaminated water is not available, purify water before drinking .Collect locally available varieties of spinach and vegetables and take them in addition to dal-bhat . Use pre-processed dry food and take sufficient amount of water in order to avoid dehydration can only be done effectively through community based flood management approach.

Banerjee and Gillespie, (1994) pointed out that , over the years, many authors have called for more coordinated community emergency planning to mitigate against the devastating humanitarian catastrophe that can follow naturally occurring disasters like floods, hurricanes, and earthquakes.

Blaikie et al., (1994) is of the view that , increasing numbers of flood disasters are reported in the low lying region, which cause significant financial losses, due to concentration of assets in the flood plains. Thus, not only the life loss, floods have become the most costly natural disasters worldwide. The community is first victim and responder too.

Blaikie et.al (1994) Quarantelli (1989), Mileti (2001) are of the view that, for many countries in the developing world, flood bring new opportunities of livelihoods, e.g., flood water brings fishes to fisherman, brings new fertile soil for agriculture. Therefore, while it is important to reduce the negative impacts of flood, the positive aspects of flood have urged people and communities. As more research

on development are conducted in various fields in recent years, the applying that approach to disaster mitigation is becoming more and more community-based.

Das , H.N, (1994) expressed his ideas by saying that the the Government has already established a Flood Forecasting and Warning Center. However, due to weaknesses in the dissemination system, the information does not reach the beneficiaries.The current forecasting mechanism cannot meet the needs of the rural communities for flood-related information. The warning is usually disseminated only through Radio, TV, local news paper which is not even accessible to most urban areas Communities must find ways to have access to forecasts and disseminate the information in a user-friendly manner, such as utilizing local volunteers who would disseminate information by using megaphone or public microphones (as used in mosques/ temples).

Zakour(1996) A review of social work literature showed that social work intervention focused on individuals, families, organisations and communities. Areas of concern for social work have include traumatic stress, resources for disadvantaged and vulnerable population and coordination of various intervention systems/ relief efforts.

Buckland J and M rahman(1996) highlighted that the vulnerable areas to develop the notion "living with flood" or "coping with flood". Participatory flood management with both hard and soft measures is becoming the key focus area.

Dayal , Zachaiah & Rajpal (1996) expressed that the livestock and poultry management including livestock feed are not taken care by relief agencies during the time of flood. Communities safeguard livestock and poultry from submergence nad thus community based approach is very effective to managements rather than focusing on relief agencies.

Mermelstein (1996) and Morrow and Peacock, (1997) analysed the association between community characteristics before a flood and the survival or failure after flood of eight communities that experienced the Midwestern flood of 1993 in the USA. They found that high poverty rates in communities were associated with the failure to survive.

Bangladesh Red Crescent Society(BDRCS)(1997) highlighted that, A community can help restoration of (a) houses, (b) sanitation facilities in each household, (c) water supply facilities at community levels, (d) commuter roads/ bridges/culverts/electric connections, (e) educational activities, and (f) health care facilities.

Hewith, Paul (1997) has elaborately described that the traditional approaches to flood control have relied on structural works, including building dykes, floodwalls and levees or modifying river channels (e.g. widening, lining with concrete, or straightening by cutting through channel meanders to shorten the flow distance). These structural approaches, however, have failed to reduce flooding or to reduce ever-increasing economic losses from floods, as economic losses are merely postponed and continue to rise.

Directory of Indian Agriculture, (1997) Directorate of Economics & Statistics,Ministry of Agriculture, government of India, New Delhi. It is a general feature in Assam that following a disaster all the information relating to people's individual and collective coping and adaptation is lost due to the inability to keep records and/or poor maintenance of records, but the coping strategies developed in Assam is an important instrument to deal with floods where the majority of decisions and actions relationg to minimize the efforts of floods is done by the community people.

Singh S K, (1998) is of the view that community preparatory methods that the most significant impact of flood damage and loss of potential can be made. Such preparations currently include basic research, development and implementation of building codes and other structural measures, land use zoning, the provision of information, disaster planning at the level of communities, insurance and rehabilitation planning and budgeting. Prospects for future may include some degree of prediction and control and thereby warnings.

Burby et al., (1998), highlighted the impact of flood on the human and animal habital. Prolonged stagnation of the flood and storm water not only affects people's lives, but causes damages to agriculture, and generates health problems due

contamination with the ground water and thus community based approach is inevitable .

Twigg and Bhatt, Shaw and Okazaki (1998), are of the view that much more effort has been put into incorporating disaster management aspects into the holistic development of communities only due the success of community based flood management approach. Thus Government is planning to incorporate Disaster Management Planning with Development Planning.

Singh and Kundu, (1998), has pointed out that the number of other preparedness activities is undertaken upon receipt of flood warning – formal and/or informal by each farming household/ Family in the community. Various other modes of preparedness. People of community form and activate a task force to maintain security of the flood shelter(s) and keep the peace, assess needs of the community member households and liaise with local government institutions and local administration for continued relief operation during and after the flood, create a healthy stock of packets/sachets of oral saline to meet the emergency during outbreaks of diarrhoeal diseases. In case of paucity of funds, oral saline are also be prepared at low cost.Through a participatory process (by engaging local school children),

Sinha P C, (1998), pointed out community based approaches to flood as Household and/or Family-level Activities focuses on Preparedness for floods and minimizing negative flood impacts by way of Elevate, where possible, the plinth (bhiti and/or bhita) of the homestead, Change, if possible, the weakened pillars/stilts, Raise, where possible, the level of plinth of the cattle-sheds, Collect pipes for tubewell and raise its level upon issuance of flood forecast. Prepare elevated stages to: (a) store food (preferably dry food such as dry-rice, molasses etc.), seeds and fuel (biomass), (b) keep fodder, and (c) store family assets and valuables. Take care of family boat(s), if any. Collect carbolic acid from a dispensary and place it around the house (inorder to avoid snake bite). Raise the level of sanitary latrine. If possible, connect the latrine with the raised house by a makeshift bridge. People Keep a few sachets/packets of oral saline, sugar & salt, water purifying tablets, emergency first aid material etc. in a basket hanging from the ceiling/roof.Preparedness for floods to make optimum use of floodwaters, Collect several stems of banana plant and make

raft(s). Prepare one removable earthen stove to face emergency.As indicated 'cage fish culture' and/or 'floating vegetable gardens'

Mileti, 1999, Musiake,(2003), highlighted that, embankments further complicate the situation by causing siltation of the river channel and the resultant lowering of its carrying capacity, drainage congestion and water-logging, as evidenced in the Brahmaputra river basin.

