FLOOD PREPAREDNESS PLANNING

Introduction

> ***Disaster means a catastrophe, a calamity or mishap, a grave occurrence, which causes a serious disruption of the functioning of a society, causing widespread human, material or environmental losses exceeding the ability of the affected society to cope using only its resources***

Due to its unique geo-climatic conditions, India is one of the most disaster prone countries in the world. 24 out of 35 States and Union Territories are vulnerable to one or the other geo-climatic disaster. Over 55% of landmass is vulnerable to earthquakes, 8% to cyclone, 5% to floods and 70% of the land under cultivation is vulnerable to drought. The loss in terms of lives and assets has been incalculable. A disaster wipes out the gains achieved in decades of development in the affected area.

Repeated disasters threaten sustainable development. In the past twenty years, earthquakes, floods, tropical storms, droughts and other calamities have killed more than 3 million people globally, inflicted injury, disease, homelessness and misery on one billion others and caused damages worth millions of rupees. Disasters destroy decades of human effort and investments, thereby placing new demands on society for reconstruction and rehabilitation.

Disasters are either natural, such as floods, droughts, cyclones and earthquakes, or human-made such as riots, conflicts and others like fire, epidemic, industrial accidents and environmental fallouts. Globally, natural disasters account for nearly 80% of all disaster affected people. According to the insurance company estimates, natural disasters represent 85% of insured catastrophe losses. If one adds the losses in countries like India, where most of the property of the people, especially in the rural areas remains uninsured, the losses are astronomical.

The unique geo-environmental setting of the North eastern region vis-à-vis the Eastern Himalayas, the heavy rainfall, weak geological formations, accelerated rates of erosion followed by silting and meandering of rivers, very high seismicity makes the North East one of the most disaster prone regions in the country. Considering this, and the comparative inaccessibility, the North-eastern region demands special attention to minimize loss of lives and social, private and community losses and to ensure sustainable development.

Vulnerability to natural disasters combined with socio-economic vulnerability of the people living in the region pose a great challenge to the government machinery and underscores the need for a comprehensive plan for disaster preparedness and mitigation. Training and capacity building of the officials dealing with emergencies would be an important instrument of disaster reduction and recovery.

While natural hazards cannot be controlled, the vulnerability to these hazards can be reduced by planned mitigation and preparedness measures. There needs to be concerted and sustained steps towards reducing the vulnerability of the community to disasters.

Taking into consideration the value of development gains which are wiped out through disasters, as also the huge quantum of funds required for post disaster relief and rehabilitation, any investment in disaster mitigation will yield a higher rate of return than any other development project. Also considering the developmental gains, which are wiped out because of disasters, all development schemes/projects will need to incorporate disaster assessment and vulnerability reduction as critical components in order that the development process be sustainable. **Therefore, a paradigm shift has now taken place with the shift in focus from reactive to proactive ie from relief to prevention and mitigation of disasters.**

In the Government of India, the Ministry of Home Affairs is the Nodal Ministry for disaster management except for drought, which because of its nature will continue to be handled by the Ministry of Agriculture. Where a calamity/disaster pertains to a specific sector it will continue to be handled by the relevant Ministry with the assistance of the Ministry of Home Affairs - thus rail accidents will continue to be handled by the Ministry of Railways, Airlines accident by the Civil Aviation, Epidemic by the Ministry of Health, etc.

FLOODS

Floods are among the most common and destructive natural hazards causing extensive damage to infrastructure, public and private services, the environment, the economy and devastation to human settlements. Recurring flood losses have handicapped the economic development of both developed and developing countries.

Floods usually are local, short-lived events that can happen suddenly and sometimes with little or no warning. They usually are caused by intense storms that produce more runoff than an area can store or a stream can carry within its normal channel. Rivers can also flood its surroundings when the dams fail, when ice or a landslide temporarily block the course of the river channel, or when snow melts rapidly. In a broader sense, normally dry lands can be flooded by high lake levels, by high tides, or by waves driven ashore by strong winds. Small streams are subject to floods (very rapid increases in runoff), which may last from a few minutes to a few hours. On larger streams, floods usually last from several hours to a few days. A series of storms might keep a river above flood stage (the water level at which a river overflows its banks) for several weeks.

