

Flood Management - Part I

Why in news?

Recently, North India including Delhi witnessed heavy rainfall resulting in flood.

What is flood?

- Flooding is an *overflowing of water* onto land that is normally dry.
- **Types of Flood**
 - **Flash floods** - It is caused by rapid and excessive rainfall that raises water heights quickly, and rivers, streams, channels or roads may be overtaken.
 - **River floods** - It is caused when consistent rain or snow melt forces a river to exceed capacity.
 - **Coastal floods** - It is caused by storm surges associated with tropical cyclones and tsunami.

Urban flooding refers to the inundation of property in a built environment, particularly in more densely populated areas, caused by rain falling on increased amounts of impervious surfaces and overwhelming the capacity of drainage systems.

What are the causes of flooding?

- Flood is often caused by
 - **Natural causes** - Heavy rainfall, rapid snowmelt, storm surge from a tropical cyclone, tsunami in coastal areas, etc.
 - **Manmade causes** - Factors such as population growth, rapid urbanisation, increased developmental and economic activities in flood plains.

Meteorological Factors

- **Extreme rainfall** - It results in [flash flood](#) which is a cause of concern in low lying areas and urban cities where the damage inflicted is huge.
- **Sea surge** - Storm surge is caused by tropical cyclones where it causes sea water to overflow into coastal regions.
 - As per the Intergovernmental Panel on Climate Change (IPCC), it is estimated that before 2030, large parts of Kolkata could face immense flooding, causing the city to submerge.
- **Cloud Burst** - It occurs due to intense precipitation in a short duration which can sometimes be accompanied by hail and storm and can cause a flood.
 - **Example** - In 2022, several people were killed in the cloud burst and flash flood

incident in Himachal Pradesh and Uttarakhand.

- **Global Warming** - Due to the increased rise in global temperature, glaciers of the Himalayan range start to melt.
- As a result, the seawater level also rises, causing floods in surrounding years.
- **Earthquakes and Landslides** - A shift in tectonic plates can lead to alteration in the volume and course of surface water resulting in flood hazard.
 - **Example** - In 2013, heavy rain in Uttarakhand caused flood due to landslide and flash flood.

Physical Factors

- **Insufficient drainage management** - Due to this, areas are flooded by accumulation of water from heavy rainfall.
- **Change in river course** - Due to erosion of the banks, rivers change course and causes flood.
 - **Example** - Recent Yamuna flooding in Delhi 2023 one of the reason is change in river course.
- **Catchment area** - During monsoon, when excess water exceeds the limit of holding capacity of the catchment area (area from where the rainfall water flows into a river), it leads to floods.