Twigg, (1999), pointed out that because community-based activities (and community-based organizations) are deeply rooted in the society and culture of an area, they enable people to express their real needs and priorities, allowing problems to be defined correctly and responsive measures to be designed and implemented.

Twigg and el al (1999 and 2000), also argues that existence of community-based organizations allow people to respond to emergencies rapidly, efficiently and fairly, and therefore available community resources (even it is small in amount) will be used economically.

Siromony, PMV,(2000), highlighted that most disaster management systems are fashioned using command and control management structures, one that is top-down and with logistics centered responses. It can be highly bureaucratic and frequently operates under explicit or implicit political constraints that impinge on the effective delivery of emergency services. Due to this, engagements of the community under this scheme were characterized by the following: a) lack of participation that results to failures in meeting the appropriate and vital humanitarian needs; b) unnecessary increase in requirement for external resources; and c) general dissatisfaction over performance despite the use of exceptional management measures.

Ghosh G.K (2000), has rightly pointed out that community leades keep liaison with local government authority and local administration for updated flood bulletins and/or warnings. Keeping good contacts with neighbouring villages, Unions and *Thanas* would also be useful, especially in receiving information regarding flood warning. By utilizing village-level cell phones, the leaders can call Control Room to receive latest information regarding water levels for the nearest point of the flooding river.

Gandevia , Kasapoglu et al.,(2000& 2004), opined that, there is also a wider role that social worker can play in the context of flood management. A growing body of literature supports the notion of community based flood management is a useful instrument in sustaining communities from the menace of disasters.

Gruntfest, Bechtol and Laurien,(2000 & 2005), highlighted that, in developing countries, the flood related problems are far-reaching, affecting the environment and development of the region. Impacts of flood on livelihood have been a major issue, especially in the rural areas, where agriculture, aquaculture are the major livelihoods.

Siromony, PMV and Twigg (2000), highlighted that, during floods, one may choose from only two major types of response: (i) living with floods while staying inside the household or (ii) escaping floodwaters and taking shelter either in non-flooded areas or in nearby flood shelters, if available.The latter response wholly depends on social organization of the refuge-seeking family and/or availability of collectively maintained temporary flood shelter(s) in the neighbourhood. In the study sub-basins, people consider both the options, while they prefer to consider staying in the homestead as long as possible. It is found from the Participatory Rural Appraisal /Focussed Group Discussion (PRA/FGD) that people value the latter option as socially derogatory and consider it as a last resort.

ADRC Data Book, (2002), highlighted that, Asia is the most disaster-prone regions of the world. Statistics show that 38% of the world's disasters between 1975 and 2000 occurred in Asia. 57% of total casualty in past 25 years belongs to Asia. During the same period, flood events contributed to 31% of the total number of events, followed by cyclone or typhoons, contributing 28%. Thus, hydro-meteorological disasters (consists of floods and cyclones) are the most prominent hazards in the Asian region. Asia has several major river systems, which contributes to this high hazard. Asian region is the concentration of high population, and thus, the exposure to natural hazards is also high.

National Water Policy, (2002), expressed that the reviews on community based flood management focus on the following five key themes. Flood forecasting and early warning systems, Impact of climate change on flood risk, Flood resilient

societies through community preparedness, Flood risk management in mega deltas, Torrential downpour, landslides and erosion.

Annual Report Brahmaputra Board, Government of India (2002), The community-facilitated coping measure generally requires planning, participatory operationalization, monitoring, and continuous evaluation of overall implementation of various related activities. To run a smoothly functional 'temporary flood shelter' (hereafter called flood shelter), formation of a Community-based Flood Management Committee is essential. People expressed in one PRA that the Union Disaster Management Committee, as mandatedby the Ministry of Home Affairs, must be activated in order to facilitate CBFM activities at the Block levels, Operationalize "Community-level Flood Management Committee". Develop a participatory management code for undertaking day-to-day activities of the proposed flood shelter.Clearly mark escape routes, preferably showing signs along the escape routes.Assess the overall requirement of space within the flood shelter and if needed, increase capacity elsewhere and/or within the premises. Clean up the premises, provide room for the privacy of the females. Check where to place cooking utensils and stoves. Create sufficient number of sanitary latrines, based on capacity assessment. Make cleaning up schedules for the latrines. Keep frequent contacts with the Thana Health Officer and make arrangements for health check-ups at regular intervals.Create separate spaces for storage of (a) medicine, (b) food items, (c) register books/logbooks, (d) money, (e) dry fuel etc. Provide rooms for treating patients, privacy of lactating mothers and adolescent girls and overall administration of the activities. Liaise with Local Government Institutions and NGOs for various supplies (food items, drinking water, fuel, medicine etc.).Based on capacity assessment, assess weekly demand for various supplies. Maintain charts and logbooks on utilization and supply of such material. Negotiate with government authority to help create a community-based trust fund so that it may be utilized for carrying out various preparedness and rehabilitation activities, as needed. Maintain ledgers while spending from the trust fund.

Herath (2003), opined that, poverty and lack of resources at different levels make people vulnerable. Human sufferings, both in terms of mortality and affected people are prominent in the flood affected region. The high toll from floods in the

region arises from the interaction of the following factors: living in the flood plains which are suitable to rice and other agricultural products, tropical inter-convergence region subjected to high dynamic atmospheric interactions, and the high population density in the flood affected region Over time, settlement patterns and the development of land and infrastructures in flood-prone areas have dramatically increased flood frequency, extent, and subsequent hazards.

Kwok, Halpern and Dynes (2003), pointed out that social worker can be instrumental in the community based flood management. The increasing frequency of the floods and their severe impact on individuals, communities, society, economy and environment in the last few years, the subject of flood management has received greater attention for the Community based disater preparedness (CBDP/CBDM) in developing country like India at all levels.

UNDP Report (2003), highlighted that the need for an effective community based flood management (CBFM) mechanism is of utmost importance as it reduces the chances of casualties and delays in respose to flood management from side of Government. The related literature shows the similarities of community management flood management techniques in Assam and Bangladesh.

Gupta (2003), pointed out that recent experiences increasingly point out that only structural measures are not enough to reduce the flood losses. Therefore, in many developed countries like Japan, USA, non-structural approaches, such as land use and zoning regulations, land acquisition, and environmental restoration programs, are found to be effective and more sustainable.