However, all floods are not alike. Some floods develop slowly, sometimes over a period of days. But flash floods can develop quickly, sometimes in just a few minutes and without any visible signs of rain. Flash floods often have a dangerous wall of roaring water that carries rocks, mud, and other debris and can sweep away most things in its path. Overland flooding occurs outside a defined river or stream, such as when a levee is breached, but still can be destructive. Flooding can also occur when a dam breaks, producing effects similar to flash floods.

Flood has always been a recurrent phenomenon in India. According to the ***HPC Report*** of Government of India, around 75% of the total rainfall is concentrated over 4 months of monsoon (June – September) and, as a result almost all the rivers carry heavy discharge during these four months.. Around 12% of the country's land area is prone to floods which means around 40 million hectares are prone to flood and annually on an average 8 million is affected by floods. The most flood prone are the Brahmaputra, Ganga and the Meghana basins. The states are Uttar Pradesh, Bihar, West Bengal, Assam and Orissa. But of late floods have also become a serious affair in the states of Andhra Pradesh and Gujarat. Over 30 million people are displaced annually.

The frequency and intensity of floods has grown in the country over the years primarily because of the increased encroachment of flood plains. Interestingly, while the number of deaths caused by flooding has decreased over the last decade, the number of affected populations and economic losses has increased significantly. These trends demand better preparedness at national, provincial and local levels to make sure that appropriate and effective response measures are taken during flood emergency to minimize the loss of lives and properties.

Apart from an effective disaster response system, it is important to have a good flood prevention and mitigation system to achieve objectives of vulnerability reduction. State governments have come forward to take up mitigation programmes like construction of raised platforms, embankments, flood walls, sea walls along the various flood prone rivers, To mitigate flood losses, mostly earthen embankments, drainage channels and a number of town protection works have been undertaken which have provided a reasonable degree of protection. Several non-structural measures, such as flood forecasting and warning and flood-proofing programmes, have also been taken. To minimize flood damage the basic approach is to prevent floodwaters from reaching the damage vulnerable centres. The Flood Forecasting Network of CWC sends information to all the major flood prone inter-State river basins in the country. Information from satellites is used for mapping and monitoring flood prone areas. The Central Water Commission (CWC) under the Ministry of Water Resources issues flood forecasts and warnings. A flood alert is issued well in advance of the actual arrival of floods to enable people to take appropriate measures and shift to safer places.

Despite this, floods continue to be a menace primarily because of the huge quantum of silt, which has raised the bed level in many rivers.During high floods, many breaches occur, causing inundation over vast areas for most of the monsoon months of June to September. The country thus needs a better and effective flood mitigation system

to ensure the safety of its people and economy.

Flood Mitigation Strategies:

There are two different ways to mitigate floods: -

1. Structural
2. Non- Structural

Structural measures are in the nature of physical measures and help in ***"modifying the floods",*** while non- structural measures are in the nature of planning and help in **"*modifying the losses due to floods".***

In the structural measures we keep the *water away from people* and in the non-structural measures to try to keep *the people away from water*. All of these works can be individually divided into long term and short-term measures.

Structural Measures:

a) ***Embankments:*** Embankments have been extensively used for protection against floods of important towns and lands. However, the embankments are now the best means of communication in the flood-prone areas and are being recklessly used for transportation of materials by tractors and other heavy vehicles. During floods, people shift to the embankments for temporary shelter and often settle down there for good. Thus, embankments and their slopes become permanent settlements to flood victims and their livestock. It messes up proper maintenance, and embankments become susceptible to breaches during floods. Whenever there are lapses in maintenance, the protected areas are exposed to serious flood hazards.

b) ***Water Shed Management:*** Timely cleaning, de-silting and deepening of natural water reservoir and drainage channels (both urban and rural) must be taken up.

c) ***Reservoirs:*** The entire natural water storage place should be cleaned on a regular basis. Encroachments on tanks and ponds or natural drainage channel share to be removed well before the onset of monsoon.

d) ***Natural water retention Basins:*** Construction and protection of all the flood protection embankments, ring bunds and other bunds. Dams and levees can also be constructed which can be used as temporarily storing space which reduces the chances of lower plains getting flooded.

e) ***Buildings on elevated area:*** The buildings in flood prone areas should be constructed on an elevated area and if necessary on stilts and platform.