Human Factors

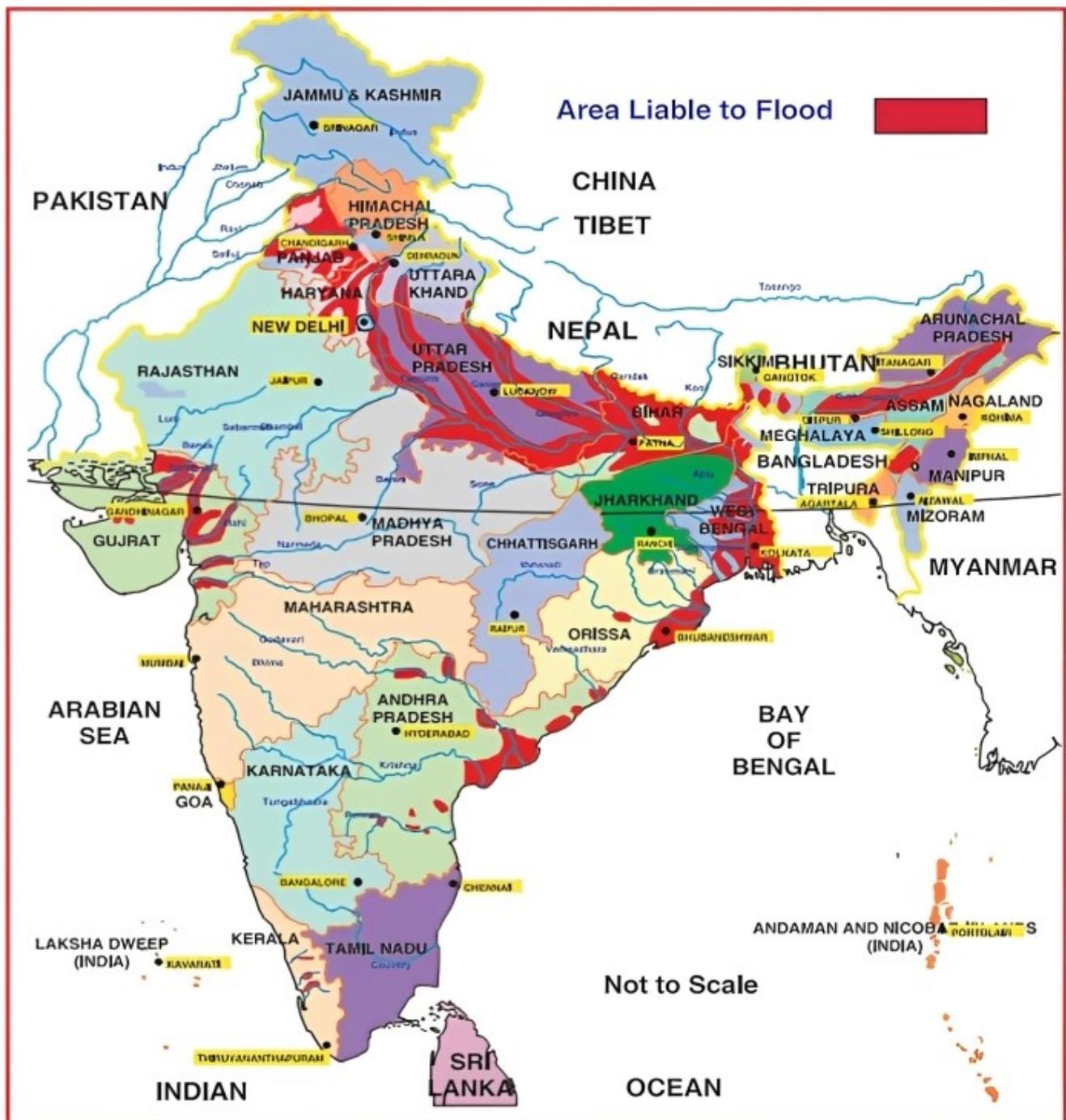
- **Siltation** - As particles remain suspended in the river and accumulated in the riverbed, it disrupts the flow of the river, causing a flood.
- **Improper Agricultural Practices** - Excessive irrigation applied to command areas and increase in ground water levels due to seepage from canals and irrigated fields lead to floods.
- **Deforestation** - Trees act like a sponge that helps to hold soil and water and prevent flooding.
- As trees are being cut down at a fast pace, more water runs towards a river during heavy rainfall and causes flood.
- **Collapse of Dams** - Dams are built to store water and provide water to people. As dams are human-made, these can be worn out and subsequently collapse causing floods.
 - **Example** - In 2018, Kerala flood is due to opening dam floodgate which is the worst flooding episode.
- **Floodplain encroachment** - This reduces the water carrying capacity of rivers which is brought from upper catchment areas and cause flooding.
 - **Example** - In 2015, Chennai was worst hit by floods, one of the reason is encroachment.

What zones in India are prone to flood?

- According to the estimate of the National Commission on Floods, the area prone to floods in the country is of the order of 400 lakh hectares.
- As per the Geological Survey of India (GSI), the major flood prone areas of India cover

almost 12.5% area of the country.

- The states falling within the periphery of "India Flood Prone Areas" are West Bengal, Orissa, Andhra Pradesh, Kerala, Assam, Bihar, Gujrat, Uttar Pradesh, Haryana and Punjab.
- The intense monsoon rains from southwest causes rivers like Brahmaputra, Ganga, Yamuna etc. to swell their banks, which in turn floods the adjacent areas.



To Know about Part-II - [Click Here](#).

References

1. [Indian Express| Prevent disruptions by flood](#)

2. [WHO| About Flood](#)
3. [NDMA| Flood Management in India](#)
4. [Indiawris| Flood Management](#)