Few, (2003), Wisner et al. and Moench and Dixit, (2004), described that Impacts on health caused by flood have been a topic of major discussion for several years. A recent analysis by Few et al. (2005) has suggested that improving coping response of the communities is the key to the success to reduce health risk, and this is closely linked to economic and cultural issues. For these reasons, flood mitigation in developing countries should be considered as a combination of hard and soft measures. In this connection, restoring the natural functions of rivers and floodplains, planning and management practices, involving the local communities in the river

basin management, capacity development of the local institutions are found to be effective measures of sustainable flood management.

As argued by **Shaw and Goda (2003),** in Japan, in many rural mountain communities, shift damage risk of one community makes other communities vulnerable. In a river basin system, upstream community should be strongly linked to the downstream community, and communication regarding community level interventions should be well coordinated.

Jegillos (2003), Murshed, (2004), highlighted that it has been a common notion that grass root initiatives are the responsibilities of the non-government organizations and community people. Community Based NGOs have been the leading actors in this field for several years, and contributed to the development of the community based approach.

Dixit.A, (2003), pointed out that recognizing the limitations of Government, the CBFM approach promotes a bottom-up approach working in harmony with the top down approach, to address challenges and difficulties. To be effective, local communities must be supported to analyze their hazardous conditions, their vulnerabilities and capacities as they see these. Thus it promote community based approach.

UNDP Report (2003), The community concerned generally take note of the following few activities to minimize negative flood impacts Activate the 'Community-level Flood Management Committee's (FMCs). If there is none, they form such a Committee and assign responsibilities/ duties to the members, individually and/or in small groups. Quickly assess needs of the poor, females and the disadvantaged in thecommunity. Prepare plans based on needs assessment for relocation, preparedness and relevant action. Identify community flood shelters based on their accessibility, location, facilities and capacity etc. Identify safest means and road-plans for relocation/evacuation in those designated flood shelters. Discuss it with the community people and make them aware of the shelters. Prepare the designated flood shelter(s) in terms of (a) cleaning up the premises, (b) preparing large-size cooking stoves, (c) sinking afresh or elevating the existing tubewell above flood danger level, (d) making smaller rooms available for health care check-ups, lactating

mothers and children, chambers for privacy of adolescent girls, storage of medicine and food items, and for storage of fuelwood/ biomass and/or kerosene, and arrange lanterns for lighting. Identify alternative shelters and expand capacity of shelters to prepare for the worst.Ensure that a few boats, maintained in working condition, are at the disposal of the VDMC(Village Disaster Management Committees) to facilitate relocation of the elderly, the children and ailing/pregnant women. Make a few cages, using low-cost material, collect fish fingerlings and begin 'cage fish culture'. Nilotica and Pungash varieties of fish grow very well under confinement of the cage, especially when adequate feed is supplied to the growing fish. Growing fish fingerlings in confinement, during the course of the entire flood season, would enhance income by the end of the flood season – which in turn would enhance greater financial opportunity for carrying out post-flood rehabilitation.

Srivastava, H N (2004), highlighted that the community participation has been recognized as a necessary element to reverse the worldwide trend of the increase in disaster occurrence, particularly small and medium scale disasters. The experiences and practices in community based disaster management show the positive impact of the participatory approach to disaster preparedness, disaster mitigation and disaster risk reduction. There is paradigm shift from relief of Government side to preparedness at the level of Community. The initiatives taken under community based disaster preparedness is receiving support of the central and state governments to strengthen the disaster management capacities for nearly a decade.

Shaw, (2004), opined that community involvement often faces the problem of sustainability over a longer period of time. Government, non-government and international organizations implement various programmes before and after the disasters. Many of them are very successful during the project period, however, some of them gradually diminish as the years passed.

ADPC Report. (2004), There is a general perception among people living in flood vulnerable areas about flood events which are generally damaging. According to people's perception, annually occurring low-level flood events are most usual and they do not worry about such flooding. People call it '*barsha*' and often find it useful for replenishment of top soils. On the other hand, there are events, which disrupt life, to some extent cause damage to agriculture and to a lesser extent to the infrastructure.

These moderate events are called *'bonna'* in local terms. People also can identify unusual flood events, which they call 'plabon' or 'moha-plabon'. These are, according to local perception, most damaging – causing damages to crops and cropping potential during *'kharif'* season; completely disrupting life and economic activities; lasting for a long period, often weeks together; wreaking havoc on the physical infrastructure etc. People find 'flood preparedness' as the most viable tool for them to manage floods, as reported during the PRA/FGD.The community must be part of flood risk identification, prioritisation, plan formulation, implementation, monitoring, and evaluation . People are involved in all aspects of the flood risk management process, beginning with assessment. Community-based risk assessments can be carried out using participatory rural appraisal (PRA) tools, which can gather the information needed for assessing the community's risk. A community risk assessment allows all community members to participate, and to identify the fl ood hazard they face and understand it. The assessment provides them with the information they need to enable them to participate in decision making. Risk mapping can be a community project that encourages participation and awareness. It is an exercise that not only produces a risk map that is understood by the participants, but also informs them of potential hazards, vulnerability of risk elements, and potential exposure.

Gupta (2005), described that only focusing on structural approaches by Government agencies is not environmentally sustainable and can cause severe environmental degradation locally and downstream.Thus self help initiated by the community have better results in flood management. He pointed out that CBFM strengthens social cohesion and cooperation within the community and society in coping with flood thereby widened the scope of cohesiveness in a multi-cultural country like us It builds confidence among individuals, households, communities for any undertaking including disaster preparedness and mitigation. Through CBFM it is hoped that communities would be strengthened to enable them undertake any programs of development including disaster preparedness and mitigation.

UNDP Reports (2005), There are many reasons for gradual decrease of people's involvement in a project. The most common elements are partnership, participation, empowerment and ownership of the local communities. Unless the disaster management efforts are sustainable at individual and community level, it is

difficult to reduce the losses and tragedy. While people should own the problems and, consequences and challenges of any mitigation and/or preparedness initiative, it is necessary to see people's involvement in a broader perspective, which is related to policy and strategy.

