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C-C nozzle

The Indian Space Research Organisation (ISRO) recently said that it has successfully developed a lightweight Carbon-Carbon (C-C) nozzle for rocket engines.

- It is a lightweight Carbon-Carbon (C-C) nozzle to enhance the vital parameters of rocket engines.
- **Developed by -** Indian Space Research Organisation (ISRO).
- The key feature of the nozzle is its ***anti-oxidation coating of Silicon Carbide***, which extends its operational limits in oxidizing environments.
- This coating reduces thermally induced stresses and enhances corrosion resistance, allowing for extended operational temperature limits in hostile environments.
- Polar Satellite Launch Vehicle (PSLV)-4 currently employs twin engines with nozzles made from ***Columbium alloy.***
- By replacing the engines with C-C nozzle , a mass reduction of approximately 67% can be achieved.
- This substitution is projected to increase the payload capability of the ***PSLV by 15 kg.***
- **Features**
  - Low density
  - High specific strength
  - Excellent stiffness
  - Capable of retaining mechanical properties even at high temperatures.

References

1. Times of India | Carbon-Carbon Rocket Engine Nozzle
2. ISRO | Carbon-Carbon Nozzle for Rocket Engines
3. India Today | Carbon-Carbon (C-C) nozzle

Global Forest Watch Monitoring Project

The recent report of Global Forest Watch monitoring project says that India has lost 2.33 million hectares (6%) of tree cover since 2000.

Findings

- **Loss of Primary forests –** India lost **4.1%** of humid primary forest from 2002 to 2023, making up 18% of its total tree cover loss in the same period.
- **Absorption of Co2 –** Between 2001 and 2022
  - India emitted 51 million tons of carbon dioxide equivalent a year
  - Removed 141 million tons of carbon dioxide equivalent a year,
  - Represents a net carbon sink of 89.9 million tons of carbon dioxide equivalent a year.
- **Loss of Natural forests -** The data showed that 95% of the tree cover loss in India from 2013 to 2023 occurred within natural forests.
- The country lost 175,000 hectares of tree cover in 2016 and 144,000 hectares in 2023, the highest in the last 6 years.
- The maximum tree cover loss occurred in **2017.**
- **Highest tree cover lost states -** The GFW data showed that 5 states accounted for 60% of all tree cover loss between 2001 and 2023.
- **5 States –** Assam, Mizoram, Arunachal Pradesh, Nagaland and Manipur.

According to the Food and Agriculture Organisation, the rate of deforestation in India was 668,000 hectares per year between 2015 and 2020, the 2nd highest worldwide

- **Loss due to fires -** The data showed India lost 35,900 hectares of tree cover due to fires from 2002 to 2022, with its maximum in 2008.
- **Highest tree cover losing states due to fires (2001 to 2022)** – Odisha, Arunachal Pradesh, Nagaland, Assam, and Meghalaya.

Global Forest Watch (GFW)

- It is an online platform that provides data and tools for monitoring forests.
- It is established by ***World Resources Institute (WRI***), launched in **1997**.
- GFW uses cutting-edge technology that allows anyone to access near real-time information about where and how forests are changing around the world.

References

1. The Indian Express | Global Forest Watch Report
2. Global Forest Watch | About

Bhandasar Jain Temple

- The Bhandasar Jain Temple is a ***temple made of ghee,*** situated in ***Bikaner, Rajasthan.***
- It was constructed by the wealthy Jain merchant ***Bhandasa Oswal.***
- This temple is dedicated to the ***5th Tirthankara, Sumatinatha.***
- It is protected by the ***Archaeological Survey of India.***
- It is said that during a period of severe drought, when water was scarce, Bhandasa Oswal decided to use ghee (40,000 kilogram), as a substitute for water in the temple's mortar.
- **Architecture-** The temple itself is a 3-storied marvel, constructed using ***red sandstone*** with intricate ***yellow-stone carvings*** adorning its walls, pillars, and mandapa.
- The sanctum, or garbhagriha, is a ***pancharatha,*** covered by a shikhara with karna-amalakas and amalakas at the top.
- The temple's walls are embellished with leaf paintings, frescoes, and ornamented mirror work, which depict the lives of the ***24 Tirthankaras.***

References

Times of India | Bhandasar Jain Temple

Thiruvalluvar

- Thiruvalluvar, a revered ancient saint, poet, and philosopher with no caste or religion, has been regarded as a Tamil cultural and moral icon.
- **Historicity -** His family history, religion, or location of birth are all unknown certainties.
- The period during which he lived is debated.
- Some accounts place him in the 3rd or 4th century CE; others date him in the 8th or 9th century.
- He has been identified as both a Hindu and a Jain sage, while Dravidian groups consider him as a saint with no religious identifiers except his Dravidian roots.
- **Thirukkural -** The 'Thirukkural' or 'Sacred Couplets', a collection of moral aphorisms in verse that is attributed to Thiruvalluvar, does not

name him as its author.
- He is named first in a later collection of verses known as 'Thiruvalluva Malai'.
- In 1935, the Tamil Nadu government officially recognized ***31 BCE as the year of Valluvar.***

Tirukkural

- The Tirukkuṟaḷ, or the Kural, is a classic Tamil language text consisting of 1,330 short couplets, or kurals, of 7 words each.
- Its 133 sections of 10 couplets each are divided into 3 books - aram (virtue), porul (government and society), and kamam (love).
- It is widely acknowledged for its universality and secular nature.
- It is one of the ***Patiren-kirkkanakku ("Eighteen Ethical Works") in Tamil literature.***

References

1. The Indian Express | Thiruvalluvar
2. Britannica | Thiruvalluvar

Men5CV Vaccine

Nigeria has become the 1st country in the world to roll out a new vaccine (called Men5CV) against meningitis.

- It protects people against 5 strains (A, C, W, Y and X) of the ***meningococcus bacteria.***
- It was recommended by the ***World Health Organization (WHO).***
- The vaccine and emergency vaccination activities are funded by Gavi, the Vaccine Alliance.

Nigeria is one of the 26 meningitis hyper-endemic countries of Africa, situated in the area known as the African Meningitis Belt.

Meningitis

- Meningitis is a serious infection that leads to the inflammation of the membranes (meninges) that surround and protect the brain and spinal cord.
- There are multiple causes of meningitis, including viral, bacterial, fungal and parasitic pathogens.

- Bacterial meningitis is the most serious, can also result in septicaemia (blood poisoning), and can seriously disable or kill within 24 hours those that contract it.
- **Symptoms -** Headache, fever and stiff neck.
- **Road map to meningitis -** In 2019, WHO and partners launched the global roadmap to defeating meningitis by 2030.
- The roadmap sets a comprehensive vision towards a world free of meningitis, and has 3 goals:
    - Elimination of bacterial meningitis epidemics;
    - Reduction of cases of vaccine-preventable bacterial meningitis by 50% and deaths by 70%; and
    - reduction of disability and improvement of quality of life after meningitis due to any cause.

Reference

WHO | Nigeria introduces new 5-in-1 vaccine

