

FLOOD

Among all the natural disasters afflicting the country frequently river floods are the most devastating, which cause maximum damages of life and property in India. Total flood prone areas in India is 40 million hectares. Out of which 9.4% falls in Assam. Besides draught about 90% damages are only due to flood. The Table below shows the average annual loss due to floods.

Table: Average annual loss due to Floods.

	Items	
1	Land Area Affected	7.56 Million Hectare
2	Population Affected	32.03 Million
3	Human Lives Lost	1504 Number
4	Livestock Lost	96713
5	Houses Damaged	11683
6	Houses Damaged	Rs. 136.615 Crore
7	Crop Damaged	Rs. 460.07 Crore
8	Public Utilities Damaged	Rs. 377.248 Crore
	Total Losses	Rs. 982.126 Crore

There is a growing feeling that the incidence and intensity of floods has grown alarmingly over the years. A major cause is the increased encroachment of flood plains because of development and population pressure. The damage caused by floods can at best be minimised and not altogether eliminated or in other words, there can really be no such thing as 'full proof protection' or 'absolute flood control' for all magnitudes of floods. The concept of flood management, therefore, aims for such planned measures which ensure profitable and economic utilisation of the flood plains for the benefit of mankind and at the same time emphasising that during high floods, there is no severe damage to the extent possible.

An essential part of a disaster preparedness plan is the education for those who may be threatened by disaster. Such education programmes take many forms:

1. Public education in schools,
2. Special training for volunteers,
3. Community based extension programmes,
4. Public information through mass media.

Some of the salient aspects pertaining to flood are compiled and collated for benefit of common people.

Types of Flood:

- 1. Flash Local Flood:** If extremely heavy rainfall occurs for some time and the ground loses its absorbing capacity then this type of flood is generally found to occur. These types of floods are of short duration with a relatively high peak discharge.
- 2. River Flood:** If due to heavy rain the water level of river flows much above its danger mark then this type of flood occurs.
- 3. Storm Surge:** Low-pressure storm associated with strong wind causes the level of sea to rise suddenly. If the strong wind is directed on the shore, drive the sea on the land. The storm that produces the surge can also give rise to heavy rainfall inland so that the estuary region can be subject simultaneously to river flooding and storm surge.

Main Causes of Flood:

- Rivers in spate due to heavy and continuous rain for a long period such as few days or weeks.
- Flowing of water much above its danger level due to inadequate capacity within the banks of the river to contain high flows.
- The breaching of embankments.
- The breaching of water reservoir.
- Earthquake.
- Storm surges.
- Snowmelt.
- Synchronisation of flood in the main and tributary rivers.
- River bank erosion and silting of riverbeds.
- Landslides leading to obstruction of flow and change in the river course.
- Poor natural drainage.
- Flow retardation due to tidal and backwater effects.

- **Deforestation.**
- **Cyclone.**
- **The resistance to the flow of water by various reasons.**

Know Your Area:

- **Contact the local flood control department and know about the possibility of flood in your area.**
- **Ask the elderly people in your area to share their experience about floods that occurred in that area as well as the effects.**
- **In a situation of occurrence of flood, know about the possible safe places where you can go along with your baggage.**
- **Ask every member of your family to be prepared for any situation.**

Save Children & Others:

- **If you are in the floodwater, then move in the other direction.**
- **Even six-inch water may imbalance you, so immediately move to a high and safe place.**
- **Keep yourself away from flood effected areas.**
- **Never try to move, swim or play in the floodwater.**
- **If you are inside a car then never try to drive it. But, if you are safe, then instead of sitting inside the car move to a high safe place because even two feet floodwater can wash away the car.**
- **Keep an eye on the snakes and other poisonous animals, which come out of their homes during flood.**
- **Don't drink the floodwater, because it carries germs of various diseases.**

Save Your Property:

- **Keep your important papers, ornaments as well as other properties in a safe deposit box. This box should be placed in such a high safe place where it has less possibility of damage.**
- **Keep yourself away from flood affected buildings. If your house is in a flood effected area, then take extreme care so that you incur less damage.**
- **Raise the platform of your kitchen, store room and toilet so that you can use during emergency.**

What to do before flood:

If there is heavy rainfall for several hours or continuous light showers then be careful, as there may be flood.