Goel, S. L (2005), pointed out that floods are common in Assam and Bangladesh. Assam has been traditionally vulnerable to floods and regular phenomena in India. The multi-hazard scenario depicted in the Vulnerability Atlas of India (produced by Building Materials and Technology Promotion Council (BMTPC),New Delhi, India), shows that over 40 million hectares is prone to floods in India. In Bangladesh floodplains constitute about four-fifths of the landmass. The floodplains are formed by sedimentary deposits that are carried by three of the largest rivers of the world originated in India, viz., the Ganges, the Brahmaputra and the Meghna (GBM) and their numerous tributaries and distributaries including Barak. The country is situated at the end of the catchment area of the GBM river systems, occupying only about 7.5 percent of the combined catchment area. Thus the floods in Assam have direct and similar impact in Bangladesh and as such community based flood management techniques in Assam and Bangladesh have great similarities. From time immemorial, people living in these regions have adapted to such annual events over the centuries and found ways to take advantage of it and have developed their own coping mechanisms in dealing with floods.

Bechtol V. and Laurian L. (2005), highlighted that any local population would have local knowledge regarding vulnerabilities and capacities. They are repositories of traditional coping mechanisms suited for their specific environment that they have developed from previous experiences in dealing with disasters. Due to exposure and proximity to hazardous conditions, a local population responds first even before assistance from aid givers arrives at times of crisis. By using what is available locally, a timely response is possible. Timeliness in emergency response is critical because this determines how many lives would be saved or how many properties can be prevented from being damaged.

Delica-Wilson, (2005),expressed that it highlighted the role of NGO and community based coping strategies . it is found that many of the NGO activities face the problem of sustainability over a longer period of time, especially once the NGO

withdrew from the field of flood management . Many of the NGO programs are poorly designed and so they are unable to either to either attract continuing support or transfer project ownership to communities. Continuation of community activities over a longer period of time at local level, as well as local institutions can continue the CBFM activities. Thus, even though the initiatives are started with the NGO interventions, it is important to link them to the local community activities, and incorporate them into Flood Preraredness Plan(FPP) to ensure its sustainability and replication of innovative efforts to other parts of the flood prone areas. Thus, the major challenges of the community based disaster management (CBDM) are: 1) sustainability of the efforts in the community level, and 2) incorporation of the CBDM issues in the planning level. To be effective and to create sustainable impact, the application of the CBDM must go beyond the initiative of communities, NGOs and a handful of local governments. As part of an advocacy for more responsive and effective governance, national and state level governments should look at integrating CDBM in their policy and implementing procedures.

Few R. Ahren M., Matthies F., and Kovats S. (2005), elaborately described that health care and hygiene initiatives taken by communities can be outlined as keep recording the state of health of each of the family members. Transfer sick member to nearest health care center. Provide drinking water, fodder and animal feed to livestock and poultry, as needed. Avoid defecation in open water (otherwise it will be polluted and affect others), try to use sanitary latrine. Use 'oral saline' when there is an outbreak of diarrhoeal disease. If deemed necessary, quickly transfer the patient to the nearest hospital/health care facility. Keep carbolic acid in small bottles (mouth remaining open) hanging along the outer sidewalls (out of reach of children) to avoid snake invasion and snakebites.

Bechtol V. and Laurian L. (2005), highlighted that restoration of means of communication are done in communities by community people (self help). At community level, repair breached embankments, if any, and reestablish a sense of security as soon as possible are done by community leaders. Mend and/or reconstruct religious centers in a participatory fashion and restore religious activities as early as possible done by community leaders. Make community-based efforts to restore road networks by reviving the washed off rural roads and reestablishing the

culverts/bridges etc repair, in a participatory manner, partially or fully destroyed local educational institutions (schools, madrasas, colleges etc.) and restore academic activities as soon as possible done by community leaders. Reconstruct, if needed, local markets and community centers, restore usual community-based activities in public places done by community leaders.Reestablish telecommunication network, if necessary (perhaps becoming redundant with the advent of satellite telecommunication services done by community leaders with Government help.Through community participation each and every damaged elements are reconstructed and sustained and thus community based flood management is important for reconstruction and sustainenance of reconstruction.

Kumar, A, (2006), opined that the research shows that low income and marginaliosed communities are likely to suffer a downward spiral of deterioration after a flood. Thus it proves that more advanced communities has better coping starteigies than a low income and marginaliosed community.

Singh R.B (2006), highlighted that the local community is the main focus of community based flood preparedness programme because, it is the community which is adversely affected by a flood and, more importantly, it is the first responder to the event. In the absence of specialized skill, people use their traditional coping and survival strategies to respond to the event long before outside help reaches them. The more effective coping strategies help the communities to survive from the disasters without any outside help; the best example is flood in Assam. The people of Assam are so well versed with the traditional coping mechanism that the numbers of casualties are very low as compare to Maharastra and Gujrat. With the change in approach from post- disaster emergency response to disaster risk reduction, emphasis is laid on proactive pre-disaster interventions such as prevention, mitigation and preparedness. While natural hazards can not be prevented, measures can be initiated for preventing hazards from turning into disasters by strengthening the coping capacities of the communities The literature on Community based disaster preparedness focuses extensively on the coping strategies of the individuals, groups and communities to deal with disasters before the arrival of Government or external help. The traditional coping strategies are very much helpful in minimizing the loose of the nations. The communities which have weak coping capacities the loss in terms

man and material are more as compare to those who have well structured coping capacities.

Aslam Perwaiz , ADPC (2006), opined that , it is necessary to take measures to grow vegetables within the homestead. Agriculture Officers can play vital roles in enhancing support for extension of homestead horticulture by providing seeds of quick-growing varieties. Nursery establishment Establishment of nursery can be a profitable agro-business, which requires active support from the community itself. Pond re-excavation for fisheries. A few members of a community can re-excavate an unproductive pond (*pukur*) and start small-scale fish culture. The larger community can facilitate access to credit and other services for such local initiativesA community easily assess the transportation needs of the local community members and run a small-scale transport business. Such an activity will also provide employment for some people.

Singh R B(2007), highlighted that it is common knowledge that the people at the community level have more to lose because they are the ones directly hit by disasters, whether it is a major or a minor one. They are the first ones to become vulnerable to the effects of such hazardous events. The community therefore has a lot to lose if they do not address their own vulnerability. On the other hand, they have the most to gain if they can reduce the impact of disasters on their community. The concept of putting the communities at the forefront gave rise to the idea of community-based disaster management (CBDM). At the heart of the CBDM is the principle of participation. Through the CBDM, the people's capacity to respond to emergencies is increased by providing them more access and control over resources and basic social services. Using a community-based approach to managing disasters certainly has its advantages.

