What is Flood

A flood is when there is an excessive amount of water, and it covers the normally dry area. The word can also refer to the tide's inflow when used in the sense of "flowing water." It may cause dry areas to be completely submerged in water. It is a most common disaster that occurs mainly in tropical areas. Floods may occur when heavy rainfall or snowfall may lead large rivers to break their banks.

There are three typical flood types which are as follows:

- **Flash Floods:** Rapid and heavy rains can result in flash floods.
- **River floods:** They are brought on by persistent rain or snowmelt, which causes a river's capacity to be exceeded.
- **Coastal Floods:** Floods along the coast are brought on by storm surges brought on by tropical storms and tsunamis.

Two billion people worldwide have been impacted by floods between 1998 and 2017. Human encroachment and extensive human settlement are the main causes of floods. The amount of water in the waterways rises as a result. These are known for being somewhat slow to occur and reoccurring in well-known areas, particularly during monsoons.

Urban flooding occurs when rainfall exceeds the carrying capacity of drainage channels (such as storm sewers) and floods land or property within a developed environment. It happens particularly in more heavily populated areas. It is a situation with repeated and systemic effects on communities that can occur whether or not impacted communities are situated within recognized floodplains or close to any body of water, despite the fact that it can occasionally be caused by occurrences like flash floods or snowmelt.

Causes of Floods

During a flood, individuals must swiftly relocate to higher ground with their most valuable possessions. Evacuation is the procedure of fleeing houses in pursuit of a safe location. Floods vary in duration, size, and area affected and happen at unpredictable periods.

Naturally, water moves from high ground to low ground. Because of this, low-lying places will flood rapidly before the water reaches higher land. These can also happen when a river's capacity is exceeded by its flow rate, particularly near curves or meanders in the waterway. Businesses and homes are frequently damaged by floods if they are located in the natural flood plains of rivers.

Some of the major causes of floods include the following:

- **Rainfall:** Heavy rainfall is always a common cause of floods in Africa and Asia. Water overflows if there is more precipitation than the sewage system can handle.
- **River Overflow:** Floods can be caused by rivers overflowing their banks. This can occur when there is higher-than-normal upstream water flow, which causes a burst as it rushes downstream to the nearby low-lying areas. The result is that water enters the land. This

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- **Strong Coastal Winds:** Hurricanes and strong winds in coastal locations can carry seawater onto dry coastal lands and result in flooding. If the winds also carry rain, this gets worse. A tsunami's seawater aftereffects can occasionally move onshore and cause harm.
- **Breaking of Dams:** Dams are man-made constructions installed to retain water flowing from highlands to lowlands. Propellers are turned in order to produce electricity by harnessing the force of the water. The dam may occasionally burst due to too much water being kept back, causing an overflow to occur nearby. Floods may also be caused if extra water is purposefully discharged from the dam to keep it from collapsing.
- **Ice and snow melt:** In frigid climates, heavy winter snow typically remains unmelted for a while. On certain mountains, there is an ice cap. When the weather rises, the ice can sometimes abruptly melt, causing a large flow of water into normally dry areas. The term for this is snowmelt flood.

Effects of Floods

The tragic loss of life and the devastation of dwellings and other structures like sewage systems, bridges, canals, etc., are the direct effects of a flood. Along with the absence of drinking water purification and water supply, floods can also harm the transmission of power and, in some cases, power generation. Cholera, Typhoid and other illnesses may be present, depending on the area affected by the flood. This can be propagated due to the lack of clean water and the presence of human excreta in flood waters.

- Loss of human life - Excessive damage caused due to flood may result in loss of life. It may further also create health risks due to water contamination, and thus, the risks must be managed.
- Farmland is frequently inundated by flood waters, rendering it unusable and hindering the planting or harvesting of crops, which can result in food shortages for both people and farm animals.
- Extreme flood conditions can result in the loss of an entire country's harvest. Some tree species might not endure repeated root system inundation.
- Severe flooding frequently results in economic hardship because of a temporary drop in tourism, the expense of reconstruction, or supply shortages that raise food prices.

