Management of Flood like Disasters

Introduction

- Floods are water related disaster
- A **flood** is an overflow of water that submerges land
- Flooding occurs due to overflow of water from water bodies, such as a river, lake, or ocean
- Flooding occurs when water overtops or breaks levees of water bodies
- Accumulation of rainwater on saturated ground also causes flooding
- Inflow of the tide also caused flooding in coastal areas
- Floods occurs in rivers when the flow rate exceeds the capacity of the river channel
- Floods often cause damage to homes, businesses, agricultural land and livestock if they are in the natural flood plains of rivers
- Additionally, floods can be local, impacting a neighborhood or community, or very large, affecting entire river basins
- Floods are an area of study of the discipline hydrology and are of significant concern in agriculture, civil engineering and public health
- Water resources management includes the management of flood like disasters

Causes of Floods

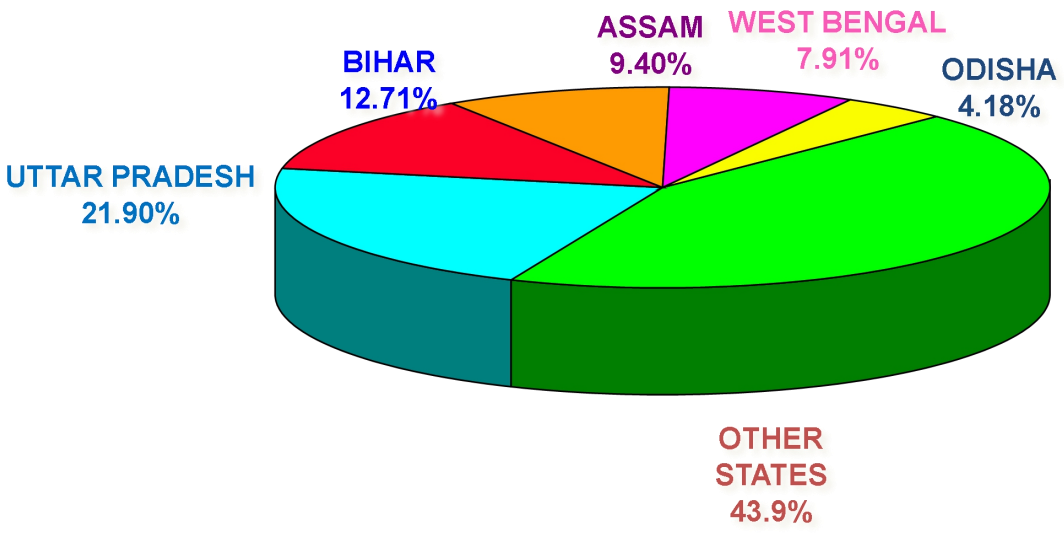
- Precipitation (Rainfall)
- Inadequate capacity (within banks)
- Bank erosion and silting
- Land slides
- Tidal and back water effects
- Poor drainage
- Snow melt and glacial out bursts
- Indiscriminate encroachment
- Increasing economic and developmental activities in flood plains
- Lack of regulations
- Inadequate drainage system
- Inadequate maintenance
- Lack of disaster preparedness

Flood Risks and Hazards

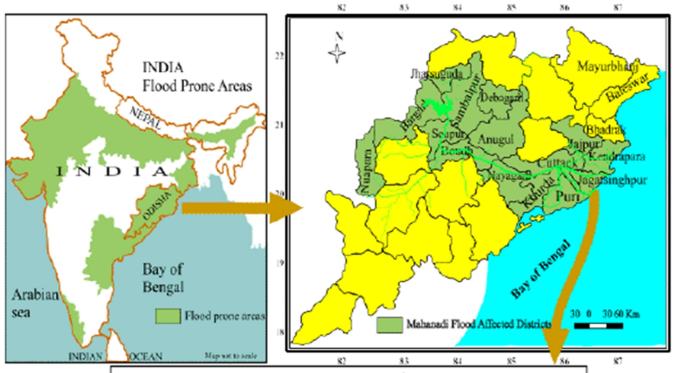
- Heavy rainfall exacerbates problems with:
- Runoff
- Absorption
- Flood-control measures
- Ravine flooding can inundate downstream areas
- In rocky and heavily paved areas, lack of absorption can cause flash flooding
- Most communities have some risk of flooding
- Damage increases with development in:
- Coastal areas
- Floodplains

Flood Prone Areas

- Total flood prone area in India - 40 million hectares
- It is about 12% of total geographical area of India