Dekens, J. (2007), described that the other issue of community based disaster management is the up-scaling of the initiative. There have been too many good practices, however, most of the good practices have remained confined to their local communities only. Their potential in influencing attempts to reduce vulnerability in other parts of the world is enormous. While, an innovative approach is found to be effective in one village, one district, the challenge is how to disseminate the best practices widely.

Ghani, M.U. (2007), highlighted that preparedness for floods and minimizing negative flood impacts communities has grater idea than a Government. In order to take measures towards preparedness, people need to understand that a flood is imminent. The general basis of information on which people tend to make preparedness decisions is rather weak, as found during the PRA/FGD. There is no dissemination of real-time information on floods. There are bulletins aired by the All India Radio (AIR) from time to time during the flood season; however, such bulletins are often packed with technical terms and cannot be understood by rural illiterate people. People often seek information either from the Chairman or the members of the village disaster management committee (VDMC), local teachers, religiouse leaders and most of the time they do not receive any satisfactory information with any degree of certainty. In the absence of information, people heavily rely on natural instincts: movements of ants, lizards and the kind. Precautions taken in the past, based on such observations, have sometimes paid good dividends, but often provided wrong conclusions regarding timing and severity of the event. There is a dearth of information concerning flood forecasting and warning well ahead of time. Once people sense an imminent danger, they engage themselves in various informal ways to take preparedness measures. Being aware of an imminent *bonna* or a *plabon*, people start to think about a possible relocation and restructuring of cropping pattern. Such decisions are arrived at the household level, and people often do not share their intention deliberately with other members of the community. Their intention to relocate is only shared when they are questioned by their neighbours. In the absence of a 'formal institutional approach', community-level activities often do not get due priority for community-wide preparedness.

Kumar A,(2007), opined that Community Based Flood Management in terms of crop selection, alternative practices, livestock & poultry, household activities focuses on agricultural preparedness at the community level may have little scope, especially in the absence of agricultural cooperatives. For the common interest of the community members, there may be a number of activities that would enable the farmers to safeguard their livestock, agricultural machinery and equipment, unutilized fertilizer and most importantly, seeds. Make arrangements for safe storage of agricultural equipment, fertilizers and seeds, preferably in a common place where vigilance is possible, even during high floods.Put name tags or signs & symbols, preferably

printed in permanent (water resistant) ink, on each of the items to be stored in a common storage. Make arrangements, in cooperation with the 'Agricultural sub-Committee', in order to resist theft and avoid mishandling.

Mishra, P. K (2007), highlighted that Agriculture is the major economic activity of the rural households. People living in the floodplains have been practicing a number of adaptation techniques to avoid large-scale losses due to floods. Opting for alternative crop calendar, suited to the flood condition and making best use of the remainder of the cropping season, collection of suitable seeds, making seedbeds on raised lands, storing seeds in containers hanging from the ceiling – these are all observed as traditional coping practices.

Arun Bhakta Shrestha and Syed Harir Shah Rezaul Karim, (2008), are of the view that studies undertaken by Researchers in Bangladesh and Nepal demonstrate that communities, based on experience and close relationships with their local environment, know about flash floods and have developed strategies that help save life and reduce damage to property. Local knowledge can provide information related to local environmental variability and specifi cities; local perceptions of natural hazards; risk tradeoffs in the context of multiple stresses; vulnerable groups and individuals; the local elite and power relations; and changes in people's vulnerability to natural hazards over time. Examples of potential applications of local knowledge in fl ash fl ood management include local advice about safe locations and construction sites (buildings and roads), combining local knowledge with conventional knowledge for hazard mapping, early warning systems, surveys, and other inventories to verify information, adapting communication strategies to local understanding and perceptions, and integrating local values into decision-making processes.

The 5th International Conference on Flood Management Report (ICFM5, 2008), it marks the continued advancement of flood management practices and policies around the world. The name change from "Defence" as used in the previous four events to "Management" is reflective of the more integrative approaches to flood management that nations are increasingly employing. The ICFM5 theme is "Floods: From Risk to Opportunity", reflective of the continued trend towards a broader understanding of how we collectively make use of the opportunities provided by

floods and flooding, cope with risks posed by them and plan for and respond to flood events. It provides a unique opportunity for these various specialists to come together to exchange ideas and experiences. Societies continue to occupy floodplains and delta areas that are highly susceptible to the incidence of severe flooding. At the same time, the threat from climate change continues as witnessed by the changes in frequency and severity of inland floods and coastal storms. International and regional cooperation and collaboration is critical to the success of the overall flood damage reduction process.

Somkuwar A,(2010), highlighted that various nations and regions throughout the world are increasingly demonstrating their capacity to devise effective policies and measures to address the challenges they face due to increased risks from the impacts of climate change, increased urbanization, and environmental degradation. Risk management efforts provide opportunities to establish efficient institutional collaboration, promote living wisely with floods and the better use of floods as vital resources. Many international efforts are focusing on assisting nations and regions in dealing with challenges of water related disasters.

Somkuwar A and Das H. N (2010), highlighted that the community based flood management approach with a view to preserving the crop and other agricultural resources at household levels communities reduce the loss burden through harvesting premature standing crops (*viz.*, vegetables etc.) if there is a threat of such crops being inundated. It is necessary to take early measures such as seed preservation for expediting agricultural activities following recession of floodwaters. Efforts must be made to preserve sufficient amount of seeds in each household. Preservation of seeds is a measure to ensure seed availability after the flood. Seeds of the following crops may be preserved: paddy, pulses, oil and potato seeds etc.It is also necessary to create/develop adequate number of seedbeds in the flood free areas. With prior agreement with a household, several families can be benefited mutually by sharing the burden of seed procurement and preparing a flood free land to develop the seedbed. For fish culture, raise the height of the banks of ponds that are at risk of inundation by floodwaters, to protect fish from escaping. At least, raise a fence with tree-branches and nylon nets firmly attached to the surface of the banks to protect fish from escapeding.If raising a fence becomes impossible, catch the fish prematurely and sell

it to recover partial cost of production.It is necessary to monitor flood embankment (if any) and take precautionary measures so that it may avoid breaching. Seedbed can be prepared/arranged on the floating platforms made of banana or bamboo plants (called *bhela*).Seeds can be preserved in those relatives' houses who are located on high (flood free) land. Plant vegetable-producing plants/herbs/creepers on raised lands in the homestead grounds to grow seasonal vegetables etc.

