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General Studies-1

Monsoon Forecast

Sea surface temperature (SST) is routinely used for predicting whether the total amount of rainfall that India receives during the monsoon season will be less or more than the long-term mean of 887.5 mm.

Now, scientists from Pune's Indian Institute of Tropical Meteorology (IITM) find that ocean mean temperature (OMT) that has better ability to predict this than the sea surface temperature.

Benefits of New Forecast Method:

- Compared with SST which has 60% success rate of predicting the Indian summer monsoon, OMT has 80% success rate.
- The information on whether the amount of monsoon rainfall will be more or less than the long-term mean will be available by beginning of April, two months before the southwest monsoon can set in.
- This is because OMT is analysed by measuring the ocean thermal energy during the period from January to March. Southwest monsoon sets in around June 1 each year in Kerala .
- Similarly, OMT showed better success in predicting above or below-average rainfall years compared with SST. For instance, OMT was able to successfully predict 13 out of 16 below average rainfall years and seven out of nine above average rainfall years during the period 1993-2017.

Major Differences:

- Sea surface temperature gives information only about the thin upper layer of the ocean and does not reflect the thermal energy available in the upper ocean.
- The variations in the upper ocean thermal energy conditions are mainly responsible for summer monsoon activity.
- The heat content of the upper ocean creates more impact on monsoon than sea surface temperature, which is restricted to the skin of the ocean.

- The SST is restricted to a few millimetres of the top ocean layer and is largely influenced by strong winds, evaporation, or thick clouds.
- In contrast, OMT, which is measured up to a depth of 26 degree C isotherm, is more stable and consistent, and the spatial spread is also less.

Why it Works better?

- The reason why OMT performs better than SST is because OMT better represents the upper ocean thermal energy conditions.
- And the variations in the upper ocean thermal energy conditions are mainly responsible for the summer monsoon.
- The ocean mean temperature variations are more stable and consistent and have lower spatial and temporal spread. So OMT has better summer monsoon predictability than SST.

General Studies-2

BIMSTEC summit

Why in News?

Fourth BIMSTEC summit was recently held in Nepal. The member states have signed a Memorandum of Understanding (MoU) for the establishment of a Bimstec Gird Interconnection to enhance energy cooperation among the member states.

THEME OF BIMSTEC SUMMIT 2018: The theme of the fourth BIMSTEC summit is 'Towards a peaceful, prosperous and sustainable Bay of Bengal region'.

Kathmandu Declaration:

The Fourth BIMSTEC Summit concluded with an 18-point Kathmandu Declaration. The declaration is expected to enhance the effectiveness of BIMSTEC Secretariat by engaging it in various technical and economic activities in the region.

WHAT IS BIMSTEC SUMMIT?

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The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional organization comprising of seven member states in South Asia and Southeast Asia lying in littoral and adjacent areas of Bay of Bengal constituting a contiguous regional unity.

WHEN WAS BIMSTEC ESTABLISHED?

This sub-regional organisation came into being on June 6, 1997, through *the Bangkok Declaration*. It is headquartered in Dhaka, Bangladesh.

Composition:

It comprises of seven member countries: five deriving from South Asia — including Bangladesh, Bhutan, India, Nepal, Sri Lanka — and two from Southeast Asia, including Myanmar and Thailand.

Objectives of BIMSTEC:

- BIMSTEC is a sector-driven cooperative organization. Technological and economic cooperation among South Asian and Southeast Asian countries along the coast of the Bay of Bengal is its main objective.
- Starting with six sectors-including trade, technology, energy, transport, tourism and fisheries-for sectoral cooperation in late 1997, it expanded to embrace nine more sectors-including agriculture, public health, poverty alleviation, counter-terrorism, environment, culture, people to people contact and climate change-in 2008.

General Studies-3

MOVE Cyclathon

Hon'ble MoS Kiren Rijiju & Amitabh Kant, CEO NITI Aayog today flagged off MOVE Cyclathon, a cycle rally to promote cleaner, accessible modes of

transport. The cyclathon was held in the run up to the MOVE: Global Mobility Summit on September 7, 8 in New Delhi, and saw a participation of over 500 enthusiastic cyclists.

About 'Mobility Week'

- 'Mobility Week' will see 17 events in 7 days—from 31 August to 6 September 2018.
- These events will facilitate interactions with various stakeholders across the mobility domain.
- Participants include global and Indian leaders from across the mobility sector such as OEMs, battery manufacturers, charging infrastructure providers, technology solution providers, representatives from the Indian government as well as foreign governments, various inter-governmental organizations, academia, and policy think tanks.

About MOVE: Global Mobility Summit

- Steeply falling technology costs and business–model innovations are driving the world's transition to renewable energy and electric vehicles.
- Against this backdrop, NITI Aayog, in collaboration with various ministries and industry partners, is organizing 'MOVE: Global Mobility Summit' in New Delhi on 7th and 8th September, 2018.
- It will help drive the government's goals for vehicle electrification, renewable energy integration and job growth and also speed up India's transition to a clean energy economy.
- The Summit, which is the first of its kind, with over 1,200 participants expected from across the world including leaders from the government, industry, research organizations, academia, think tanks and civil society.

Soil Pollution: India

An extensive study of over 250 soil samples from three south Indian States — Kerala, Karnataka and Tamilnadu — has shown that most of the banana fields have amounts of copper, magnesium, chromium and cobalt higher than the threshold levels for normal soils.

Researchers from the Laboratory of Plant Science and Ecology at Mahatma Gandhi University, Kottayam, collected the different soil samples, categorised them according to soil taxonomy and used atomic absorption spectroscopy studies to analyse the level of different heavy metals.

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Details of Study:

- While the magnesium content of soil in South Indian soil is known to be between 30 and 220 mg/Kg, the average of the samples tested was above 900 mg/Kg.
- Calcium levels almost reaching the threshold were seen in many fields.
- Though the concentration of iron was high, the authors write it may be due to the laterite-based soil of the Deccan Plateau. Chromium, which rarely occurs naturally in soil, was detected in all the samples studied, and many samples were at levels near the threshold.

Reasons:

- This is a result of farmers using chemical fertilizers without proper soil testing and applying above the recommended level.
- As banana is highly prone to insect and nematode attack, they also more pesticides, which get accumulated in the soil
- Calcium is used to maintain the soil pH and over the years has accumulated in the soil.
- Another heavy metal recorded was manganese, which is a major component of pesticide used against fungal diseases like Fusarium wilt.

Way Forward

This is a preliminary report and the beginning of an investigation. More studies are needed to fully understand if the plant is also accumulating the heavy metals. There has been evidence from across the world that banana fruit accumulates heavy metals. More studies in the Indian context and the effect of consuming these fruits also need thorough examination.