Flood Management – Part II

Why in news?

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

To Know about Part-I - Click Here.

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 affects the rainfall pattern?

- Extreme rainfall events are increasing both in intensity and frequency as climate change is heavily impacting the monsoon pattern in India.
- **Longer rainy season -** In recent times, rainfall in India is increasingly taking place in short, intense bursts.
- **Persistent warmer ocean currents** - Due to climate change oceans continue to remain warm even after the traditional monsoon season is over.
- **Global warming** - It is the reason for extreme rainfall events as the warm atmosphere can hold more water which may result in heavy downpour of rain.
- **Persistence of intense La-Nina -** It is further worsened by negative Indian Ocean dipole, warming of East Indian Ocean which results in prolonged monsoon.
- **Warming of Arabian Sea -** Due to global warming, temperature is 1.2–1.4 °C higher than the temperature witnessed four decades ago.
  - **Example**- In 2023 Gujarat witnessed heavy rainfall due to Cyclone Biparjoy which was formed in Arabian Sea.

What are the consequences?

- **Human loss and property loss -** Every year, millions of people become homeless and washed away due to floods.
- **Spread of communicable diseases -** Waterborne diseases (cholera, typhoid fever etc.,), vector-borne diseases (dengue, malaria etc.,) are caused during flood.
- **Impact on agriculture -** Floods destroy a large number of crops impacts the food security of the country. Livestock also gets displaced during floods.
- **Disruption of communication -** Flood damages transportation links such as bridges, rail, and power plants thus causing communication disruption.
- **Economic and social disruption -** The economy comes to a standstill as people are forced to move to another place.

What efforts were taken regarding flood management?

Government measures

- Flood management falls under the purview of ***State Government.***
- The Union Government supplements the efforts of the States by providing technical guidance and also promote financial assistance for management of floods in critical areas.
- **NDMA -** National Disaster Management Authority was set up in 2005 for prevention and mitigation effects of disasters including flood disasters.
- **Central Water Commission (CWC) -** It was set up in 1945 for achieving the goal of furthering and promoting measures of flood control, conservation and utilization of water resources.
- **Ganga Flood Control Commission -** It was set up in 1972 for preparation of comprehensive plan of flood control for Ganga Basin States
- **Brahmaputra Board -** The Government set up Brahmaputra Board under Brahmaputra Board Act, 1980 to survey and conduct investigations in Brahmaputra and Barak valley.
- **National Water Policy (2012) -** It suggested that through reservoir operation, the flood cushion can be set up to reduce the trapping of sediment during the flood season.
- **National Hydrology Project (2016) -** World Bank funded Central sector scheme which gathers hydro-meteorological data that will be stored and analyzed on a real-time basis.
- **Flood Management and Border Areas Program (2017-20) -** It is implemented for effective flood management, and soil and anti-sea erosion.

Engineering /Structural Measures

- **Dams -** Example - Idukki dam across river Periyar, Gandhi sagar dam across river Chambal etc.,
- **Dykes -** Dikes, also called levees, are earthen embankments that are raised parallel to the river flow at some suitable distance from the deep river.
- **Reservoirs -** Reservoir is formed upstream when a dam or a bund is built across a

river. Such a reservoir will store ample water that enters the river upstream of the dam.

Administrative / Non-structural Measures

- **Early warning system -** It will help in timely evacuation of people and movable property to safer grounds.
- **Flood plain zoning -** Flood-plain zoning measures aim at demarcating zones or areas likely to be affected by floods of different magnitudes or frequencies and probability levels.

What lies ahead?

- *National Flood Commission (Rashtriya Barh Ayog 1980)* had recommended solutions covering the entire gamut of the flood problem in the country like data collection, legislation enforcement, flood plain zoning etc.,
- Conducting monsoon audits regularly can mitigate the flood effects.
- Greening the cities is the need of the hour.
    - ***East Kolkata's wetlands*** have been an effective flood defence mechanism that help treat a large share of the city's sewage, produce half of the city's fresh vegetables.
- Adopt best practices from state like ***Tamilnadu,*** which is successful in implementing ***Rain Water Harvesting (RWH)*** structures.

References

1. Indian Express| Prevent disruptions by flood
2. WHO| About Flood
3. NDMA| Flood Management in India
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