Narayan .B. (2010), pointed out that in the absence of a suitable infrastructure that might be transformed temporarily as relelief to each households of flood victims, community based approach help to keep laison with the local *Thana*-level and/or district-level administration, and thus to enhance local level capacity to facilitate flood management. Community people help to shift marooned people into flood shelter(s) and/or to flood camps. In the relocation process no Government or relef agencies can be as effective as the community people themselves.

Bose B.C. (2010), True to their proverbial resilience, people in flood affected areas are keen to bounce back to their usual quotidian lives despite incurring heavy losses in terms of crops, livestock, and property. As reported in the FGD/PRAs, neighbours help each other in getting back to 'normal life' following floods. Interpersonal relationship and kinship often play a vital role in deriving assistance from one's neighbours/ kins folk. Community approach to mend partially damaged houses, often by means of offering free labour, is very common. Well-to-do people sometimes employ poor neighbours in restoration activities, thereby offering temporary employment. Sometimes access to credit is deliberately increased and offered to the poor, but often at a very high interest rate.

UNDP and ASDMA Report (2010), stated that management of relief and rehabilitation programmes done at community level, assess losses incurred by each of the community households in a participatory manner and also assess the needs of households for their restoration. Re - consider needs of community households and prepare a participatory plan for recovery and restoration. At household level, facilitate activities of VDMC for the distribution of relief material, restoration of communication systems (roads/ bridges/electric wires etc.). By the end of April of the following year (by *Bangla* new year), assess how far relief and rehabilitation activities have covered, what could not be done, and evaluate the whole rehabilitation process.

Document every aspects of relief and rehabilitation, including the impediments and institutional bottlenecks. Strengthen activities of the Community Flood Management Committee towards drawing attention of Government and non-Government organizations for adequate supply of relief. At community level, liaise with relevant GO/NGOs and help bring relief. Distribute relief on the basis of needs and priorities

Kumar Arvind (2010), highlighted that at community level, collect and distribute seedlings, as needed. At community level, help negotiate soft-term credits for the poor families to restore economic activities (e.g., crop production, horticulture, agroforestry, nursery, pond-culture, small-scale industries/workshops, smallscale trading etc.). At household level, contact Agriculture Officer for guidance in relation to selection & collection of seeds, assessment of suitability of crop for the remainder of the Kharif period, selection of feed for the livestock and poultry. The technologies suggested by the relevant government agencies towards restoring post-flood agricultural activities.

Sinha P C,(2010), opined that community can collectively negotiate with credit-offering lending institutions (banks) for soft term loans for various purposes, particularly for purchasing seedlings from elsewhere. Collectively, a community can also demand assistance of the Agriculture Office for arranging seedling collection and distribution. By attending to the meet the demand for agricultural restoration, a community can greatly facilitate regeneration of economic activities in a flood-affected area. The following activities deserve special attention. A community may collectively look for an increase in seedling supplies from the neighbouring non-flooded (upland) areas, as has been observed following the1992,1999,2004 and 2007 floods. The poor farmers may be offered seedlings as loans to make the best use of the remainder of the post-flood crop season, which may be repaid following harvest.

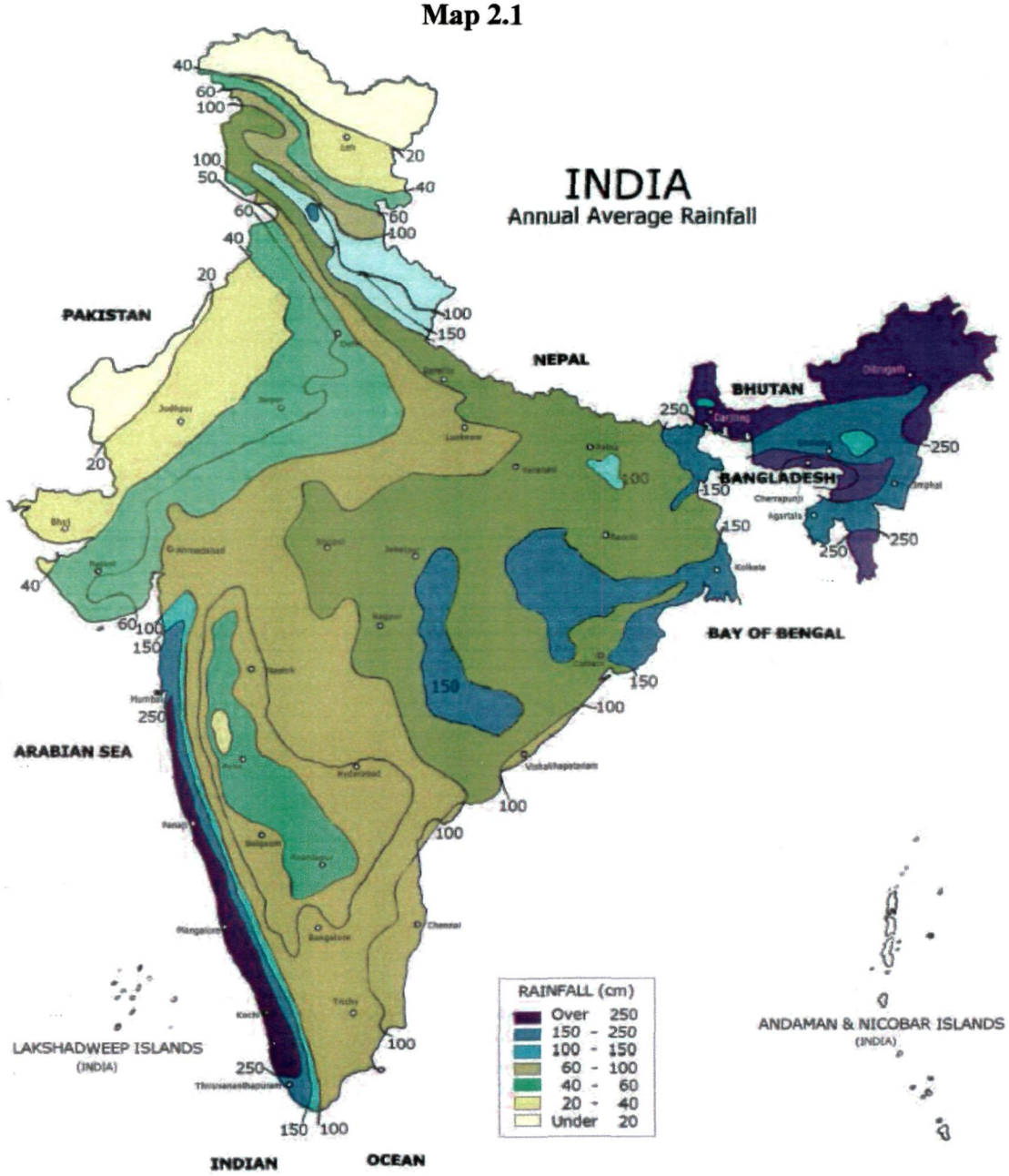
2.2 Conclusion:

