Prelim Bits 21-04-2022 | UPSC Daily Current Affairs

Space Bricks

Researchers from the Indian Space Research Organisation (ISRO) and the Indian Institute of Science (IISc) have developed a way *to make 'space bricks'.*

- The team has demonstrated that the **slurry-casting method** is used to make 'space bricks' from Martian soil with the help of bacteria and urea.
- **Microbial Induced Calcite Precipitation** (MICP) technique, where certain bacteria can precipitate calcium carbonate using soil under right conditions, was used to create 'space bricks'.
- These 'space bricks' can be used to construct building-like structures on Mars that could facilitate human settlement on the red planet.
- **Slurry-casting Method** - First, a slurry was made by mixing Martian soil with guar gum, *Sporosarcina pasteurii* bacteria, urea and nickel chloride (NiCl2).
- This slurry can be poured into moulds of any desired shape, and over a few days the bacteria - using bio-mineralisation - can convert the urea into crystals of calcium carbonate.

  Bio-mineralisation is a process by which living organisms produce minerals to harden or stiffen existing tissues.

- These calcium carbonate crystals, along with biopolymers secreted by the microbes, act as cement holding the soil particles together.
- As the Martian soil has a lot of iron that causes toxicity to organisms, adding NiCl2 will make the soil hospitable to the bacteria.
- To recreate conditions on Mars while creating the brick, researchers have constructed a device - MARS (Martian AtmospheRe Simulator).
- **Benefits** - The slurry-casting method ensures that the bricks are less porous, which was a problem with other methods used to make Martian bricks.
- The bacteria seep deep into the pore spaces, using their own proteins to bind the particles together, decreasing porosity and leading to stronger bricks
- **Difference** - In the past, the team had made bricks out of lunar soil using a similar method.
- However, the previous method could only produce cylindrical bricks, while the current slurry-casting method can also produce bricks of complex shapes.

Reference

1. https://www.thehindu.com/todays-paper/tp-national/tp-andhrapradesh/buildings-can-be-constructed-on-mars-with-space-bricks/article6534010ece
2. https://timesofindia.indiatimes.com/home/science/iisc-isro-experts-develop-space-bricks-for-mars/articleshow/90946328.cms
3. https://www.republicworld.com/science/space/isro-iisc-develop-space-bricks-for-habitat-construction-on-moon-and-mars-articleshow.html

Sarmat Intercontinental Ballistic Missile

Russia has successfully test-fired the Sarmat intercontinental ballistic missile.

- The Sarmat is a Russian liquid-fueled intercontinental ballistic missile capable of nuclear charges.
- This multiple independently targetable reentry vehicle (MIRV)-equipped weapon can be deployed with 10 or more warheads on each missile.
- It is claimed that it has the longest range of destruction of targets in the world.
- Dubbed **Satan-2** by Western analysts, Sarmat is designed to elude anti-missile defence systems with a short initial boost phase, giving enemy surveillance systems a tiny window to track.
- The name Sarmat is based upon the **nomadic Sarmatian tribes** which used to live between 6th and 4th century BC in current territories of Russia, Ukraine and Kazakhstan.

Reference

1. https://www.ndtv.com/world-news/russias-tests-new-sarmat-missile-amid-ukraine-war-10-things-about-the-nuclear-capable-weapon-that-can-elude-anti-defence-system-2905171
2. https://www.republicworld.com/world-news/russia-ukraine-crisis/dubbed-as-satan-2-russia-test-fires-intercontinental-ballistic-missile-sarmat-articleshow.html
3. https://www.foxnews.com/world/russia-tests-sarmat-intercontinental-ballistic-missile

Chennakeshava Temple

The recital of the Quran marks the beginning of the rathotsava (chariot festival) at the historic Chennakeshava temple in Belur, Karnataka.

- The 900-year-old Chennakeshava temple was consecrated by Hoysala **King Vishnuvardhana** in the **Vijayanagar style**.
- He built the temple to mark his victories in **1116 AD** against the Cholas in the Battle of Talakkad and called it the **Vijaya Narayana Temple**.
- This 12th-century temple was built using **soft soapstone** as they were found suitable for intricate carvings.
- The temple was built by master craftsmen - Dasoja and Chavana, a father and son duo, hailing from Balliganve, a centre of Kalyana Chalukya art.
- Shantaladevi, the queen of King Vishnuvardhana is the model for a sculpture in the Vavaranga - **Darpana Sundari** (lady with the mirror).
- The temples of Kappe Chennigaraya, Soumyanayaki, Andal and other Vaishnava manifestations surround this main temple.

Belur

- Beluru (also known as Velapuri, Velur and Belapur in olden times) is situated on the banks of Yagachi River.
- Belur was the first capital city of the Hoysalas.
- The city was so revered by the Hoysalas that it is referred to as “earthly *Vaikuntha*” (Vishnu’s abode) and “*Dakshina* Varanasi” (southern holy city) in later inscriptions.

Reference

1. https://www.thehindu.com/news/national/karnataka/amidst-communal-strife-in-karnataka-belur

s-historic-chennakeshava-temple-strikes-a-note-of-harmony/article65320677.ece
2. https://hassan.nic.in/en/tourist-place/chennakeshava-temple-belur/
3. https://www.karnatakatourism.org/tour-item/beluru/
4. https://cisindus.org/2021/06/05/the-chennakeshava-temple-the-marvel-of-belur/

Seaweed

A Union Minister has said that the work on the seaweed park proposed in Tamil Nadu will commence as soon as the State government allots the land for a special economic zone for seaweed farming.

