Monsoon and Disasters

October 26, 2021
Even as the southwest monsoon began to retreat from the subcontinent, Kerala and Uttarakhand received record rainfall in October. In both these States and others, over the last few years, there have been variations in the pattern and intensity of rainfall. Kerala had seen a severe spell in 2018, which caused havoc. This year's rain, too, claimed lives in Kerala and Uttarakhand.

In news: Why is India facing bouts of extreme weather?
Placing it in syllabus: Disaster Management
Dimensions

- Pattern of Southwest monsoon and its retreat
- The plethora of disasters since 2013 from Himalayas to Western Ghats
- Factors behind disasters related to monsoon
- Long term solutions

Content:

Pattern of Southwest monsoon and its retreat:

- A monsoon is a seasonal change in the direction of the prevailing, or strongest, winds of a region.
- They cause wet and dry seasons throughout much of the tropics and are most often associated with the Indian Ocean.
- The summer monsoon and the winter monsoon determine the climate for most of India and Southeast Asia.
- The summer monsoon or South West Monsoon is associated with heavy rainfall. It usually happens between June and September.
- As winter ends, warm, moist air from the southwest Indian Ocean blows toward the Indian subcontinent.

- The summer monsoon brings a humid climate and torrential rainfall to these areas.
- India and Southeast Asia depend on the summer monsoon. Agriculture, for example, relies on the yearly rain.
- Many areas in these countries do not have large irrigation systems surrounding lakes, rivers, or snowmelt areas. The summer monsoon fills wells and aquifers for the rest of the year.
- A great deal of electricity in the region is produced by hydroelectric power plants, which are driven by water collected during the monsoons
- When the summer monsoon is late or weak, the regions economy suffers.
- The summer monsoon has been called India's true finance minister.

Retreat of Monsoon

- The Indian Oceans winter monsoon, which lasts from October to April, is less well-known than its rainy summer equivalent.
- The dry winter monsoon blows from the northeast.
- These winds start in the air above Mongolia and northwestern China.
- Winter monsoons are less powerful than summer monsoons in Southeast Asia, in part because the Himalaya Mountains prevent much of the wind and moisture of the monsoons from reaching the coast.
- The Himalayas also prevent much of the cool air from reaching places like southern India and Sri Lanka, keeping them warm all year.

The plethora of disasters since 2013 from Himalayas to Western Ghats

2013 Cloudburst in Uttarakhand:

- In June 2013, a mid-day cloudburst centered on the North

Indian state of Uttarakhand caused devastating floods and landslides, becoming the country's worst natural disaster since the 2004 tsunami.

- The rainfall received that month was far greater than the rainfall the state usually received.
- Debris blocked the rivers, causing major overflow.

The 2015 South India floods

- They resulted from heavy rainfall generated by the annual northeast monsoon in November–December 2015.
- They affected the Coromandel Coast region of the South Indian states of Tamil Nadu and Andhra Pradesh.
- More than 500 people were killed and over 1.8 million (18 lakh) people were displaced
- The unusually heavy rainfall in southern India during the winter of 2015 has been partly attributed to the 2014–16 El Niño event.
- In July 2018 the Comptroller and Auditor General of India (CAG) categorised the flooding across Tamil Nadu as a "man-made disaster", and held the Government of Tamil Nadu responsible for the scale of the catastrophe

2018 Kerala floods

- On 16 August 2018, severe floods affected the south Indian state Kerala, due to unusually high rainfall during the monsoon season.
- It was the worst flood in Kerala in nearly a century with all 14 districts of the state placed on red alert.
- According to the Kerala government, one-sixth of the total population of Kerala had been directly affected by the floods and related incidents.
- The Indian government had declared it a Level 3 Calamity, or "calamity of a severe nature".
- It is the worst flood in Kerala after the great flood of 99 that took place in 1924.
- Heavy rains in Wayanad and Idukki had caused severe

landslides and have left the hilly districts isolated

2021 Kerala / Uttarakhand floods

- Even as the southwest monsoon began to retreat from the subcontinent, Kerala and Uttarakhand received record rainfall in October.
- In both these States and others, over the last few years, there have been variations in the pattern and intensity of rainfall.
- According to the India Meteorological Department (IMD), the Kerala and Mahe region received 124% excess rainfall from October 14 to October 20.

