



Changing Rainfall Pattern in North East India

Why in News

Recently, an analysis showed a changing rainfall pattern in North East (NE) India because of [Climate Change](#).

- The [National Action Plan on Climate Change \(NAPCC\)](#) was launched in 2008 by the Prime Minister's Council on Climate Change. It identifies measures that promote India's development objectives while also yielding co-benefits for addressing climate change effectively.

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Key Points

- **About:**
 - NE normally receives **heavy rainfall** during the [Monsoon](#) months (June-September), but has **changed its course in recent years**.

- The rains come in quick bursts and **Flood** the region, followed by **elongated dry periods** that border on **drought**.
 - A research paper published in 2018 found that the **monsoon rainfall in NE decreased by 355 mm between 1979 and 2014**.
 - Out of this, 30-50 mm decrease was due to **a reduction in local Moisture levels**.
- Because of its unique topology and steep slopes suddenly giving way to plains, the region is **prone to river course changing**.
 - NE is mostly hilly and is an **extension of the Indo-Gangetic Plains**, the region is **highly sensitive to changes in regional and global climate**.
 - Pre-monsoon and monsoon are the rainy seasons of northeast India.
- In most of the NE states the rainfall during monsoon has **declined in two decades** below the **Long Period Average (LPA)**.
- The **number of rainy days decreased** in most districts to the north of the **Brahmaputra**.
 - This means that increased rainfall now happens over fewer days, increasing chances of river flooding.

▪ **Factors Causing Rainfall Patterns Change:**

◦ **Moisture and Drought Together:**

- An aspect of warming that influences rainfall is **drying of the land**, which increases the frequency and intensity of **dry periods and Droughts**.
- Increase in **moisture and the drying up together change the rainfall** patterns in unpredictable ways.

◦ **Increased Snowfall in the Eurasian Region:**

- Increased snowfall in the Eurasian region also impacts monsoon rainfall in NE India as the excessive snowfall in **Eurasia** causes **cooling of the atmosphere of the region**, which triggers events eventually **leading to a weak summer monsoon season there**.

◦ **Change in Pacific Decadal Oscillation (PDO):**

- Sea surface temperatures over the subtropical **Pacific Ocean**, which vary in a cycle and each phase of which lasts a decade. The peak comes every 20 years and is known as the **Pacific Decadal Oscillation (PDO)**.
 - It may have an impact on the monsoon rainfall in NE.
- PDO is also being **influenced by global warming** as it decreases the difference of temperatures among the layers of the ocean.

◦ **Sunspot Epoch:**

- During the monsoon, rainfall patterns in **NE differed significantly from one Sunspot epoch to another**, suggesting differential intensification of the seasonal trough of low pressure over the country.
 - **Sunspot Epochs** are alternating periods of increased and decreased activity on the Sun's surface that influence the climate of Earth.

▪ **Impact:**

- The changing rainfall pattern, especially during the monsoon season, **affects the flow of rivers, extent of snow cover and health of mountain springs**, which in turn have an **impact on livelihoods, especially agriculture and fishing, forest flora growth, animal and bird habitat** (and behaviour) and other ecosystem aspects.
 - There is some evidence of rivers **such as Subansiri, Dibang (tributaries of Brahmaputra) and Brahmaputra** changing courses in unexpected ways.

- Extreme rainfall events being caused by global warming trigger **a cascade of events such as accelerated [Soil Erosion](#) along the hill slopes devoid of forest cover**. This increases surface run-off of rivers and changes their course.

[Source: DTE](#)

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