Prelim Bits 05-08-2022 | UPSC Daily Current Affairs

Khayyam Satellite

Russia will launch an Iranian remote sensing satellite 'Khayyam' into orbit by using its Soyuz 2.1B satellite carrier.

- The satellite is named after 11th-12th century Persian polymath Omar Khayyam.
- This satellite is a remote sensing satellite designed and manufactured at enterprises that are part of the Russian Space Corporation Roscosmos.
- The satellite has high imaging accuracy and is capable of filming the earth's surface in different image spectra. It aims to
    1. Monitor the country's borders,
    2. Enhance agricultural productivity and
    3. Monitor water resources and natural disasters.
- Russia is putting the satellite into space but it will be guided and controlled from ground stations in Iran.

Iran insists its space programme is for civilian and defence purposes only and does not breach the 2015 nuclear deal between Iran and world powers, or any other international agreement.

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Minerals Security Partnership

Minerals Security Partnership (MSP) is a new US-led partnership initiative of 11 nations that aims to bolster critical mineral supply chains.

- Minerals Security Partnership (MSP) is an ambitious new alliance formed by the US to secure supply chains of **critical minerals**.
- The US and 10 partners - Australia, Canada, Finland, France, Germany, Japan, South Korea, Sweden, the United Kingdom, and the European Commission - have come together to form the MSP.
- This partnership was formed due to the massive supply-chain disruptions caused by the global 'China-plus-one' strategy adopted post the Covid-19 pandemic.

- MSP was formed in order to break the dominance and reduce dependence on China in mining and processing rare earth minerals.
- The goal of the alliance is to ensure that critical minerals are produced, processed, and recycled in a manner that supports the ability of countries to realise the full economic development benefit of their geological endowments.
- The focus would be on the supply chains of minerals such as **Cobalt, Nickel, Lithium** and also the **17 rare earth minerals**.
- MSP is aimed at **catalysing investment** from governments and the private sector to develop strategic opportunities that adhere to the highest environmental, social, and governance standards.

India is not part of the MSP, but New Delhi is working through diplomatic channels to fetch an entry.

- **Importance of the minerals** - Minerals like Cobalt, Nickel, and Lithium are required for batteries used in electric vehicles.
- REEs are an essential - although often tiny - component of more than 200 consumer products, including mobile phones, hard drives, electric and hybrid vehicles, flatscreen monitors, high-end electronics, etc.

According to a report released by the International Energy Agency in 2021 and subsequently updated in March 2022, the major producers of critical minerals globally are Chile, Indonesia, Congo, China, Australia and South Africa.

Rare Earth Elements

- The Rare earth elements (REE) include 17 elements. They are,
    1. The 15 Lanthanides (atomic numbers 57 - which is Lanthanum - to 71 in the periodic table)
    2. Scandium (atomic number 21) and
    3. Yttrium (atomic number 39).
- REEs are classified as
    1. Light RE elements (LREE) and
    2. Heavy RE elements (HREE).
- Some REEs are available in India — such as Lanthanum, Cerium, Neodymium, Praseodymium and Samarium, etc.
- Others such as Dysprosium, Terbium, and Europium, which are classified as HREEs, are not available in Indian deposits in extractable quantities.
- Hence, there is a dependence on countries such as China for HREEs, which is one of the leading producers of REEs, with an estimated 70% share of the global production.
- **Related Links -** Critical Minerals

India’s Major Concern

- India is seen as a late mover in attempts to enter the lithium value chain.

- India has an ambitious plan to convert a large percentage of its transport to electric, and would require these minerals.
- According to the plan, 80% of the country's two- and three-wheeler fleet, 40% of buses, and 30 to 70% of cars will be EVs by 2030.
- If India is not able to explore and produce these minerals, it will have to depend on a handful of countries, including China, to power its energy transition plans to electric vehicles.
- That will be similar to our dependence on a few countries for oil.
- Industry watchers say that the reason India would not have found a place in the MSP grouping is because the country does not bring any expertise to the table.