However, complete flood control in terms of structural methods of flood protection are neither economically viable nor these are environment friendly. Therefore, non-structural methods are becoming popular in mitigating flood disaster.

Non Structural Measures:

a) Flood Plain Zoning: Flood plain zoning, which places restrictions on the use of land on flood plains, can reduce the cost of flood damage. Local governments may pass laws that prevent uncontrolled building or development on flood plains to limit flood risks and to protect nearby property. Landowners in areas that adopt local ordinances or laws to limit development on flood plains can purchase flood insurance to help cover the cost of damage from floods.

b) Flood Forecasting and warning: These are issued for different areas mostly by the Central water Commission/ Meteorological department and by the State Irrigation/ Flood Department.

However,an effective Warning System is one that can release warning in advance, i.e. 72hrs, 48hrs and 24hrs. It can change the existing scenario substantially and render informed decision making in adopting proper measures towards disaster preparedness, mitigation, control, planning and management. This kind of advance warning can help the authorities for better flood preparedness and also effective flood mitigation. Therefore, initiatives have to be taken to modernize the operation of Flood Forecasting & Warning by adopting the state of art technology and integrating it into the forecast and warning dissemination process.

Flood Preparedness

Floods, which are a natural hazard, need not become a disaster, if we are prepared and are aware of how to deal with them. This would reduce the losses of life and minimize human suffering. This guide lists simple things one can do to stay safe and protect one from floods.

Before flooding occurs

1. Know the route to the nearest safe shelters that you area aware off.
2. Keep the First Aid Kit ready with extra medication for snake bite and diarrhea
3. Strong ropes for tying things
4. A radio, torch and spare batteries
5. Stocks of fresh water, dry food, candles, matchbox, kerosene etc
6. Umbrellas and bamboo sticks (to protect from snakes)
7. Higher ground where people and animals can take shelter

When you hear a flood warning

1. Tune in to your radio or watch for warning and advice
2. Keep vigil of flood warning given by local authorities
3. Keep dry food and drinking water and warm clothes ready

4. Check your emergency kit

If you need to evacuate

1. Pack clothing, essential medication, valuables, personal papers etc in water proof bags to be taken to the safe shelter.
2. Raise furniture, appliances on beds and tables
3. Put sandbags in the toilet bowl and cover all drain holes to prevent sewage back flow.
4. Do not get into water of unknown depth and current
5. Lock your house and take the recommended or known evacuation routes for your area of safe shelter.

During Floods

1. Drink boiled water or use halogen tablet to purify water before drinking.
2. Keep your food covered
3. Do not let children remain on empty stomach
4. Use bleaching powder and lime to disinfect the surroundings
5. Avoid entering flood waters. If you need to enter then were proper foot wear.
6. Stay away from water over knee level.

After a Flood

1. Stay tuned to local radio.
2. Do not allow children to play in, or near, flood waters.
3. Stay away from drains, culverts.
4. Do not use electrical appliances.
5. Do not eat food, which has been in floodwaters.
6. Boil tap water.
7. Use halogen tablets before drinking.
8. Be careful of snake bites, snakebites are common during floods.

Flood Preparedness Planning

Flood preparedness planning is about putting in place a set of appropriate arrangements in advance for an effective response to floods. Some of the commonly identified flood preparedness activities are:


- Public awareness raising on flood preparedness, response and mitigation measures;
- Stockpiling of emergency relief materials i.e., food, fodder for livestock, emergency medicines, materials for temporary shelter etc;
- Installation of community-based early warning system for issuance of timely and effective flood warnings;
- Management of safe areas for temporary removal of people and property from a threatened location;
- Transportation to safe areas/ evacuation centre;
- Ensuring access to health and sanitation facilities;
- Conducting drills and rehearsals.