- **Listen to the warning broadcast in radio and television about the latest updates of weather.**
- **In such a situation, generally the local stations alert you with the help of loudspeakers or other medium. Listen to the advises they broadcast for the public.**
- **Be careful about the symptoms of flood. Warning means that there may be flood in your area or it starts coming already.**
- **Your Safety is the primary goal. When there is a possibility of occurrence of flood move to a safe place along with your family.**
- **At the time of leaving for a safer place, be careful that you should keep your domestic animals in a safe place.**
- **If you are unable to find any safe place, then leave the animals so that they can find safer places by themselves.**
- **It is easier to drive before the flood comes. Therefore, try to leave the flood-affected area as soon as possible.**
- **To leave for a safer place follow only the indicated way.**
- **If it is not possible for you to reach a safer place, then you should keep first-aid medicines as well as other emergency materials and food stock for few days in a safe place inside your home.**
- **Keeps clean the drains of your house.**

What to do during flood:

- Put off the switch of all the electric and electronic instruments available in your home.
- Move immediately to a high place. If you are inside a room, into which floodwaters start entering, go to the roof of your house.
- Be alert from the poisonous animals, such as snakes.
- Use only purified water for drinking. Your food should not be contaminated.
- If you are outside your house, then move to high and safe place.
- If you are already in floodwater, which is flowing at the height of your loin, then stop moving. Stay there, and look for an alternative way of escape.
- Generally, most of the flood related accidents are found when one tries to swim or play in floodwater flowing with a high current.
- When you are on drive, if you notice that the level of floodwater is rising gradually, then immediately change your route. Don't try to cross the floodwater against its current.
- When there is heavy rain, keep yourself away from pool, embankment as well from rivers.

What to do after flood:

- Due to the polluted water, many types of diseases are found to spread after flood. For first-aid treatment go to the nearby hospitals or medical clinics or make- shift health care camp.
- Go away from the disaster prone areas as your presence may cause problem to the relief operations. Moreover, it will help you to keep yourself safe from the diseases.
- Listen continuously to the latest news of your area through radio, television, and other mediums. If you find any safe alarm then only enter your home again.
- Keep away from the buildings in flood-affected areas as due to flood the possibility of building collapse becomes high.

- Due to flood the possibility of short circuit and leakage of gas becomes more and more high. Immediately after the flood, don't switch on the electric instruments as it may cause fire.
- While entering any building be very careful.
- Use torch light or any other lightning instrument to examine the walls, joints of doors, windows, ventilators, etc of the house. When you find it safe only then enter inside.
- Don't smoke inside the house.
- Cover your food, and drink only purified water.
- Help in the relief operation of the children, elderly and other physically disable people around you.
- Use mosquito net/coils while sleeping.
- Help the local authorities and social workers in the relief and rescue operation.

Responsibilities of Administration:

- Review of Contingency Plan.
- Update / Modify it, if deemed necessary.
- 'Pre Monsoon Inspection' of all railway tracks, canals and drains by respective departments, which could include silt and details clearance from the seasonal rivulets.
- Regular maintenance of embankments of rivers, canals, distributors etc. and regular check of the canals and siphons and clearing them form silt.
- Clearing of storm water and sewerage drains in towns before monsoon.
- Constitution of committees comprising of heads of all emergency services, medical, police, transportation and the district administration to ensure proper co-ordination during the crisis.
- Identification of the flood affected areas.

