FLOODS

Flood is defined as the height or stage of water above some given point such as banks of a river channel.

India is the most flood affected nation after Bangladesh. Flood vulnerable area is ~40 million hectare. Average area affected 8 million hectre. Ave. annual damage is
~Rs. 9700 million. Annually 1500 human lives lost and one lac livestock dies.

Types of Flood:

a. Seasonal or cyclic flood (predicted flood):- eg. River and coastal flood during monsoon.

b. Random/infrequent/unpredicted flood. eg. Flash flood.

(flash floods are too much water in too little time due to accelerated run off and dam failure etc. Such floods occur within six hours during heavy rainfall).

c..Flood by human activity. e.g., urbanization, dam failure etc.

Causes of Flood:

a. Atmospheric effect- rain, cyclone, storm surges, snow melt etc.
b. Seismic- e.g. tsunami
c. Technological hazard
d. Deforestation

Predictability:

Seasonal flood can be predicted. Warning is possible well in advance. But only minutes before in the case of flash floods and tsunami.

Factors contributing to vulnerability:-

- Location of settlements on flood plains**.**
- Lack of awareness of flooding hazard
- Reduction of absorptive capacity of land.
- Non-resistant buildings and foundations.
- High risk infrastructural elements.
- Unprotected food stocks, standing crops, livestock
- Fishing boats and maintenance industries.

Typical Adverse Effects:-

- Overbank flooding and the entire flood plain inundation
- Human displacement
- Structural damage to housing, communicative and power supplies.
- Crop damage, soil erosion, stream bank erosion
- Flood water carry large amount of nutrients and productivity of ocean increased
- Death from drowning and serious injuries
- Possible outbreak of malaria, diarrhea, viral infections etc.
- Contamination of wells and groundwater

Flood Disaster Management:

Flood disaster management is classified into 4 major groups.

1. Attempts to modify the flood systems by taking physical measures like construction of embankments, detention reservoirs, channel improvement etc.

2. Attempts to modify the susceptibility to flood damage- this involves designed action to reduce the vulnerability of property and other developmental activities in the flood plain.

3. Attempts to modify the loss burden:- It consists of uniformity in action to transfer the incidence of losses by spreading them over a large segment of community.

4. The loss bearing:- means living with floods.

The possible risk reduction measures are further classified as:-

1. Structural approaches
2. Non-structural approaches
3. Pragamatic approaches

I. Structural approaches: (use engineering practice. i.e., flood abatement programe).

a. Construction of protective works like embankments (levees), flood wall, sea wall, dams, reservoirs etc.
b. Straitening and deepening of river channel
c. Providing a by –pass or additional flood channel past a danger center

d. Reduction in peak discharge (largest flow) by temporarily storing a portion of surface run off using dikes, dam thereby reducing the amount of run off.

II. Non-structural approaches:- (Administrative methods).

The various measures are as follows:

- Modifying the susceptibility to flood damages, flood plain management, disaster preparedness and response planning and flood forecasting and warning.

- Modifying the flood loss burden through disaster relief and flood fighting including public health measures, Flood mapping, flood insurance etc.

  Adjustment of human activity to accommodate the flood hazard. Simple method is to accept the loss and live with the flood.

III. Pragmatic Approaches:-

a. Select suitable cropping pattern and varieties tolerant to prolonged inundation
b. Recharge aquifer
c. Proper land management and afforestation
d. Inter-basin transfer

Specific Preparedness:

1. **By department concerned:**

- Premonsoon inspection of rail tracks, canals, drainage
- Regular clearance of the drainage for silt and weed.
- Regular maintenance of embankments, canals, distributaries
- Constitution of committees comprising district administration heads of emerging Services, police, medical etc

2.Community participation and education:-

3.Flood detection and early warning systems::- aims at forecasting of flood at the earliest possible point in time and it relies primarily on real-time estimation of rainfall over catchments and rainfall forecasting. Rainfall-Runoff modeling and River flow modeling (Flow routing models) are used. These models used to estimate present state of river basin and forecast future water levels and flows.

4.Developement of master plan for the plain management

Typical post-disaster needs:

Search and rescue, medical assistance, disaster assessment, short term food and water supplies, water purification, epidemiological surveillance, temporary shelter etc.

Impact Assessment Tools:

Damage survey forms, aerial surveys, aerial photos.