The key to flood preparedness planning is to have a clarity and agreement on the roles and responsibilities of relevant stakeholders such as the government line agencies, disaster management organizations, Red Cross, voluntary groups as well as community members. Such an arrangement is possible by forming disaster management committee and teams at various levels to agree on set of standard operating procedures (SOPs) defining what actions to be taken before, during and after floods. The benefits of the flood preparedness planning are many and some of them are listed:

- Systematic arrangement and deployment of resources to reduce the impact of flood disaster;
- Vulnerable communities to get access to crucial information, such as timely flood forecasts and warnings;
- The provision of basic needs, such as shelter and medical care, clean water, sanitation and food during floods;
- Continued access to livelihoods, in order to minimize disruption of economic activities;
- Effective coordination among disaster management agencies to ensure efficient emergency response during floods;
- Urgent restoration of critical infrastructure and measures to be taken to bring normalcy immediately after the floods.

COMPONENTS OF FLOOD PREPAREDNESS PLAN

A flood preparedness plan (FPP) which is an integral component of the multi-hazard disaster management plan, is an action oriented document detailing specific actions to be undertaken prior to floods, which set the ground for effective execution of emergency response and recovery activities during and after floods. The components of a FPP are:

1. **Assessment of probable needs:** Based on historical data from previous flood disasters, officials at the State and district levels compile a list of likely needs and available resources. Gaps between needs and resources are identified in advance and also ways to mobilize them.

2. **Institutional Mechanism for implementation of FPP:** The Flood Preparedness Plan outlines the institutional structure of the States, District or Community level Committees for Disaster Management, its roles and responsibilities before, during and after floods. The Plan also establishes the coordination among the line agencies and other stakeholders in implementation of priority activities identified in the plan.
3. **Activating early warning and disaster response systems:** The FPP defines how to warn the whole community, based on the forecast received from the national and regional agencies and what they should do in advance. The plan ensures ways of involving all stakeholders, according to their roles and responsibilities, and outlines these in the plan.

4. **Resource mobilization and allocation.** Responding to a flood requires resources; therefore the plan specifies what resources are already available at the State, district, community and village levels. The plan also specifies what resources will be needed and where to find those resources.

5. **Communication within and outside the community.** To ensure clear and effective messages in an emergency, the plan specifies how communication will take place and via what media (radio or indigenous systems, etc.)

6. **Sectoral components.** A flood preparedness plan outlines standard operating procedures (SOPs) for specific measures such as search & rescue, emergency medical assistance, provision of water supply and sanitation, food and nutrition, logistics and transport, health, agriculture and environment management, temporary shelter, evacuation procedures; protection and security.

CHALLENGES AND RECOMMENDATIONS

The biggest challenge for Flood Preparedness Planning is the underlying capacities of the State and district authorities as well as the lack of resources to undertake

implementation of the priority activities. In most case, local resources and capacities are often overlooked, thus relying too much upon external assistance. The linkages between disaster management and the national and local socio-economic development processes are most often ignored, resulting in re-creation of risks in already flood prone communities. For a successful flood preparedness planning, it is imperative to learn from the experiences and best practices for greater collaboration and information sharing to enhance the synergy and to extend the resource base for more effective implementation of flood preparedness programs. It is also important to establish and integrate FPP within the overall developmental plan for securing resources for better implementation.

Conclusion

'Forewarned is forearmed', goes the saying, and this country, the world's second most populous and with a large proportion of its people desperately poor, must prepare as best as it can to cope with this new trend of heavy rains and floods. Several steps are, in fact, being taken. The IMD has been promised a major upgradation of its observational network, which should help improve the ability to forecast episodes of unusually heavy rain at least a day or two in advance. The Indian Space Research Organisation is creating a digital database with detailed terrain information that can be used for hazard zonation and damage assessment. The space agency is also acquiring an aircraft that will be equipped with an airborne radar so that imageries of disaster-hit areas can be quickly acquired and used to supplement information from earth-viewing satellites. A National Disaster Management Authority has been established and similar bodies are to be set up at the State level too to enhance preparedness and provide a coordinated response in the event of a calamity. But it is most important to make sure that all these measures come together properly in order to improve resilience and enable an effective relief operation when catastrophes strike.

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