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Shortest day on Earth

On 29th June 2o22, the Earth completed one full spin in 1.59 milliseconds less than its routine 24 hours. It was the shortest day recorded since the 1960s, when scientists first began to measure the Earth's rotational speed.

Earth's rotational speed is measured using the precise atomic clocks.

- Recording a fast spinning Earth is not the first time.
- While the Earth has been completing its rotations faster in recent years, when looked at over a much longer period of time, our planet is actually spinning slower.
- Every century, the Earth takes a few milliseconds longer to complete one rotation - and on average, days are actually getting longer.
- So, 1.4 billion years ago, a day would have ended in less than 19 hours.
- The larger trend of the Earth's slower spin is mostly attributed to the **gravitational pull of the Moon**, which causes tidal friction and slows down the Earth's rotations.
- **Reason for getting shorter days -** It is hypothesized that climate change-induced surface variations, which impact the way that the Earth spins, could be a reason.
- These surface variations include melting ice sheets in Greenland and Antarctica, as well as changes in ocean circulation.

Activities that push mass towards the centre of the Earth will hasten the planet's rotation, while anything that pushes mass outwards will slow down the spin.

- Some experts suggest that the shortened length of the day could be related to the '**Chandler wobble**', a phenomenon that refers to the small deviation in the movement

of Earth's geographical poles.
- This wobble has recently diminished and could be the reason behind shorter days.
- The normal amplitude of the Chandler wobble is about three to four metres at Earth's surface, but from 2017 to 2020 it disappeared.
- Among the many processes that affect the speed of the Earth are movements in the planet's outer layers or inner molten core, seismic activity, wind speed, ocean currents, and shifting atmospheric gases.
- Some of these factors can act to speed the planet up, while others literally drag it down.

Adjustments

- To ensure that the time on clocks matches the speed of the Earth's rotation, a system of leap seconds has been used since the 1970s.
- They involve one-second adjustments to Coordinated Universal Time (UTC), the time standard used to synchronize clocks around the world.
- Due to the long-term slowing in the planet's spin, 27 leap seconds have been added to UTC.
- However, if the Earth continues to spin faster and days subsequently become shorter, scientists may have to introduce the first ever 'negative leap second,' which involves a subtraction of a second from clocks.

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Baumol's Cost Disease

- Economics theory states that wages rise when there's greater productivity.
- However, Baumol's cost disease refers to the increase in the wages of certain labourers even though their productivity or skill level has not risen commensurately.
- This happens because there is competition between various industries for the limited supply of labour.
- So, even if the productivity of their employees has not risen significantly, employers in many cases have no choice but to pay higher wages in order to prevent the movement of labourers to other higher-paying industries.
- It should be noted that labour is often a kind of non-specific resource that can be used across various industries.

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National Virtual Library of India

- Under the aegis of the National Mission on Libraries, National Virtual Library of India has been developed and launched as **Indian Culture Portal** (ICP) in **2019.**
- It was developed to showcase all forms of tangible and intangible cultural heritage of India.
- It was setup by the **Ministry of Culture**, Government of India.
- One of the major objective is to **collect, standardise and collate** all available digital assets and/or digital information about physical assets in an easily searchable form.

National Mission on Libraries

- The Union Ministry of Culture formulated the National Mission on Libraries (NML) scheme in 2012.
- It was formulated in pursuance of National Knowledge Commission recommendations for sustained attention for development of Libraries and Information Science Sector.

> *The National Knowledge Commission was constituted in 2005 to prepare a blueprint for reform of knowledge related institutions and infrastructure which would enable India to meet the challenges of the future.*

- The scheme consists of four components:
    1. Creation of National Virtual Library of India (NVLI)
    2. Setting up of NML Model Libraries
    3. Quantitative & Qualitative Survey of Libraries
    4. Capacity Building
- The Quantitative & Qualitative Survey of Libraries would be undertaken to prepare a baseline data of libraries in India through a survey of 5000 Libraries.

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