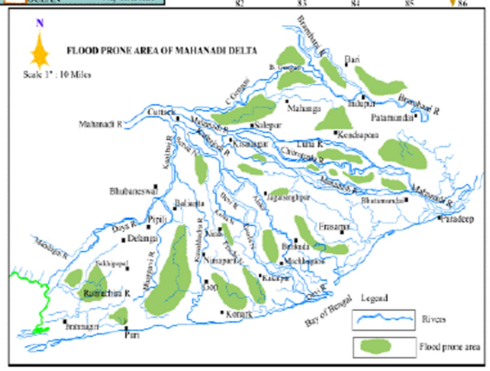


Flood Prone areas of India



Flood Prone Areas of Odisha

Flood Prone areas of Mahanadi River Delta in Odisha

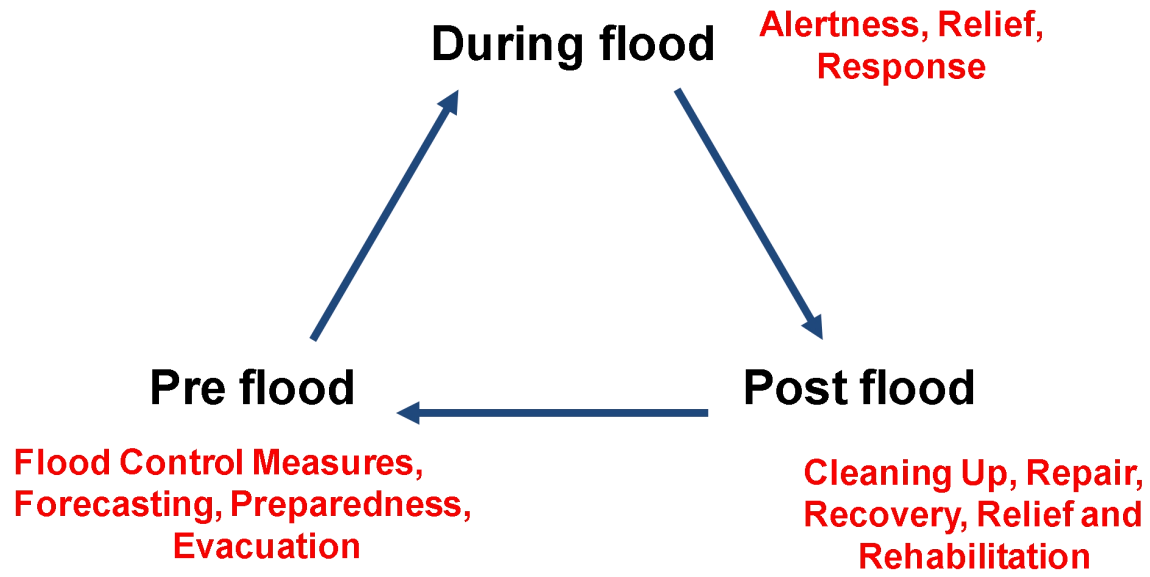


Flood safety planning

- Observation of previous and present flood heights and inundated areas
- Statistical, hydrologic, and hydraulic model analyses
- Mapping inundated areas and flood heights for future flood scenarios
- Long-term land use planning and regulation
- Engineering design and construction of structures to control or withstand flooding
- Intermediate-term monitoring, forecasting, and emergency-response planning
- Short-term monitoring, warning, and response operations

Flood Management

- Floods cannot be absolutely controlled
- Floods can only be managed to reduce flood losses



Flood Evacuation

- Do not walk, swim, or drive through flood waters
- Stay off bridges over fast-moving water
- Keep away from waterways
- Pay attention to barricades
- Avoid storm drains and irrigation ditches
- Keep family together

- Stay out of flooded areas
- Reserve telephone for emergencies
- Avoid driving, except in emergencies
- Wait for authorities to issue message that it is safe to return
- Be aware that snakes and other animals may be in your house

Flood Forecasting

STEPS

- Data collection
- Data transmission
- Data analysis & forecast formulation
- Dissemination of forecast

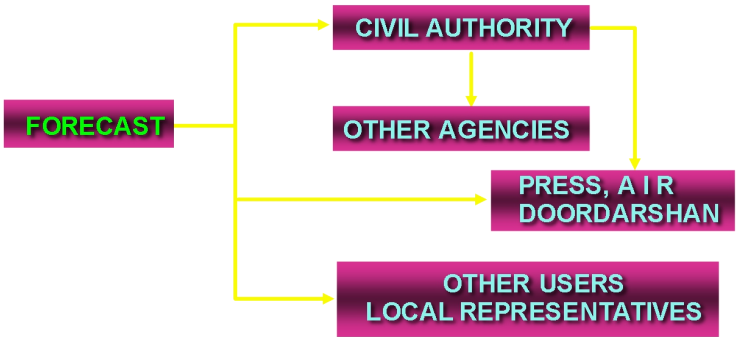
DATA TRANSMISSION

- Wireless
- Telephone
- Fax
- Satellite
- Telegraph
- Telex

DATA COLLECTION

- Hydrological
  - River water level
  - River discharge
- Hydrometeorolgical
  - Rainfall
  - Other Precipitation such as snow, hail etc.

