Eye on the monsoon

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"States must set up new recharging wells and improve existing ones on a war footing."

As India awaits the arrival of the annual summer monsoon, hopes are particularly high for normal rainfall that is so vital for agriculture, the health of forests, rivers and wetlands. The India Meteorological Department has forecast normal rainfall of 96% of the long period average of 89 cm rain, with an onset date in the first week of June in Kerala.

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It has also signalled a significant possibility of a deficit. The monsoon bounty is crucial for the 60% of gross cropped area in farming that is rain-fed, and represents, in the assessment of the National Commission on Farmers, 45% of agricultural output.

Given the erratic patterns of rainfall witnessed over the past few decades and their possible connection to atmospheric changes caused by a variety of pollutants, the distribution of monsoon 2019 will add to the insights.

The southwest monsoon is a determinant of India's overall prosperity, and sustained efforts to make the best use of rainfall are absolutely important for farms, cities and industry. Considering that there has been a 52% decline in groundwater levels based on tests conducted last year over the previous decadal average, State governments should have pursued the setting up of new recharging wells and made improvements to existing ones on a war footing.

They also have lagged in building structures to harvest surface water and helping farmers raise the efficiency of irrigation. The approach to the farming sector, however, has been influenced more by the imperatives of an election year, and the Centre's biggest intervention was to announce a cash handout to specified categories of small farmers.

A normal summer monsoon over the subcontinent brings widespread prosperity, but does not guarantee a uniform spread. This, as scientists point out, may be due to the effect of particulates released through various industrial and agricultural processes. Some of these aerosols suppress the rainfall and disperse it across the land, causing long breaks in precipitation, while others absorb heat and lead to a convection phenomenon that increases rainfall in some places.

Such evidence points to the need for India to clean up its act on rising industrial emissions, and burning of fossil fuels and biomass in order to improve the stability of the monsoon. An equally key area of concern is freshwater availability for households, which, NITI Aayog says, account for 4% of available supplies, besides 12% used by industry.

Urbanisation trends and the severe water stress that residents experience underscore the need for mandatory rainwater harvesting policies and augmented efforts by States to preserve surface water by building new reservoirs. Yet, governments are adopting a commodity approach to the vital resource, displaying deplorable indifference to the pollution and loss of rivers, wetlands and lakes that hold precious waters. This is no way to treat a life-giving resource.

Meaning of monsoon

- This is the word derived from the Arabic word 'mausim'. In summer, the wind flows in the opposite direction, which is called the monsoon of south-west or summer.
- In the winter the winds flow from north-east to south-west direction, which is called the winter monsoon.
- In the past, these winds helped traders navigate, so they are also called commercial winds or 'trade wind'.

How the of monsoon start?

- In the summer when the Sun in the Indian Ocean is just above the equator, then monsoon is formed.
- In this process, the surface of the ocean begins to get heated and its temperature reaches 30 degrees. During this time, the temperature of the earth reaches 45-46 degrees.
- In such a situation, monsoon winds are activated in the southern part of the Indian Ocean. These winds cross each other and cross the equator and move towards Asia. Meanwhile, the process of the formation of clouds over the sea begins.
- By crossing the equator, these winds and clouds rush to the Bay of Bengal and the Arabian Sea. During this time, the temperature of all the parts of the country is higher than the sea level.
- In such a situation, the winds begin to flow towards land from the ocean. These winds absorb the water vapor produced by the sea water and start rising upwards on the earth, and progresses ahead with raining.
- After reaching the Bay of Bengal and the Arabian Sea, these monsoon winds are divided into two branches.
- One branch goes forward along the Arabian Sea over of Mumbai, Gujarat and Rajasthan, while the second branch flowing from the Bay of Bengal to West Bengal, Bihar, Northeast, and collides with the Himalayas and turns towards the Gangetic regions and thus till the first week of July starts raining in the whole country.

Monsoon forecast?

- Monsoon is a tough puzzle that is very difficult to guess. The reason for this is that there are various types of climate zones and sub-zones in India. There are 127 agricultural climatic sub-divisions and 36 divisions in our country.
- The long-term forecast is issued by the Meteorological Department for monsoon in the middle of April. After this, the medium term and short-term forecasts are issued.
- However, for the past few years, the Meteorological Department has started predicting the weather for a few hours before now through 'Now Cast'.

Al Nino

- According to the scientists, if the surface of the ocean is suddenly warmed around the equatorial line, especially in the area of Peru near South America, in the Pacific Ocean, the situation of Al-Nino is formed.
- If this increase in temperature is between 0.5 degrees and 2.5 degrees, it can affect the monsoon. This reduces the pressure of air in the central and eastern Pacific oceans.
- The effect would be that the trade winds flowing around the equator line begin to weaken. These winds are monsoon winds that rains in India.

La-nina

- In the Pacific Ocean, sometimes the surface of the ocean begins to cool down. In such a situation, there is a direct opposite events of Al-Nino occurs , which is called La-Nina.
- La-Nina formation increases air pressure and the trade wind accelerates, which has a good effect on the Indian monsoon. For example, due to the effect of Al-Nino on monsoon in 2009, there was less rain, whereas in 2010 and 2011, good-rain was due to the effect of La-Nina.

Expected Questions (Prelims Exams)

1. Consider the following statements-

1. In winter, monsoon winds flow from south-west to north-west direction.
2. La-nino negatively affects Indian monsoon.

Which of the above statements is/are incorrect?

(a) Only 1
(b) Only 2
(c) Both 1 and 2
(d) Neither 1 nor 2

Expected Questions (Mains Exams)

Q. There is a close relation between South-West Monsoon and Indian Economy. Explain.
(250 Words)

Q. What do you mean by Aerosol? How aerosol negatively affects Indian Monsoon.
(250 Words)

Note: Answer of Prelims Expected Question given on 20 May. is 1 (c)