Prelim Bits 30-06-2023 | UPSC Daily Current Affairs

Groundwater Extraction & the Earth Axis

A recent study says that humans have used enough groundwater to shift Earth's tilt.

- **Earth's Axis and Poles -** The earth spins about its axis which passes through its centre, this movement is called rotation.
- The ends of the axis are the *North Pole* and *South Pole* respectively.
- This axis is inclined ***23.5 degrees*** away from the vertical, that is 66.5 degrees from the horizontal plane of its orbit.
- The earth rotates from west to east, and *once every 24 hours.*
- These are important fixed reference points we use in telling directions on the earth.

According to NASA, data from the 20th century shows that the spin axis drifted about 10 centimetres per year.

- **Polar Motion** - The phenomenon of shifting of poles and the axis naturally because of the mass distribution of planet changes, is known as polar motion.
- Reasons for polar motion **-** Ocean currents, hurricanes, climate-driven changes in water mass distribution, climate change, etc.
- **Recent Findings** – Between 1993 - 2010, a total of 2,150 gigatons of groundwater has been removed from earth.
- This has shifted Earth's tilt *31.5 inches eastward.*
- The calculations matched with previous research, which estimated that groundwater extraction *raised global sea levels by 6.24mm* between 1993 and 2010.
- Groundwater extraction from North America and northwestern India (located at the Earth's mid-latitudes), had an enormous impact on the polar motion compared to the extraction in poles or equators.

Reference

The Indian Express | Groundwater extraction shifted earths axis

Divya Kala Mela 2023

'DIVYA KALA MELA', 2023 the 10 days event show casing the products and craftsmanship of Divyang entrepreneurs/artisans has been inaugurated in Bhopal, Madhya Pradesh recently.

- It is a unique event showcasing the products and craftsmanship of Divyang entrepreneurs/artisans from across the country.
- The term Divyang is used to describe *people with disabilities in official and legal discourse.*
- **Held on** – 29 June, 2023 to 5 July, 2023 at Jaipur, Rajasthan.

- **Ministry** - Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice & Empowerment.
- The event will feature a wide range of products, including handicrafts, handlooms, embroidery works, packaged food, and more.
- The products will be from various parts of the country, including *Jammu and Kashmir*, the North Eastern states, and other regions.
- It is a powerful medium to take the concept of *vocal for local* to the masses.

As per Census, 2011, disabled population in India accounts for 2.21% of the total population.

Reference

PIB | DIVYA KALA MELA

Aspartame

The International Agency for Research on Cancer (IARC) of the World Health Organisation (WHO) will list aspartame as "possibly carcinogenic" to humans, the third category among the four levels of carcinogens.

- Aspartame is an odorless powder that is white and one of the world's most common ***artificial sweeteners*.**
- Chemically, aspartame has 2 amino acids *- L-aspartic acid* and *L-phenylalanine*.
- Aspartic acid is produced naturally by your body, and phenylalanine is an essential amino acid that is intaken from food.
- It was discovered by *James M Schlatter in 1965*.
- It is used as a sugar alternative as it has zero calories (diet soft drinks) and no bitter aftertaste (sugar-free products).
- Aspartame is less sweet than other artificial sweeteners like advantame and neotame, but it is about *200 times sweeter than table sugar.*
- 8 g of sugar provides about 32 kcals of energy and 1 g of aspartame is only ***4 kcals.***
- As per US Food and Drug Administration (FDA), the acceptable daily intake (ADI) for aspartame is at *50 milligrams per kilogram of body weight per day.*

- Foods containing aspartame carry the warning "Not for phenylketonurics".

Phenylketonuria (PKU) is a rare inherited disorder in which the patient does not have the enzyme needed to break down phenylalaninee.

- Around 100 countries around the world, including *India*, permit the use of aspartame.
- In India, *FSSAI* recommends the maximum permitted levels of aspartame.
- **Other products under WHO's cancer-causing categories** - Prior to this, working overnight, consuming red meat, and using mobile phones were put under cancer-causing categories.

Reference

The Indian Express | Aspartame Sugar Additive who health impact sugar

Ocean's cooling of Planet

A recent study says that oceans cool the planet by releasing short-lived halogens that contribute 8-10% of cooling.

Halogens

- A halogen is a chemical element that forms a salt when it reacts with metal.
- Halogens are all *nonmetallic* substances and create brittle solids and have poor heat and electrical conductivity.
- The halogen elements are the six elements in Group 17 of the periodic table.
- **Short-lived Halogens -** Short-lived halogens are ***chlorine, bromine and iodine*** compounds with a lifetime of ***less than 6 months*** in the atmosphere and are naturally produced by the oceans.

Findings

- **Increase in warming** - The short-lived halogens
  - Increases the global *methane* burden by 14 % and 9 % for pre-industrial and present-day conditions
  - Increases the levels of *water vapour,* a greenhouse gas
  - Reduces the formation of cooling *aerosols*, minute particles suspended in the atmosphere that reflect sunlight
- Though these halogens drive an increase in warming by influencing methane, water vapour and aerosols, they compensate this by destroying ozone, which exerts a cooling effect.
- **Cooling the planet** - Halogens cause a depletion of ozone (a greenhouse gas that traps outgoing radiation) leading to warming in the troposphere.
- Short-lived halogens from oceans reduces warming by depleting ozone contributing to its cooling effect.
- Currently, these halogens contribute 8-10% of cooling.
- Overall, the net cooling effect was found to be -0.13 ± 0.03 W m-2.

Reference

Down to Earth | Oceans cool the planet by releasing short-lived halogens

Children and Armed Conflict Report, 2023

The United Nations (UN) has removed India from its annual list of countries where children are impacted by armed conflict.

- The report includes trends regarding the impact of armed conflict on children and information on violations committed every year.
- **Released by** - United Nations General Assembly and Security Council.
- **Objective** - To strengthen the protection of children affected by armed conflict, raised awareness and foster international cooperation to improve their protection.
- **Findings** - The highest number of violations were committed in the Democratic Republic of the Congo, Israel, Palestine, Somalia, Syria, Ukraine, Afghanistan, and Yemen.
- The monitoring and verification of grave violations remained extremely challenging owing to access constraints leading to the underreporting and increase in the violations verified in 2022.
- The countries where “the worst deterioration” occurred were Myanmar, South Sudan, and Burkina

Faso.
- There were 1,163 attacks on schools recorded, and 647 attacks on hospitals a 112% increase in 2022.

International Convention on the Rights of the Child

- It is an international treaty that recognizes the human rights of children, defined as *persons up to the age of 18 years*.
- The Convention establishes in international law that States Parties must ensure that all children without discrimination in any form benefit from special protection measures and assistance.
- ***196 countries*** have become State Parties to the Convention as of 2015.
- The *United States and Somalia*, have not ratified the Convention.
- ***India ratified*** the CRC in 1992.

Reference

Down to Earth | UN removed india from children impacted by armed conflict report

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