DISSEMINATION



Flood Management

STRUCTURAL MEASURES

- Dams & reservoirs
- Embankment
- Channel improvement
- River diversion
- Inter basin transfer
- Anti erosion works

NON STRUCTURAL MEASURES

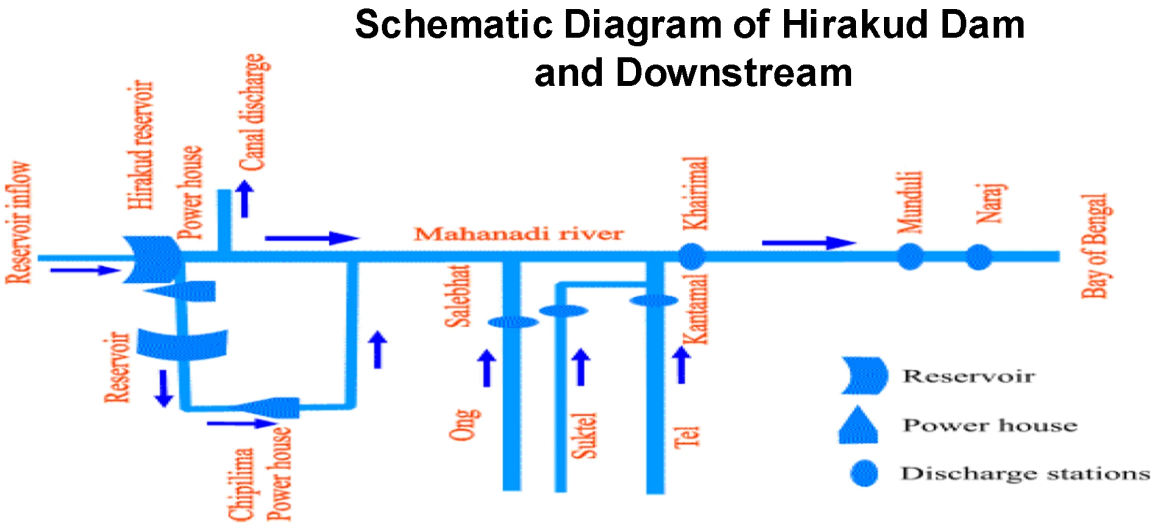
- Flood forecasting & warning
- Flood plain zoning
- Flood fighting
- Flood proofing
- Flood insurance
- Relief & rehabilitation

Flood Fighting Response

- Flood water management using water -level control structures such as dams and reservoirs
- Emergency repair and reinforcement of levees and embankments
- Emergency diversion of flood water via cut-through channels
- Temporary flood proofing using sandbags, cavity blocks etc.

Mahanadi Flood Management

- Hirakud dam regulates the flow of the Mahanadi River
- Prevents flood in the downstream
- Water from the dam is used for irrigation
- Generates hydroelectricity through several hydroelectric plants



Post Flood Recovery and Cleaning

- It is important to thoroughly wash and disinfect every part of your home that has been inundated by floodwaters
- Wash all surfaces that have been inundated to reduce the danger of flood related infections
- Boil all drinking water or drink bottled water only until supplies have been declared safe by health authorities.
- Use disinfectant when cleaning
- Mattresses soaked with flood water are difficult to salvage and should be discarded
- Do not use any electricity until you have had the power supply reconnected and have appliances checked by a qualified licensed electrician
- Disinfect refrigerators, freezers and dishwashers after they have been checked by an electrician

Examples of Deadliest floods

Death toll	Event	Location	Year
2,500,000–3,700,000	1931 China floods	China	1931
900,000–2,000,000	1887 Yellow River flood	China	1887
500,000–700,000	1938 Yellow River flood	China	1938
230,000	2004 Indian Ocean tsunami	Indonesia	2004
145,000	1935 Yangtze river flood	China	1935
100,000	Hanoi and Red River Delta flood	North Vietnam	1971
100,000	1911 Yangtze river flood	China	1911