The reviews highlighted depicted the applicability of community based flood management in present day world. The above reviews highlight how communities manage for food items, livestocks, agriculture, shelter and it is also found that some

level of good flood management planning is noticed in some of the communities in Bangadesh and Assam where they plan and keep the records of past floods and the sources for help. This is how the communities themselves contribute for paradigm shift from releief centric approach to preparedness. Self help is the best help and the coping mechanisms used by the community have proved it.

The current study is to further the understanding of the community based flood management in Assam with particular reference to the Cachar district. The communities are the first responders for flood and thus they prepare themselves for pre, during and after flood flood situation. The study is intended to understand the contextual situation of the community based flood management system emerged and the response of people towards the whole flood management mechanism. Further, the study attempts to understand the coping mechanisms used by the community and local NGOs in dealing with floods.

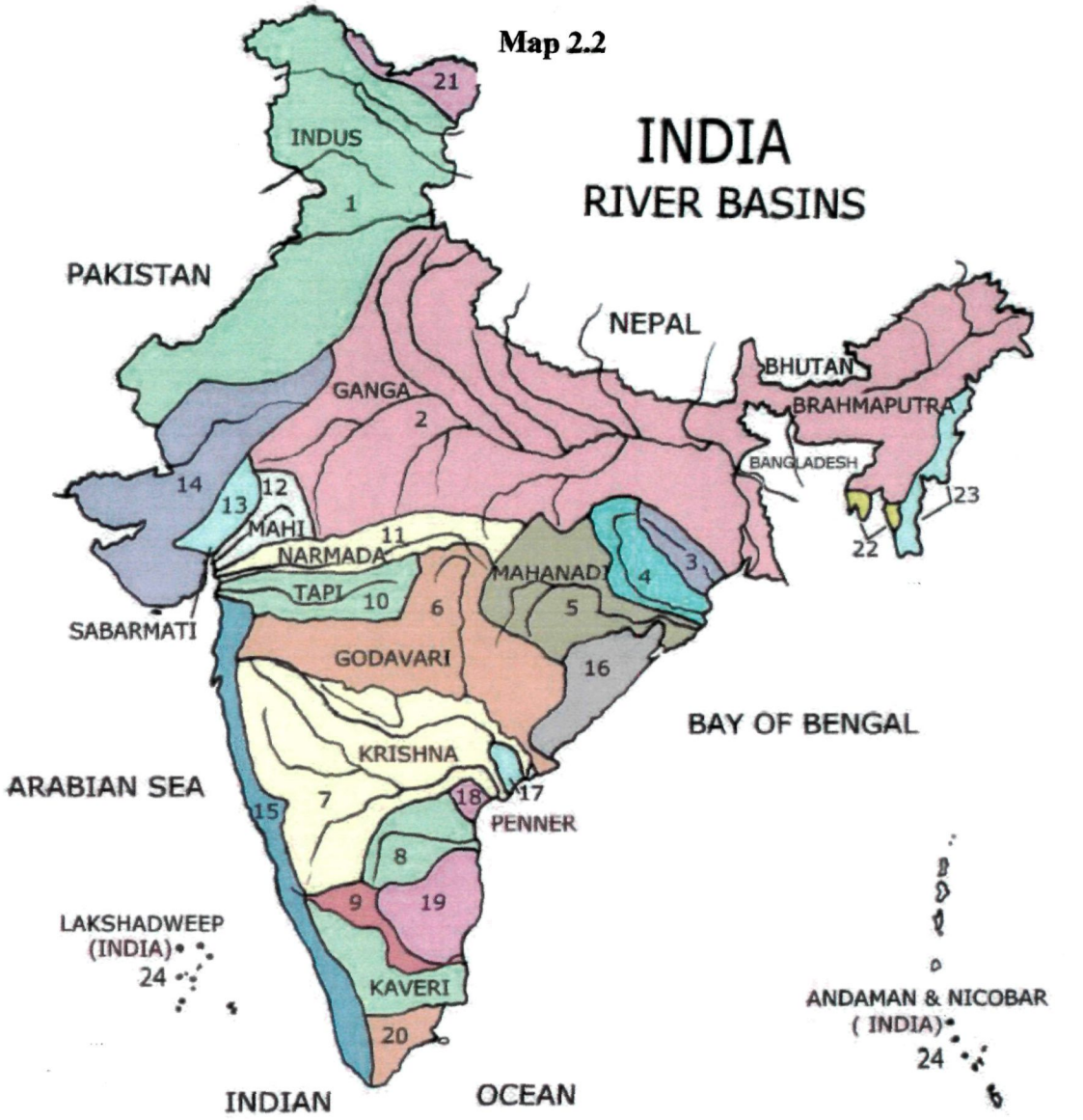
Map 2.1



MAP: NOT TO SCALE

Source: School Atlas, Survey of India , Dehradun.

