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Large Hadron Collider

- Physicists at the Large Hadron Collider (LHC) in Switzerland might have discovered a brand new force of nature.
- LHC is the world's largest and most powerful particle accelerator. It is present in the European Council for Nuclear Research's (CERN's) accelerator complex and was first started up on 10 September 2008.
- It has a 27-kilometre ring of superconducting magnets with a number of accelerating structures to boost the energy of the particles along the way.
- It is designed to produce proton-proton collision, to be followed by collisions between lead nuclei.
- Inside the accelerator, two high-energy particle beams travel at close to the speed of light before they are made to collide. The beams travel in opposite directions in two separate beam pipes kept at ultrahigh vacuum.
- They are guided around the accelerator ring by a strong magnetic field maintained by superconducting electromagnets.
- Much of the accelerator is connected to a distribution system of **liquid helium**, which cools the magnets, as well as to other supply services.

Biodiversity Heritage Site

- Maharashtra government declared an area at Amboli in Western ghats in Sindhudurg district as a Biodiversity Heritage Site (BHS).
- BHS are areas that are unique, ecologically fragile ecosystems - terrestrial, coastal, and inland and marine waters - having rich biodiversity.
- The biodiversity comprises of any one or more of the components like,
    1. Species richness - Wild and domesticated species or intra-specific categories,
    2. High endemism,
    3. Presence of rare, endemic and threatened species, keystone species, species of evolutionary significance,
    4. Presence of wild ancestors of domestic/cultivated species or land races or their varieties,
    5. Past pre-eminence of biological components represented by fossil beds and having cultural or aesthetic values.
    6. Area with significant cultural, ethical or aesthetic values; important for

the maintenance of cultural diversity

- As per the Section 37 of the Biological Diversity Act, 2002,
    1. State Governments can notify in the official gazette, in consultation with 'local bodies', areas of biodiversity importance as BHS.
    2. State Government in consultation with the Central Government may frame rules for the management and conservation of BHS.
    3. State Governments can frame schemes for compensating or rehabilitating anyone economically affected by such notification.
- State Biodiversity Boards (SBB) may invite suggestions for declaration of BHSs, through the Biodiversity Management Committees (BMCs) and other relevant community institutions.

Schistura Hiranyakeshi

- It is a new small freshwater fish species discovered near Amboli in Sawantwadi tehsil of Sindhudurg district.
- It is a rare sub-species of Schistura, a freshwater loach.
- Named after the Hiranyakeshi River near Amboli village, this fish is a colourful fish that lives in water and streams in an abundance of oxygen.
- It was important to conserve this species as it might face extinction due to fishing activities.

Jammu and Kashmir Lakes

- Srinagar's Dal Lake along with five other ones in Jammu and Kashmir are to be declared protected wetlands.
- Other lakes - Wular Lake, Nigeen Lake in the Kashmir region; Sanasar Lake, Manasbal Lake and Purmandal lake or Chotta Kashi (in Samba district) in the Jammu region.
- The decision was taken in the meeting of the Jammu and Kashmir Wetland Authority, chaired by Chief Secretary.
- Chief Secretary asked the Forest Department to profile various wetlands of Jammu and Kashmir and recommend their notification under,
    1. Environment Protection Act, 1986 and
    2. Wetland (Conversation & Management) rules.
- [Forest Department is the nodal department for the preparation of digital inventory, documentation and development of a geo-spatial database on wetlands.]

Apophis Asteroid

- First detected in 2004, Apophis is now officially off National Aeronautics and Space Administration's (NASA's) asteroid "risk list".

- This has ruled out any chance of Apophis smacking Earth in 2068, and don't show any impact risk for at least the next 100 years.
- **Asteroids** or planetoids or minor planets are made up of metals and rocks. They revolve around the sun and are too small to be called planets.
- Asteroid belt is located roughly between the orbits of the planets Jupiter and Mars. The mass of all the asteroids is less than that of Earth's moon.

Sentry

- It is NASA's highly automated collision monitoring system that continually scans the most current asteroid catalog for possibilities of future impact with Earth over the next 100 years.
- Whenever a potential impact is detected, it will be analyzed and the results will be immediately published in the 'asteroid risk list', except in unusual cases where independent confirmation is sought.

Asteroid Impact and Deflection Assessment (AIDA)

- It is the first international space mission to demonstrate asteroid impact hazard mitigation ny using a kinetic impactor to deflect an asteroid and measure the deflection.
- This mission that targets a double asteroid called Didymos is cooperation between NASA's Double Asteroid Redirection Test (DART) mission and European Space Agency's (ESA's) Hera.
    1. DART (to be launched in 2021) would slam into the smaller asteroids of the Didymos system in 2022.
    2. Hera (to be launched in 2024) would measure the impact crater produced by DART collision and study the change in the asteroid's orbital trajectory. It will arrive at the Didymos system in 2027.
- AIDA will help in studying asteroid strength, surface physical properties and internal structure.

Comprehensive Environmental Pollution Index

- Comprehensive Environmental Pollution Index (CEPI) is a rational number to characterise the quality of the environment at a given location following the algorithm of source, pathway and receptor.
- An increase in CEPI score denotes adverse effects on the receiving environment.

- A Delhi-based think-tank Centre for Science and Environment (CSE) did an assessment of Tamil Nadu's CEPI scores.
- Groundwater is becoming more polluted in Tamil Nadu's industrial areas and Vellore is the state's most polluted district in terms of river pollution.

- According to the CEPI water score 2018, five industrial clusters in Tamil Nadu were found to have a water score of more than 50. Of these,
    1. Vellore-North Arcot, Manali and Tiruppur were 'critically polluted areas' - CEPI individual score of 60 and above.
    2. Cuddalore and Coimbatore were 'severely polluted areas' - CEPI individual score between 50 and 60.
- Most serious pollution threat to groundwater was from calcium, chloride and iron that are associated with sewage and pollution from tanneries.

Dindori Project

- International Fund for Agricultural Development (IFAD) has supported an initiative to revive kodo millet and kutki (little millet) cultivation in Dindori district of Madhya Pradesh.
- The IFAD project was started in 2013-14, with women-farmers from 40 villages - mostly from the Gonda and Baiga tribes - growing these two minor millets.
- The identified farmers were supplied good-quality seeds and trained by Jawaharlal Nehru Agricultural University in Jabalpur and the local Krishi Vigyan Kendra.
- They were trained on field preparation, line-sowing and application of compost, zinc, bavastin fungicide and other specific plant protection chemicals.
- Further, a federation of the farmers' self-help groups undertook procurement of the produce and also its mechanical de-hulling.
- [Mechanical de-hulling is the traditional time-consuming manual pounding process to remove husk from the grain.]
- The IFAD project has helped in meeting nutritional goals and reviving millet cultivation.

Millets

- Millets score over rice and wheat, whether in terms of vitamins, minerals and crude fibre content or amino acid profile. They are gluten-free.
- In 2018, the Union Agriculture Ministry declared millets as "Nutri-Cereals", considering their "high nutritive value" and also "anti-diabetic properties". 2018 was observed as 'National Year of Millets".
- The UN General Assembly too adopted an India-sponsored resolution to mark 2023 as the "International Year of Millets".
- Yet, these high-nutrient cereals (fine grains) aren't the first choice of either consumers or farmers.

Source: PIB, The Hindu, The Indian Express, Down To Earth