- **Prepare a multiple database and damages caused by the big floods in the last two or three years. Also mention about the various steps taken when the flood is over to keep the situation normal.**
- **In some regions it is found that water does not flow naturally & remains for long time, which results flash flood. Identify such regions and make arrangement for pumping out the water.**
- **Identify the safe regions where people may gather in large numbers and provide arrangement for pure drinking water. In addition to this make arrangement for healthy food. Also let people to know about these places in advance.**
- **In the district head quarters, set up a relief committee which takes cooperation from chairman of different departments as well as NGOs.**
- **Make arrangement so that all the Public Health department officers remain at their headquarters and provide purified water to the public.**
- **These medical departments should be made alert and ready with medicines and response team to fight against the diseases that spread due to flood.**
- **Make arrangement so that the Supply Department should be ready with petrol, diesel, & kerosene.**
- **To rescue the flood victims to safe places via Jeep, Tractor, Bullock Cart, Boat, Marboat, etc., make arrangement in advance.**
- **Form a rescue and relief team from four/five flood prone villages which can help their own people, animals to reach the safe places in case of emergency.**
- **Monitor the roads to the various villages and make any repairment if necessary.**
- **For emergency be ready with concrete, stone, sand and empty bags.**
- **Keep clean all the drains so that there should not be any blockage to the flow of water. Poor drainage results in local flooding.**
- **Identify the vulnerable locations.**

- Continuously monitor the most possible accident prone areas.
 - Form control centres, which will remain effective during the whole 24 hours.
 - Make arrangement of mobile phone, pager or wireless set for communication during emergency.
 - Make arrangement for significant stocks of woods, C.I. sheets, tarpaulins, mustered oil, kerosene, lighting equipment etc.
 - In far away interior places keep medicines, foods in sufficient quantity
 - Keep the armed and air force ready.
 - Have trust on the press media.
 - Make arrangement of camera/photography/video.
 - In normal situation, make arrangement of motor boats along with life jackets etc.
 - Keep medicines for people as well as animals.
 - Alert the officers related with road and rail divisions.
- ***In the most vulnerable regions display signboards covering the various important instructions to remember during emergency.***
- Have a good relationship with press, radio and television departments for announcement of flood warning at a regular interval.
 - Public relation officers should be made alert. Also request the social welfare societies, NGOs to be alert for any kind of emergency services.
 - Arrange training programmes on first aid, boating, swimming etc. for officers of different departments. Also keep them alert about their responsibilities.

What arrangements should be done during flood:

- Steps should be taken to move the direction floodwater to a different direction from any residential area.
- Dig drains so that the floodwater may flow immediately out of the affected area.
- Wherever possible make arrangement to pump out the floodwater from the affected area.

Relief and rescue operations required during and after the flood:

- Relief measures by non-official and voluntary organisations may be enlisted as far as possible.
- Shift the flood victims to safe places.
- Organise relief camps.
- Arrange places for feeding of the victims.
- Make arrangement of milk and medical treatment for the babies and children.
- Make arrangement of emergency medicines for the victims and the animals.
- Arrangement of vaccination for the animals.
- Arrangement of purified water for the flood victims.
- The relief camps should be made neat and clean.
- Arrangement of life jackets and motor boats for the relief operation.
- Be ready for sustained electricity in the flood-affected areas.
- Take steps for closing schools, different offices to be used as relief camps.

- To meet the shortage of milk, salt, mustered oil etc. open consumer care shops.
- Cleanse deep wells, ponds.
- Arrange medical camps for supply of anti- Cholera, - Gastroenteritis, -Typhoid, -Snake medicines and other relief measures.
- Continuously monitor the anti-social person who tries to take the advantage of flood situation and keep the law and order with the help of Police department.
- Arrange information centre, which will help people in finding out their lost ones and about the dead bodies.
- Make close cooperation with the different levels of officials.
- Making necessary arrangements for air dropping of food packets in the marooned villages through helicopters.
- Establish alternate communication links to have effective communication with marooned areas.
- Organising cattle camps, if necessary, and provide veterinary care, fodder and cattle feed to the affected animals.
- Take the help of N.S.S./N.C.C. and NGOs to supply the relief materials to the victims.
- Grant of emergency relief to the all affected people.
- Submission of daily reports and disseminate correct information through mass media to avoid rumours.
- Commencement of agricultural activities– desiltation, re-sowing.

