

GEOGRAPHY**Arctic warming may lead to prolonged droughts: Study**

Arctic warming weakens the temperature difference between the tropics and the poles, resulting in less precipitation, weaker cyclones and mid-latitude westerly wind flow. This results in prolonged droughts, a study has found.

When those opposite temperatures are wider, the result is more precipitation, stronger cyclones and more robust wind flow. However, due to the Arctic ice melting and warming up the poles, those disparate temperatures are becoming closer.

What happens when Arctic is warmer?

- Analysis shows that, when the Arctic is warmer, the jet stream and other wind patterns tend to be weaker.
- The temperature difference in the Arctic and the tropics is less steep.
- The change brings less precipitation to the mid-latitudes.

What is happening right now?

- The northern high latitudes are warming at rates that are double the global average.
- This will decrease the equator-to-pole temperature gradient to values comparable with the early to middle Holocene Period that began 12,000 to 11,500 years ago.

Humans can detect the earth's magnetic fields

Now a team of researchers has shown that humans do indeed unconsciously respond to the changes in the earth's magnetic fields. Scientists have long known that turtles, birds, honeybees and even bacteria can sense the earth's magnetic field and use them for navigation.

Magneto-reception in Human Beings

- Magneto-reception has hardly been tested in humans and many studies have been inconclusive.
- The researchers wrapped with electrical coils, which helped simulate the earth's natural magnetic field.
- The participants were connected to an EEG set-up and their brain activity was monitored.
- In the one-hour session, for a few minutes, the magnetic field around the chamber was shifted. They noticed that during this period, the alpha power of the brain began to drop.
- When a human brain is unengaged, the alpha power is high.
- When something catches its attention, consciously or unconsciously, its alpha power drops.

INTERNATIONAL AFFAIRS- BILATERAL, GROUPINGS, ORGANISATIONS**African Union (AU)**

India and the African Union have signed a Memorandum of Understanding to establish an India-Africa health sciences collaborative platform.

Key facts:

- The ICMR had taken up the mandate to initiate and strengthen the cooperation in the health sector in a structured and organised manner by establishing an India-Africa Health Sciences Collaborative Platform.
- The agreement aims to formalise this partnership by establishing a framework. It will pave the way for cooperation in research and development, capacity building, health services, pharmaceutical trade and manufacturing capabilities for drugs and diagnostics.
- The programme would focus on training and strengthening capacity of health professionals, researchers, regulators and industry staff, support research collaborations for developing preventive tools and improved diagnostics for diseases which are regional priorities in India and Africa.

About AU:

- The African Union (AU) is a continental union consisting of 55 countries of the continent of Africa, with exception of various territories of European possessions located in Africa.
- The bloc was founded on 26 May 2001 in Addis Ababa, Ethiopia and launched on 9 July 2002 in South Africa.
- The intention of the AU is to replace the Organisation of African Unity (OAU), established on 25 May 1963 in Addis Ababa by 32 signatory governments.
- The most important decisions of the AU are made by the Assembly of the African Union, a semi-annual meeting of the heads of state and government of its member states.

- The AU's secretariat, the African Union Commission, is based in Addis Ababa.

Key objectives: To achieve greater unity and solidarity between the African countries and Africans. To defend the sovereignty, territorial integrity and independence of its Member States. To accelerate the political and social-economic integration of the continent.

INDIAN ECONOMY

Time to have institutional mechanism like Fiscal Council to enforce rules

Stressing on the need to have uniform rules for fiscal consolidation of States and Centre 15th Finance Commission's Chairman NK Singh called for institutional mechanism like a 'Fiscal Council' to enforce fiscal rules and keep a check on Centre's fiscal consolidation.

A check over borrowings

- For state government liabilities, Article 293 (3) provides a constitutional check over borrowings.
- But there is no such restriction on the Centre.
- It is time we have an alternative institutional mechanism like Fiscal Council to enforce fiscal rules and keep a check on Centre's fiscal consolidation.
- Singh had earlier proposed creation of an autonomous Fiscal Council with representatives from both states and Centre, but the recommendation was not implemented.

Why need Fiscal Council?

- Various cesses and surcharges are becoming disproportionate proportion of overall divisible revenue.
- There should be some mechanism to ensure that the basic spirit of the devolution process should not be undercut by clever financial engineering or taking recourse to traditions.
- There is a need for coordination between the finance commission as well as the GST Council, which he termed as the only federal institution in the country.
- There's need for coordination between Finance Commission and GST council.
- GST Council has no clue of what the Finance Commission is doing and Finance Commission has even lesser clue of what the GST Council is doing.