- "Seaweed" is the common name for **countless species of marine plants and algae** that grow in the ocean as well as in rivers, lakes, and other water bodies.
- Seaweeds are generally anchored to the sea bottom or other solid structures by rootlike "holdfasts".
- The holdfasts perform the sole function of attachment and **do not extract nutrients** as do the roots of higher plants.
- **Size** - Some seaweeds are microscopic, such as the phytoplankton that live suspended in the water column and provide the base for most marine food chains.
- Some are enormous, like the giant kelp that grow in abundant "forests" and tower like underwater redwoods from their roots at the bottom of the sea.
- Most are medium-sized, come in colors of red, green, brown, and black, and randomly wash up on beaches and shorelines just about everywhere.
- **Benefits** - These fixed and free-floating "weeds" of the sea utterly essential to innumerable marine creatures, both as food and as habitat.
- A number of seaweed species are edible, and many are also of commercial importance to humans.
- Some are used as fertilizers or as sources of polysaccharides.
- Seaweed is chock-full of vitamins, minerals, and fiber, and can be tasty.
- Many types of seaweed contain anti-inflammatory and anti-microbial agents.
- The ancient Romans used them to treat wounds, burns, and rashes.
- Certain seaweeds do possess powerful cancer-fighting agents that will eventually prove effective in the treatment of malignant tumors and leukemia in people.
- The ancient Egyptians may have used them to treat breast cancer.
- Among their many uses in manufacturing, they are
    1. Effective binding agents (**emulsifiers**) in such commercial goods as toothpaste and fruit jelly, and
    2. Popular softeners (**emollients**) in organic cosmetics and skin-care products.
- **Related Links -** Seaweed Mission, Pradhan Mantri Matsya Sampada Yojana**,** New Red Algae Species
- **Similar Links -** Seagrasses, Dugong or Sea Cow, Coral Reefs & Coral Bleaching

Reference

1. https://www.thehindu.com/news/cities/chennai/work-on-seaweed-park-after-state-government-allots-land-l-murugan/article65326453.ece
2. https://oceanservice.noaa.gov/facts/seaweed.html#:~:text=%22Seaweed%22%20is%20the%20common%20name,Marine%20Sanctuary%20and%20National%20Park.
3. https://www.britannica.com/science/seaweed

India Elected to Four UN ECOSOC Bodies

India got elected to four key United Nations Economic and Social Council (UN ECOSOC) Bodies.

- The four UN ECOSOC bodies include
    1. Commission for Social Development,
    2. Committee on NGOs,
    3. Commission on Science & Technology for Development and
    4. Ambassador Preeti Saran gets re-elected to Committee for Economic, Social and Cultural Rights.
- Earlier in 2021, India got elected to three UN ECOSOC bodies which include,
    1. Commission on Crime Prevention and Criminal Justice,
    2. Executive Board of UN Women, and
    3. Executive Board of the World Food Programme.
- Also, India handed over contribution of US$ 200,000 to support critical areas of investigations of the UN Investigative Team to Promote Accountability for Crimes by Da'esh/ ISIL (UNITAD) i.e.,
    1. Development and use of chemical and biological weapons by Islamic State of Iraq and the Levant (ISIL) and
    2. ISIL crimes against cultural heritage in Iraq.

United Nations Economic and Social Council

- The UN Economic and Social Council (ECOSOC) is one of the six principal organs of the UN System.
- It was established by the UN Charter in 1945.
- It consists of 54 members of the UN elected by the General Assembly.
- It serves as the central platform for fostering debate and creative thinking, forging consensus on ways forward, and coordinating efforts to achieve internationally agreed goals.
- It is also responsible for the follow-up to major UN conferences and summits.
- **Related Links -** United Nations Statistical Commission

Commission of Social Development

- It is the key body of the UN which is in charge of the follow-up and the implementation of the Copenhagen Declaration & Programme for Action.
- It advises the ECOSOC on social policies of a general character, and in particular on all the matters in the social field that are not covered by specialized inter governmental agencies.

Committee on Non-Governmental Organisations

- It is a standing Committee of the Economic and Social Council which was established in 1946.
- Its main tasks are the consideration of applications for consultative status and requests for reclassification submitted by the NGOs.

UN Commission on Science and Technology for Development

- It is a subsidiary body of the Economic and Social Council which holds an annual intergovernmental forum for the discussion on timely and pertinent issues affecting technology, science, and development.
- Outcomes of this Commission include providing the UNGA and ECOSOC with high-level advice on the relevant science and technology issues

Committee on Economic, Social and Cultural Rights

- The Committee on Economic, Social and Cultural Rights (CESCR) is a body of 18 independent experts.
- It monitors the implementation of the International Covenant on Economic, Social, and Cultural Rights by its State Parties.
- CESCR enshrines the rights to adequate food, adequate education, health, housing, water and sanitation, and work.

Reference

1. https://newsonair.com/2022/04/14/india-gets-elected-to-four-united-nations-ecosoc-bodies/
2. https://www.un.org/ecosoc/en/content/about-us

