Flash Floods and Landslides

Published On: 26-06-2023

Why in News:

The Chandigarh-Manali highway was blocked recently following flash floods and landslides in parts of Haryana and Himachal Pradesh.

More about Flash floods

Flash floods were witnessed in Khotinallah near Aut (in HP) on the Pandoh–Kullu stretch due to a heavy downpour and the commuters have been stranded as a result.

Moderate to heavy rains have also lashed several parts of Kangra, Mandi and Sirmaur districts. The Indian Meteorological Department (IMD) added that there was no warning for flash floods. But flash floods are not simply a situation of excessive rains, there are certain criteria for terming rains as such.

About Flash floods

Excessive or continuous rainfall over a period of days, or during particular seasons, can lead to stagnation of water and cause flooding.

Flash floods refer to such a situation, but occurring in a much shorter span of time, and are highly localised.

For instance, the US's meteorological agency, the National Weather Service, says flash floods are caused when rainfall creates flooding in less than 6 hours.

It adds that flash floods can also be caused by factors apart from rainfall, like when water goes beyond the levels of a dam.

Causes of Flash floods

In India, flash floods are often associated with cloudbursts – sudden, intense rainfall in a short period of time. Himalayan states further face the challenge of overflowing glacial lakes, formed due to the melting of glaciers, and their numbers have been increasing in the last few years.

Frequently, flash floods are accompanied by landslides, which are sudden movements of rock, boulders, earth or debris down a slope.

It is common in mountainous terrains, where there are conditions created for it in terms of the soil, rock, geology and slope.

Natural causes that trigger landslides include heavy rainfall, earthquakes, snowmelting and undercutting of slopes due to flooding.

Landslides can also be caused by human activities, such as excavation, cutting of hills and trees, excessive infrastructure development, and overgrazing by cattle.

India is one of the countries most likely to face landslides.

Flash flooding commonly happens more where rivers are narrow and steep, so they flow more quickl

They can occur in urban areas located near small rivers, since hard surfaces such as roads and concrete do not allow the water to absorb into the ground.

Frequency of Flood and Flash floods in India

According to government data from a project by the Assam State Disaster Management Authority, India is the worst flood-affected country in the world, after Bangladesh, and accounts for one-fifth of the global death count due to floods.

Flash floods have been commonly witnessed in cities like Chennai and Mumbai. Depression and cyclonic storms in the coastal areas of Orissa, West Bengal, Andhra Pradesh, and others also cause flash floods.

Further, data from the National Disaster Management Authority (NDMA) states that one of the reasons for flood situations occurring so frequently is that nearly 75 per cent of the total Indian rainfall is concentrated over a short monsoon season of four months (June to September).

As a result, the rivers witness a heavy discharge during these months. About 40 million hectares of land in the country are liable to floods according to the National Flood Commission, and an average of 18.6 million hectares of land are affected annually.

Flash floods may in the future, begin to take place after wildfires that have been taking place more frequently. This is because wildfires destroy forests and other vegetation, which in turn weakens the soil and makes it less permeable for water to seep through.

Suggested measures

Flash floods can be devastating and pose a significant threat to life and property. While it is not possible to completely control flash floods, there are several methods that can help mitigate their impact and reduce the risk they pose. Here are some approaches to controlling flash floods:

1Early Warning Systems: Implementing an effective early warning system is crucial for flash flood control. This involves monitoring weather conditions and river levels in real-time, and issuing timely warnings to communities at risk. These warnings can help people evacuate to safer areas and take necessary precautions.

2Floodplain Zoning and Land Use Planning: Proper land use planning is essential to minimize the impact of flash floods. Identifying flood-prone areas and implementing zoning regulations to restrict or control development in these zones can help prevent or reduce damage to infrastructure and property.

3Reforestation and Afforestation: Trees and vegetation play a crucial role in controlling flash floods. They help absorb rainfall, reduce surface runoff, and stabilize the soil. Initiatives focused on reforestation and afforestation can help increase the natural capacity of an area to handle heavy rainfall and reduce the occurrence and intensity of flash floods.

4Channel Modification and Flood Control Structures: Modifying river channels and constructing flood control structures can help manage the flow of water during flash flood events. These structures may include dams, reservoirs, levees, and flood walls, which can store excess water and redirect or slow down the flow, reducing the risk of downstream flooding.

5Stormwater Management: Effective stormwater management practices can reduce the risk of flash floods in urban areas. This involves the construction of drainage systems, retention ponds, and green infrastructure (such as rain

gardens and permeable pavements) to capture and slow down rainfall, allowing it to be gradually released into water bodies.

6Education and Awareness: Educating communities about flash floods, their causes, and the appropriate actions to take during an event is essential. Public awareness campaigns can help people understand the risks, promote preparedness, and encourage the adoption of safe practices.

7International Cooperation: Flash floods often affect large areas and cross jurisdictional boundaries. International cooperation and information sharing among countries can be crucial for effective flash flood control, especially in regions prone to such events.

The Way Ahead

It is important to note that while these methods can help mitigate the impact of flash floods, the inherent unpredictability and intensity of such events mean that prevention and control efforts must be complemented with emergency response and evacuation plans to ensure the safety of affected communities.