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Topic: Floods: Causes and Consequences

What is flood?

Floods are the most frequent type of natural disaster and occur when an overflow of water submerges land that is usually dry (WHO). Floods are often caused by heavy rainfall, rapid snowmelt or a storm surge from a tropical cyclone or tsunami in coastal areas. Thus, inundation of land and human settlements by the rise of water in the channels and its spill-over presents the condition of flooding.

Generally, floods are considered to be associated with rivers and people conceive floods as the outcome of accumulation of huge volume of water coming out of the rivers through overtopping of river banks during peak discharge period. Flood is an attribute of physical environment and thus, is a component of the hydrological cycle of a drainage basin. It may be pointed out that floods are natural phenomenon and are a response to rainfall but it **becomes hazard** and **disaster** when it causes colossal loss to human lives and property. Noteworthy that, floods are also aggravated by human activities and thus, flood hazard is both natural as well as human-induced phenomenon.

Floods can cause widespread devastation, resulting in loss of life and damages to personal property and critical public health infrastructure. Between 1998-2017, floods affected more than 2 billion people worldwide. People who live in floodplains or non-resistant buildings, or lack warning systems and awareness of flooding hazard, are most vulnerable to floods.

Types of floods

Generally, floods are classified into the following three types:

1) Land-borne floods or river floods
2) Coastal floods or storm surge flooding
3) Local water logged flooding

Causes of floods

Unlike other natural disasters, the causes of floods are well-established. Floods are relatively slow in occurrences and often, occur in well-identified regions and within expected time in a year. Floods occur commonly when water in the form of surface run-off exceeds the carrying capacity of the river channels and streams and flows into the neighbouring low-lying flood plains. At times, this even goes beyond the capacity of lakes and other inland water bodies in which they flow. Floods can also be caused due to a storm surge (in the coastal areas), high intensity rainfall for a considerably longer time period, melting of ice and snow, reduction in the infiltration rate and presence of eroded material in the water due to higher rate of soil erosion. Though floods occur frequently over wide geographical area having disastrous ramifications in many parts of the world, floods in the South, Southeast and East Asian countries, particularly in China, India and Bangladesh, are frequent and equally disastrous.

Fig.: Flood hazard zones

Once again, unlike other natural disasters, human beings play an important role in the genesis as well as spread of floods. Indiscriminate deforestation, unscientific agricultural practices, disturbances along the natural drainage channels and colonization of flood-plains and river-beds are some of the human activities that play an important role in increasing the intensity, magnitude and gravity of floods.

Various states of India face heavy loss of lives and property due to recurrent floods. *Rashtriya Barh Ayog* (National Flood Commission) identified 40 million hectares of land as flood-prone in India. The Figure shows the flood-affected areas in India. Assam, West Bengal and Bihar are among the high flood-prone states of India. Apart from these, most of the rivers in the northern states like Punjab and Uttar Pradesh, are also vulnerable to occasional floods. It has been noticed that states like Rajasthan, Gujarat, Haryana and Punjab are also getting inundated in recent decades due to flash floods. This is partly because of the pattern of the monsoon and partly because of blocking of most of the streams and river channels by human activities. Sometimes, Tamil Nadu experiences flooding during November- January due to the retreating monsoon.

Thus, the following **causes of floods** can be traced out.

1) Heavy incessant rainfall
2) Spell of extremely heavy rainfall
3) Highly sinuous and meandering courses of rivers
4) Large-scale deforestation
5) Increased urbanization
6) Faulty agricultural practices
7) Blocking of natural flow of water

Consequences of floods

Frequent inundation of agricultural land and human settlement, particularly in Assam, West Bengal, Bihar and Eastern Uttar Pradesh (flooding rivers), coastal areas of Orissa, Andhra Pradesh, Tamil Nadu and Gujarat (cyclone) and Punjab, Rajasthan, Northern Gujarat and Haryana (flash floods) have serious consequences on the national economy and society. Floods do not only destroy valuable crops every year but these also damage physical infrastructure such as roads, rails, bridges and human settlements. Millions of people are rendered homeless and are also washed down along with their cattle in the floods. Spread of diseases like cholera, gastro-enteritis, hepatitis

and other water-borne diseases spread in the flood-affected areas. However, floods also make a few positive contributions. Every year, floods deposit fertile silt over agricultural fields which is good for the crops. Majuli (Assam), the largest riverine island in the world, is the best example of good paddy crops after the annual floods in Brahmaputra. But these are insignificant benefits in comparison to the grave losses.

The Government of India as well as the state governments are well aware of the menace created by floods every year. Construction of flood protection embankments in the flood-prone areas, construction of dams, afforestation and discouraging major construction activities in the upper reaches of most of the flood-creating rivers, etc. are some steps that need to be taken up on urgent basis. Removal of human encroachment from the river channels and depopulating the flood plains can be the other steps. This is particularly true in western and northern parts of the country which experience *flash-floods*. Cyclone centres may provide relief in coastal areas which are hit by a storm surge.

Word Scenario

Drowning accounts for 75% of deaths in flood disasters. Flood disasters are becoming more frequent and this trend is expected to continue. Drowning risks increase with floods particularly in low- and middle-income countries where people live in flood prone areas and the ability to warn, evacuate, or protect communities from floods is weak or only just developing. Deaths also result from physical trauma, heart attacks, electrocution, carbon monoxide poisoning or fire associated with flooding. Often, only immediate traumatic deaths from flooding are recorded.

Floods can also have **medium**- and **long-term** health **impacts**, including:

- water- and vector-borne diseases, such as cholera, typhoid or malaria
- injuries, such as lacerations or punctures from evacuations and disaster cleanup
- chemical hazards
- mental health effects associated with emergency situations
- disrupted health systems, facilities and services, leaving communities without access to health care
- damaged basic infrastructure, such as food and water supplies, and safe shelter.

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