Floods

August 6, 2019

Manifest pedagogy:

Floods as part of geography and disaster management could be asked in mains. Large parts of India being affected by floods year after year, it could be and important area of preparation for upcooming mains

In news:

- Different parts of India are affected by heavy rains and floods

Placing it in syllabus:

- Disaster and disaster management

Static dimensions:

- What is a flood
- Causes of floods in India

Current dimensions:

- Regions affected by floods in India
- Measures to tackle floods

Content:

Flooding is an overflowing of water onto land that is normally dry. Floods can happen during heavy rains, when ocean waves come on shore, when snow melts too fast, or when dams or levees break. Floods are the most common and widespread of all weather-related natural disasters

Flash floods are the most dangerous kind of floods, because they combine the destructive power of a flood with incredible speed and unpredictability. Flash floods occur when excessive water fills normally dry creeks or river beds along with

currently flowing creeks and rivers, causing rapid rises of water in a short amount of time. They can happen with little or no warning.

Densely populated areas are at a high risk for flash floods. The construction of buildings, highways and parking lots increases runoff by reducing the amount of rain absorbed by the ground. This runoff increases the flash flood potential.

Sometimes, streams through cities and towns are routed underground into storm drains. During heavy rain, the storm drains can become overwhelmed and flood roads and buildings. Low spots, such as underpasses, underground parking garages, and basements can become death traps.

Areas near rivers are at risk from flash floods. Dam failures can send a sudden destructive wall of water downstream. Mountains and steep hills produce rapid runoff , which causes streams to rise quickly. Rocks and clay soils do not allow much water to infiltrate the ground. Saturated soil also can lead rapidly to flash flooding.

A deep snowpack increases runoff produced by melting snow. Heavy rains falling on melting snowpack can produce disastrous flash flooding. Thick layers of ice often form on streams and rivers during the winter. Melting snow and/or warm rain running into the streams may lift and break this ice, allowing large chunks of ice to jam against bridges or other structures. This causes the water to rapidly rise behind the ice jam. If the water is suddenly released, serious flash flooding could occur downstream.

Causes of floods in India:

The most common cause of flooding is the incapability of watercourses to drain away water during an unusually heavy rainfall. Floods however, are not always caused by heavy rainfall. They can result from other natural or man-made phenomena. For instance, inundation in coastal areas can be

caused by a storm surge associated with a tropical cyclone, a tsunami or a high tide, Inundation of normally dry areas can be caused by dam failure, triggered for example by an earthquake.

The peculiar nature of India’s climate, dominated by monsoons, causes situations where drought and floods may affect different pockets at the same time of year. The main reasons for floods in India are:

1. Heavy concentrated rainfall
2. Cyclone and strong winds, and
3. Inadequate drainage

Overgrazing, especially in the foothills, leaves the soil without cover and therefore vulnerable to erosion. Unscientific farming practices like shifting cultivation result in loss of vegetation cover and consequent soil erosion.

Indiscriminate deforestation in catchment areas and upper reaches leads to soil erosion. This in turn causes silting of river courses downstream. A thinned soil cover also results in reduction of infiltration and consequent increase in runoff of large volumes of water.

Regions affected by floods:

The Brahmaputra River Region:

This region consists of the rivers Brahmaputra and Barak and their tributaries, and covers the states of Assam, Arunachal Pradesh, Meghalaya, Mizoram, Manipur, Tripura, Nagaland, Sikkim and the northern parts of West Bengal. The catchments of these rivers receive very heavy rainfall and hence floods in this region are severe and quite frequent.

Further the hills, where these rivers originate, are fragile

and susceptible to erosion and thereby cause exceptionally high silt discharge in the rivers. In addition, the region is subject to severe and frequent earthquakes, which cause numerous landslides in the hills and upset the regime of the rivers.

The Ganga River Region:

The river Ganga and it's tributaries cover the states of Uttarakhand, Uttar Pradesh, Jharkand, Bihar, south and central parts of West Bengal, Punjab, parts of Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh and Delhi. Most of the damage by floods is caused by the northern tributaries of the Ganga. They spill over their banks and change their courses frequently.

In general, the flood problem increases from the west to the east and from south to north. In recent years, the states of Rajasthan and Madhya Pradesh have also experienced some incidents of heavy floods. The problem of flooding and drainage congestion is getting accentuated due to large-scale encroachment of flood plains of the rivers for habitation and various developmental activities.