The municipal example

- It is very clear that successful economic growth, successful good quality employment depends on agglomerations that work.
- That in turn is going to depend on whether municipalities have enough revenue.
- What the municipalities get today in terms of revenue is one per cent of GDP whereas on comparative basis, looking at other emerging market countries, it really ought to be 5 per cent of GDP.

ENVIRONMENT- CONSERVATION, BIO-DIVERSITY AND ISSUES

Island protection zone (IPZ) 2019 for Andaman and Nicobar

The union environment ministry has notified island protection zone (IPZ) 2019 for Andaman and Nicobar.

The legal changes in the IPZ are aligned with the NitiAyog's proposal for holistic development in the Islands which is being taken forward under the guidance of the Island Development Agency.

Key highlights:

- It allows eco-tourism projects 20 metres from the high tide line (HTL) in smaller islands like Baratang, Havelock and Car Nicobar, and at 50 metres in larger ones.
- It allows for eco-tourism activities like mangrove walks, tree huts and nature trails in island coastal regulation zone IA (classified as the most eco-sensitive region of the islands which includes turtle nesting grounds, marshes, coral reefs etc).
- The notification also allows for construction of roads, roads on stilts by reclaiming land in exceptional cases for defence installations, public utilities or strategic purposes in eco-sensitive zones.
- It states that in case construction of such roads pass through mangroves, a minimum three times the mangrove area destroyed during the construction process shall be taken up for compensatory plantation of mangroves elsewhere.
- It also allows a number of new activities in the inter-tidal zone between low tide line and HTL. This includes land reclamation and bunding for foreshore facilities like ports, harbours,

jetties, wharves, quays, sea links etc, transfer of hazardous substances from ships to ports, manual mining of atomic minerals, and mining of sand for construction purposes with permission from local authorities in non-eco-sensitive sites.

SCIENCE AND TECHNOLOGY- EVERYDAY SCIENCE, SPACE, NUCLEAR, DEFENCE ETC

Block Chain Technology

- Coffee Board Activates Blockchain Based Marketplace in India.
- Blockchain based market place app for trading of Indian coffees is intended to bring in transparency in the trade of Indian coffee, maintain the traceability of Indian coffee from bean to cup so as the consumer tastes real Indian coffee and the grower is paid fairly for his coffee produced.

What are Blockchains?

- Blockchains are a new data structure that is secure, cryptography-based, and distributed across a network. The technology supports cryptocurrencies such as Bitcoin, and the transfer of any data or digital asset.
- Spearheaded by Bitcoin, blockchains achieve consensus among distributed nodes, allowing the transfer of digital goods without the need for centralized authorisation of transactions. The present blockchain ecosystem is like the early Internet, a permissionless innovation environment in which email, the World Wide Web, Napster, Skype, and Uber were built.

How it operates?

- The technology allows transactions to be simultaneously anonymous and secure, peer-to-peer, instant and frictionless. It does this by distributing trust from powerful intermediaries to a large global network, which through mass collaboration, clever code and cryptography, enables a tamper-proof public ledger of every transaction that's ever happened on the network.
- A block is the "current" part of a blockchain which records some or all of the recent transactions, and once completed, goes into the blockchain as permanent database. Each time a block gets completed, a new block is generated. Blocks are linked to each other (like a chain) in proper linear, chronological order with every block containing a hash of the previous block.

Benefits of blockchain technology:

- As a public ledger system, blockchain records and validate each and every transaction made, which makes it secure and reliable.
- All the transactions made are authorized by miners, which makes the transactions immutable and prevent it from the threat of hacking.
- Blockchain technology discards the need of any third-party or central authority for peer-to-peer transactions.

It allows decentralization of the technology.

DEFENCE

Dhanush Howitzers Inducted Into Indian Army:

Four indigenous Dhanush Howitzer guns were inducted to the Indian Army.

Key facts:

- Dhanush Long Range Artillery Guns are the first ever indigenous 155 mm x 45 calibre long-range artillery guns.
- They are equipped with inertial navigation-based sighting system, auto-laying facility, on-board ballistic computation and an advanced day and night direct firing system.
- They are improved version of Bofors guns acquired by India between 1987 and 1991.
- It has a new maximum effective range of 38 kilometers in salvo mode.

QUOTE OF THE DAY

"People often say that motivation doesn't last. Well, neither does bathing -- that's why we recommend it daily."

ZigZiglar