Post flood measures adopted to bring normalcy

- Wherever possible, rehabilitate the people and animals.
- Assistance for repair/ rebuilding of private properties.
- Supply of food and emergency materials at an reasonable rate.
- Ensuring adequate supply of POL and kerosene oil and keeping the supply line moving.

- Normal water supply in the affected areas either by arranging tankers or fire tenders.
- Desilting and dewatering of the inundated properties.
- Arrangement of mobile medical team with sufficient medicines.
- Speedy restoration of roads, rail routes and the postal services.
- Repair of the power, telephone and sewerage lines on priority basis so that normalcy is restored.
- Repair of social institutions like damaged school buildings, hospitals etc. as well as restarting of service.
- The medicines and other flood damaged chemical materials should be removed.
- Steps should be taken immediately so that the health care centres reopen and can provide service to the common people.
- Taking up appropriate measures according to Contingency Plan for the agriculture sector.
- Make arrangement to establish cooperation among the different NGOs.
- Take steps so that the needy people get the relief materials.
- Monitor the situation and take special care to get help from the different social organisations / NGOs.
- Constitution of a survey team to assess the loss and compensation to be given to the affected people.
- Take steps to supply of relief materials at the standard considered by the administration.

Flood Control Measures:

The various measures adopted for flood mitigation may be categorised into two groups.

- (i) Structural (ii) Non-Structural

Structural:

The general approach was aimed at preventing floodwaters from reaching the potential damage centres, as a result of which a large number of embankments came up along the various flood prone rivers.

The main thrust of the flood protection programme undertaken in the country so far in the form of structural measures may be grouped into the following :

- Dams and Reservoirs
- Embankments, flood walls, sea walls
- Natural detection basin
- Channel improvement
- Drainage improvement
- Diversion of floodwater.

For effective functioning of all the physical measures taken, it is necessary that pre- and post- monsoon checks must be made and special repairs must be carried out prior to flood period.

Non-structural:

The non-structural measures, on the other hand, aim at modifying the susceptibility to flood damage as well as modifying the loss burden. The various non-structural measures being implemented in the country are:

(i) Modifying the susceptibility to flood damages through:

- Flood plain management
- Flood proofing including disaster preparedness, and response planning and
- Flood forecasting and Warning
- Watershed management.

(ii) Modifying the flood loss burden through:

- Disaster relief.
- Flood fighting including Public Health Measures

Setting up of flood forecasting and warning services is one of the most cost-effective non-structural measures available.

High Powered Committee on Disaster Management :

- ◆ ***Suggestions for removal of gaps/ constraints in the present system:***
 - ◆ There are areas where flood forecasting services, number of observation sites and forecasting stations may be increased.
 - ◆ Reservoirs should have reservoir regulation policy consistent with management of risk to the downstream areas.
 - ◆ Modern sensors and telemetry equipment, which can automatically record and transmit data, can be tried to areas prone to flash floods or for vital systems.
 - ◆ Integrate the forecasting/ warning with mitigation system.
 - ◆ Prepare inundation maps of flood prone areas.
 - ◆ Proper documentation of significant floods incidents.
 - ◆ All development activities in flood plains must be compatible with the flood risk involved.
- ◆ ***Future requirements in flood disaster mitigation:***
 - ◆ Satellite based remote sensing facilities available in the country are presently not used for best advantage in flood management/ disaster mitigation measures.
 - ◆ Better transport and communication facilities for the flood affected areas.
 - ◆ Making people aware of the flood risk through appropriate programmes.

- ◆ Imparting training keeping in view the requirements of functionaries at various levels and educate people living in the flood prone area.
- ◆ Traditional knowledge and wisdom be supported by scientific management measures for disaster mitigation efforts.
- ◆ Role of NGO and people's participation is an important aspect.
- ◆ Support from local media in organising disaster management activities.

The damaged caused by floods can at best be minimised and not altogether eliminated and the old-age philosophy of living with floods has to be adapted to the emerging situations with all the concomitant pressures of population and development. Activities.

References:

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