However, floods also have some beneficial effects:

- Floods every year leave fertile silt in farming areas, which is beneficial for the crops.
- The world's largest riverine island, Majuli in Assam, is the best illustration of successful paddy fields following the Brahmaputra's yearly floods.
- The marine population is balanced by introducing new prey and predators to the area.
- Groundwater recharging and naturally high productivity are benefits of the flood.

Distribution of Floods in India

Rashtriya Barh Ayog (National Flood Commission) has designated 40 million hectares of the land region as being at risk of flooding, and 23 of the country's states and union territories are flood-prone.

- Among the Indian states with the highest risk of flooding are Assam, West Bengal, and Bihar.
- In addition to these, the majority of the rivers in north India, including those in Uttar Pradesh and Punjab, are occasionally subject to flooding.
- States like Gujarat, Rajasthan, Punjab and Haryana have recently experienced flooding due to flash floods, it has been observed. This is due in part to the shifting patterns of the monsoon and in part to human activity-related blockage of most watercourses and river systems.
- Due to the retreating monsoon, Tamil Nadu occasionally experiences flooding between November and January.

Mitigation of Floods

Each flood-prone basin area should have a grand plan for management and control. If put into practice, the following ideas can aid in flood mitigation:

- To facilitate improved control, enough flood cushions must be included in water storage projects whenever practical.
- Even if it means forgoing certain irrigation or power gains, reservoir regulation policy in flood-prone areas must prioritise flood control.
- Increased emphasis should be placed on non-structural measures like prediction and warning, flood plain zoning, and floodproofing to reduce losses and to minimise the repeated expenditure on relief efforts, even though physical protection measures like embankments and dykes will still be required.
- To reduce the loss of property and life, rigorous guidelines on settlements and commercial activity in flood-prone regions must be implemented along with floodproofing.
- The forecasting events need to be updated, enhanced, and expanded to cover more unprotected areas.
- A Detailed Project Report (DPR) for the Flood Risk Mitigation Project has been assigned to NDMA.
- **Federal Flood Risk Reduction Program (NFRMP):** In addition to raising awareness among vulnerable groups, it tries to ensure that there are strategies in place to deploy the resources and skills for relief, rebuilding, rehabilitation, and recovery after calamities.
- **Flood Management Programme:** The FMP scheme was introduced by the Ministry of Jal Shakti during the 11th Plan era at an overall cost of 8000 crores (2007-12). The programme provides financial assistance to the state governments so they can control floods in places that need them most.

NDMA Guidelines on Flood Disaster Management

The following are the guidelines issued by the National Disaster Management Authority of India for flood disaster management:

Structural Measures:

- By constructing reservoirs, inspecting dams, and other structures to hold additional water in the event of a large discharge.
- Floodwater can be diverted to wetlands, man-made and natural channels, and other areas to lessen its effects.

- Walls and embankments serve as protection structures by preventing the overflowing of water into populated areas.
- Desilting and dredging operations boost the channel's carrying capacity and lessen spillage.
- Watershed management practices like tree planting is used in the catchment region to promote vegetation cover, decrease erosion and runoff, improve soil porosity, and deal with any abrupt surges.

Non-structural measures:

- Using floodplain zoning to control land use and lessen the damage. It entails actions like prohibiting occupancy along low-lying, regularly flood-prone areas, identifying the first locations that should be rescued during the disaster, and designating highlands where people should be relocated.
- Floodproofing can take the form of building shelters on high ground, assuring the availability of nourishment and fodder, protecting communication lines, and ensuring the uninterrupted delivery of medical services in the event of flooding.
- Depending on the geography, frequency, and population at risk, each government department and agency must create its own disaster control strategy.
- A government-sponsored programme by the NDMA called "Aapda Mitra" has been initiated to educate 200 local volunteers in 30 of the most flood-prone regions of the country to help with relief and rehabilitation. This is a step toward community involvement in flood mitigation.