The North-west River Region:

The Indus and its tributaries carry quite substantial discharges during the monsoon and also large volumes of sediment. They change their courses frequently and leave behind vast tracts of sandy waste. This region covers the states of Jammu and Kashmir, Punjab and parts of Himachal Pradesh, Haryana and Rajasthan. Indiscriminate use of water for irrigation and development of low-lying areas and depressions has created problem of drainage congestion and water logging over vast areas.

The Central India and Deccan Region:

Important rivers in this region are the Narmada, Tapi,

Mahanadi, Godavari, Krishna and Cauvery. These rivers have mostly well defined and stable courses. This region covers the states of Andhra Pradesh, Karnataka, Tamil Nadu, Kerala, Orissa, Maharashtra, Gujarat and parts of Madhya Pradesh. The region does not have serious flood problem except that some of the rivers in Orissa State namely Mahanadi, Brahmini, Baitarni, and Subarnarekha are prone to floods every year.

The delta and coastal areas of the states on the east coast periodically face flood and drainage problems in the wake of monsoon depression and cyclonic storms. The problem is accentuated when the floods synchronize with high tide. The rivers Tapi and Narmada, are occasionally in high floods affecting areas in the lower reaches in Gujarat.

Floods in India -2019:

On 10 June 2019, Tropical Cyclone VAYU formed over the eastern Arabian Sea (Indian Ocean) started moving north towards Maharashtra. In anticipation for the tropical cyclone, NDRF evacuated over 270,000 people from coastal areas in Gujarat. On 17 June, the Depression was weakened into a well marked low pressure area.

Since then, heavy rains and floods have affected most part of Assam. The Assam government has issued a red alert as the flood situation turned extremely critical, displacing tens of thousands and cutting off entire portions of the state. Thousands of people have been moved to relief camps in Assam after flooding caused by the overflowing Brahmaputra, Barak and Jia Bhoreli rivers. Relief distribution centres are in operation.

Forest officials have said that 95 per cent of the Kaziranga National Park – home to the endangered one-horned rhino, has been flooded and cases of death of wild animals have been recorded. Animals are seen emerging out of the park to escape drowning.

As of now, around 150,000 people are seeking temporary shelters at camps in different states set up by the Government of India. Thousands of fatalities and injuries have been recorded across Assam, Bihar, UP, Tripura, Kerala, Mizoram, Rajasthan and Maharashtra states.

Approximately 33,800 houses have been reportedly destroyed in Assam, Kerala and Rajasthan.

As of 2 August, fatalities have been reported in in Vadodara City (Gujarat State), and over 5,700 evacuated. Most parts of Vadodara remain inundated and many houses have been damaged, as Vishwamitri river breached its banks and flooded the area. Several crocodiles from Vishwamitri river have ventured in waterlogged residential areas of Vadodara City. Heavy to very heavy rainfall and strong winds will continue to affect Gujarat State.

However the flood level is receding in Assam and Bihar and health authorities are concerned that there is the risk of a vector-borne disease outbreak, like dengue and Encephalitis.

Flood management:

The flood management mechanisms in India at the moment is operational at two levels – central level and state level.

The state level mechanism is made up of the water resource department, the Flood Control Board, State Disaster Management Authority (SDMA), State Technical Advisory Committee. The central level mechanism is made up of bodies such as the Central Water Commission (CWC), the Farakka Barrage Project Authority, the Ganga Flood Control Commission, the National Disaster Management Authority (NDMA) and the Brahmaputra Board

Other initiatives in order to deal with floods include:

- Policy Statement 1954

- Policy Statement of 1958
- High Level Committee on Floods, 1957
- National Flood Commission, 1980
- Expert Committee to Review the Implementation of the Recommendations of National Flood Commission – 2003 (R Rangachari Committee)
- National Water Policy (1987/2002/2012)
- NDMA Act, 2005

The flood management measures that are being used in India can be broadly classified into engineering or structural measures and administrative or non-structural measures. The engineering measures comprise the following:

- Reservoirs
- Drainage improvement
- Embankments
- Diversion of flood waters
- Channelization of rivers
- Watershed management
- Channel improvement

Some methods of flood control have been practiced since ancient times. These methods include planting vegetation to retain extra water, terracing hillsides to slow flow downhill, and the construction of floodways. Other techniques include the construction of levees, lakes, dams, retention ponds to hold extra water during times of flooding.

The administrative measures include flood plain zoning and flood proofing