Factors behind disasters related to monsoon

Monsoon-induced disasters, predominantly landslides and floods, are common geological hazards triggered by torrential rainfalls during the rainy season.

Vagaries of Climate Change:

- This year, India was poised to receive below normal rainfall until August when global meteorological factors changed and caused a torrential September that largely repaired the monsoon deficit.
- However, the vagaries in climate reveal their impact in the damage that they cause and the latter is due to society’s environmental choices.
- there is a broad agreement that warming oceans are contributing to intense spells of rainfall in pockets followed by long rainless spells, specific instances

Hilly topography:

- Kerala and Uttarakhand have large tracts of hilly terrain that are prone to landslips.

Deforestation:

- Deforestation causes the acceleration of runoff and lowering of infiltration.
- Deforestation of hill slopes leads to greater run-off which raises the water level in rivers flowing from Western Ghats, Siwaliks and Chotanagpur plateau region.

Obstruction of free-flow of rivers:

- Embankments, railways, canals etc. obstruct the free flow of rivers leading to flood.

Inadequate drainage arrangement:

- After introduction of irrigation in some areas, the sub-soil water table rises fast unless adequate arrangement are simultaneously made for both surface and sub-surface drainage eg. Punjab, Haryana and Uttar Pradesh.

Unscientific / haphazards Construction:

- Unprecedented destruction of rainfall witnessed in Uttarakhand state was also attributed, by environmentalists, to unscientific developmental activities undertaken in recent decades contributing to high levels of loss of property and lives.
- Roads constructed in haphazard style, new resorts and hotels built on fragile river and more than 70 hydroelectric projects in the watersheds of the state led to a “disaster waiting to happen” as termed by certain environmentalists.
- The environmental experts reported that the tunnels built and blasts undertaken for the 70 hydro electric projects contributed to the ecological imbalance in the state, with flows of river water restricted and the streamside development activity contributing to a higher number of landslides and more flooding
- One estimate by researchers in 2017 put quarrying area in Kerala at over 7,157 hectares, much of it in central districts that were hit later by mudslides.

A study by Utah State University analyzed the natural and anthropogenic influences on the climate anomalies using simulations, and found that

- (a) northern India has experienced increasingly large rainfall in June since the late 1980s,
- (b) the increase in rainfall appears to be associated with a tendency in the upper troposphere towards amplified short waves, and
- (c) the phasing of such amplified short waves is tied to increased loading of green-house gases and aerosols.

In addition, a regional modeling diagnosis attributed 60–90 % of rainfall amounts in the June 2013 event to post-1980 climate trends.

Long Term solutions:

- The precarity of living conditions in much of the country make the annual monsoon a persistent threat for millions, and governments should do more to reduce the risk to life and property.
- Nurturing the health of rivers and keeping them free of encroachments, protecting the integrity of mountain slopes by ending mining, deforestation and incompatible construction hold the key.
- Landslides cannot be fully prevented but there are ways to secure people’s lives against them. One way is identifying and relocating human settlements in hilly and mountainous areas vulnerable to landslides.
- The ecological imperative should be clear to Kerala with successive years of devastation, echoing the warnings in the Madhav Gadgil committee report on the Western Ghats.
- Land may be an extremely scarce resource, but expanding extractive economic activity to montane forests is certain to cause incalculable losses.

- It should be evident to governments that it is unconscionable to allow the pursuit of short-term profits at the cost of helpless communities.
- A more benign development policy should treat nature as an asset, and not an impediment. Accurately mapped hazard zones should inform all decisions.
- There is a similar threat from extreme weather, breaking glaciers and cloudbursts to Uttarakhand and Himachal Pradesh.
- Several States face climate change impacts and extreme weather, and the response must be to strengthen natural defences.

Mould your thought: Discuss the reasons behind the increased disasters related to Monsoon in India? What can be done in the long run to avoid such events?

Approach to the answer:

- Introduction
- Give examples to show monsoon related disasters have become frequent
- Mention the reasons for these disasters
- Discuss the long term solutions
- Conclusion