Map 2.2



NAME OF BASINS

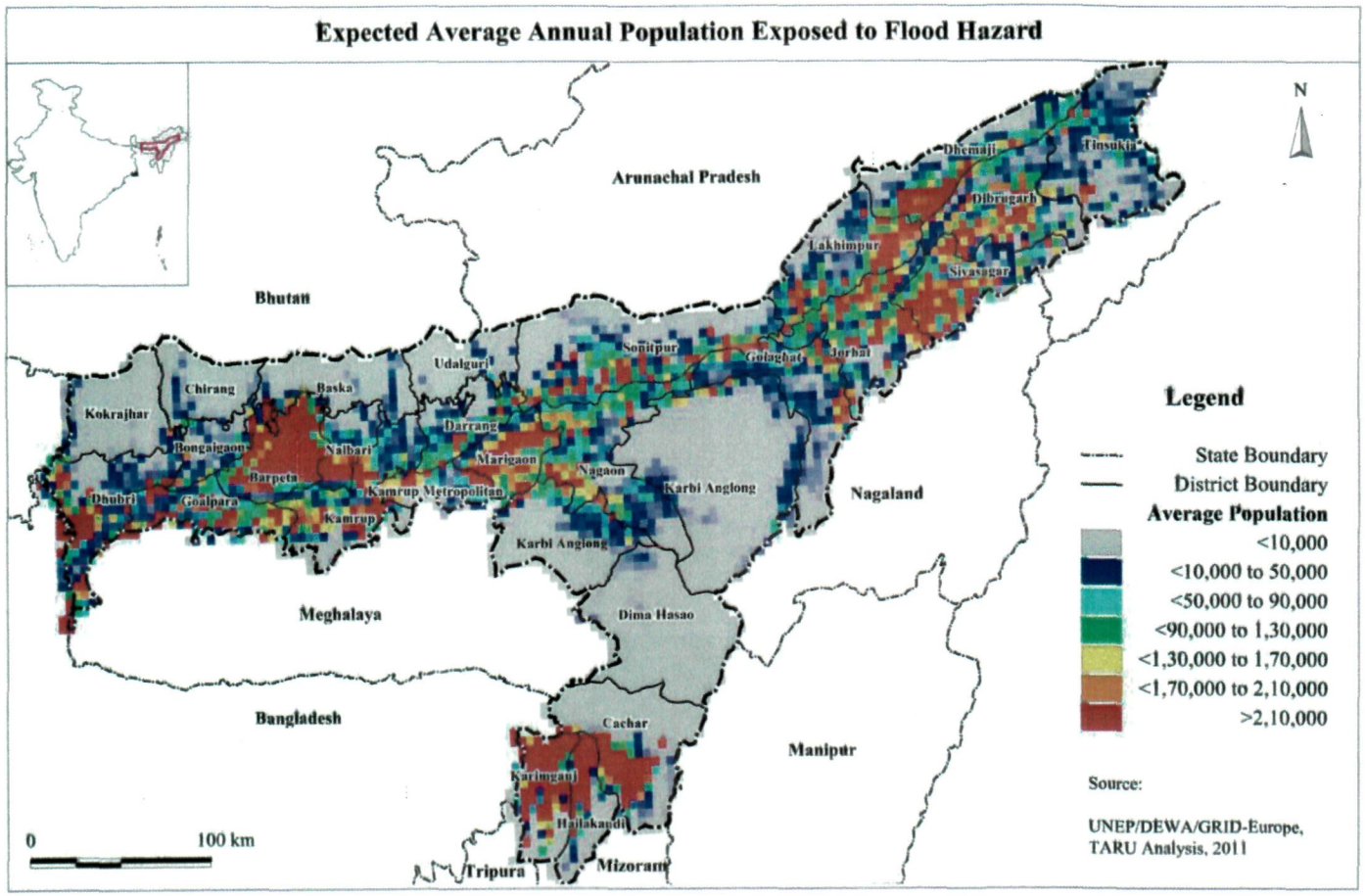
1. Indus
2. Ganga-Brahmaputra-Meghna Basin
3. Subarnarekha
4. Brahmani-Baitarani
5. Mahanadi
6. Godavari
7. Krishna
8. Penner
9. Kaveri
10. Tapi
11. Narmada
12. Mahi
13. Sabarmati
14. West Flowing Rivers of Kachchh & Saurashtra
15. West Flowing Rivers South of Tapi
16. East Flowing Rivers between Mahanadi & Godavari
17. East Flowing Rivers between Godavari & Krishna
18. East Flowing Rivers between Krishna & Penner
19. East Flowing Rivers between Penner & Kaveri
20. East Flowing Rivers South of Kaveri
21. Area of North Ladakh Not draining into Indus
22. Rivers draining into Bangladesh
23. Rivers draining into Myanmar
24. Drainage Area of Andaman & Nicobar and Lakshadweep

MAP: NOT TO SCALE

Map 2.3


India
Flood Hazard Map
JAMMU & KASHMIR
Srinagar
HIMACHAL PRADESH
Shimla
PUNJAB
UTTARANCHAL
HARYANA
DELHI
NEPAL
SIKKIN
ARUNACHAL PRADESH
BHUTAN
NAGALAND
ASSAM
MEGHALAYA
BAGLADESH
MANIPUR
TRIPURA
MIZORAM
RAJASTHAN
Jaipur
UTTAR PRADESH
BIHAR
MADHYA PRADESH
Bhopal
JHARKHAND
WEST BENGAL
Kolkata
CHHATISGARH
GUJRAT
Gandhinagar
Silvassa
Dadra & Nagar Haveli
Mumbai
MAHARASHTRA
Bhubaneshwar
ORISSA
ARABIAN SEA
BAY OF BENGAL
Hyderabad
Yanam (Py)
Panaji
GOA
KARNATAKA
ANDHRA PRADESH
Bangalore
Chennai
Pondicherry
Karaikal
KERALA
TAMIL NADU
Lakshadweep Islands (INDIA)
Kavaratti
Thiruvananthapuram
Port Blair
Andaman & Nicobar Islands (INDIA)
INDIAN OCEAN
I N D I A
LEGEND
Capital Town
Rivers
Area liable to flood
Probable Max Storm surge Height (m)
International Boundary
Map : Not to Scale
Source : Flood Atlas 1987, CWC,GOI.

Map 2.4


Expected Average Annual Population Exposed to Flood Hazard
N
Arunachal Pradesh
Bhutan
Meghalaya
Bangladesh
Nagaland
Manipur
Tripura
Mizoram
Dhemaji
Tinsukia
Dibrugarh
Lakhimpur
Sivasagar
Sonitpur
Golaghat
Jorhat
Udalguri
Chirang
Baska
Kokrajhar
Darrang
Bongaigaon
Nalbari
Marigaon
Nagaon
Barpeta
Karbi Anglong
Dhubri
Goalpara
Kamrup Metropolitan
Kamrup
Karbi Anglong
Dima Hasao
Cachar
Karimganj
Hailakandi
0
100 km
Legend
State Boundary
District Boundary
Average Population
<10,000
<10,000 to 50,000
<50,000 to 90,000
<90,000 to 1,30,000
<1,30,000 to 1,70,000
<1,70,000 to 2,10,000
>2,10,000
Source:
UNEP/DEWA/GRID-Europe,
TARU Analysis, 2011