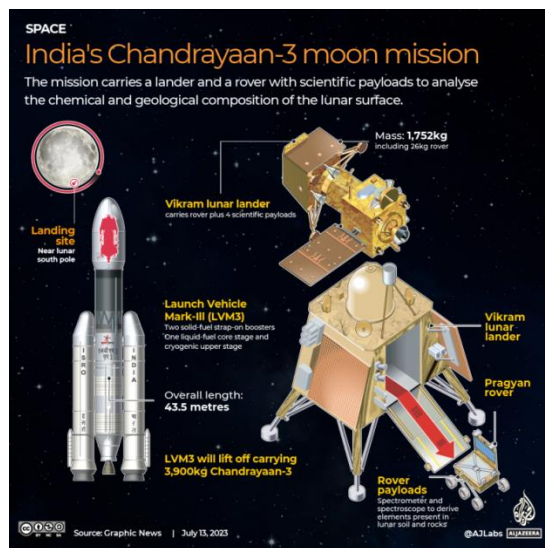


CHANDRAYAAN 3 MOON LANDING

'I reached my destination and you too!': Chandrayaan-3

Chandrayaan-3 has successfully soft-landed on the moon. Congratulations, India!



India became the fourth country in the world to have mastered the technology of soft landing on the lunar surface after the US, China, and the Soviet Union. The Lander Module landed on the moon on 23 August 2023 at the scheduled 06:04 PM. By doing so, India has also created history by becoming the one and only country to land at the south pole of the Moon.

Chandrayaan-3 consists of an indigenous Lander module (LM), Propulsion module (PM) and a Rover

with an objective of developing and demonstrating new technologies required for Inter planetary missions. The Lander will have the capability to soft land at a specified lunar site and deploy the Rover which will carry out in-situ chemical analysis of the lunar surface during the course of its mobility. The Lander and the Rover have scientific payloads to carry out experiments on the lunar surface.



The mission objectives of Chandrayaan-3 are:

- ❖ To demonstrate Safe and Soft Landing on Lunar Surface
- ❖ To demonstrate Rover roving on the moon and
- ❖ To conduct in-situ scientific experiments.

WHAT IS LUNAR POLAR EXPLORATION MISSION (LUPEX)?

In a joint effort, the space agencies of India and Japan are embarking on the Lunar Polar Exploration Mission (LUPEX).



About Lunar Polar Exploration Mission (LUPEX):

- It is a collaborative venture between **Japan Aerospace Exploration Agency (JAXA)** and the Indian Space Research Organisation (ISRO).
- The mission is scheduled to launch in **2025**.
- LUPEX will use a rover and lander to study the possibility of establishing a base on the Moon, the availability of water ice, and surface exploration technologies.
- JAXA and ISRO are developing the rover and lander, respectively.
- The rover will carry not only the instruments of ISRO and JAXA but also those of the US space agency **NASA** and the **European Space Agency (ESA)**.

Proposed instruments onboard LUPEX:

- Ahmedabad-based **Physical Research Laboratory (PRL)**, an autonomous unit of the Department of Space, has proposed multiple instruments in the LUPEX mission mainly to carry out measurements on the surface and subsurface near the permanently shadowed polar region of the Moon.
- The objective of one of the proposed instruments — Permittivity and Thermo-physical investigation for Moon's Aquatic Scout (**PRATHIMA**) — is in-situ detection and quantification of water-ice mixed with lunar surface and sub-surface soil using a rover/lander platform.
- The aim of another proposed instrument — the **Lunar Electrostatic Dust EXperiment (LEDEX)** — is to detect the presence of charged dust particles and to confirm the dust levitation process in the volatile-rich polar region, and to estimate the approximate dust size and flux of charged levitated dust particles.
- The mission will provide valuable insights into the lunar polar region and will help to pave the way for future human exploration of the Moon.

WHAT IS SEAMLESS M4T?

Meta, the technology company formerly known as Facebook, recently unveiled an advanced multilingual multimodal AI translation and transcription model named 'SeamlessM4T.'



About SeamlessM4T:

- SeamlessM4T, which stands for Massively Multilingual and Multimodal Machine Translation, is an advanced multilingual multimodal AI translation and transcription model.

- It was developed by **Meta**, the technology company formerly known as Facebook.
- SeamlessM4T is capable of performing various tasks including speech-to-text, speech-to-speech, text-to-speech, and text-to-text translations.
- **SeamlessM4T supports:**
 - Speech recognition for nearly 100 languages;
 - Speech-to-text translation for nearly 100 input and output languages;
 - Speech-to-speech translation, supporting nearly 100 input languages and 36 (including English) output languages;
 - Text-to-text translation for nearly 100 languages;
 - Text-to-speech translation, supporting nearly 100 input languages and 35 (including English) output languages;
- **Other Features:**
 - SeamlessM4T brings together diverse spoken data sources to provide a comprehensive multilingual and multimodal translation experience from a single model.
 - It performs the entire translation task in one go, unlike other large translation models that divide translation across different systems.
 - It has the ability to recognise when a speaker is code-switching or when someone moves between two or more languages in one sentence.
 - It also recognises gender bias in languages, and the model can quantify gender bias in translations.

WHAT IS MAITRI SETU?

India-Bangladesh friendship bridge, the Maitri Setu, is all set to be functional soon.



About Maitri Setu:

- It has been built over the **Feni River**, which flows between the Indian boundary in Tripura and Bangladesh.
- **Length:** It spans 1.9 kilometres joining Sabroom (in **Tripura**) with Ramgarh in Bangladesh.
- The name '**Maitri Setu**' symbolises growing bilateral relations and friendly ties between India and Bangladesh.
- The construction of the bridge has been overseen by National Highways and Infrastructure Development Corporation Ltd.
- It is a pre-stressed concrete bridge. It has a single-span structure that allows for the smooth flow of traffic and cargo.

Key Facts about Feni River:

- It forms part of the **India-Bangladesh border**.
- **Origin:** It originates in the South Tripura district, passes through Sabroom town on the Indian side, and meets the Bay of Bengal after it flows into Bangladesh.
- **Length:** It is 116 kilometres in length from its source to the Bay of Bengal.
- **Tributaries:** Some of the notable tributaries of the Feni River include the Muhuri River, Raidak River, Chandkhira River, Ryang River and Kushiara River.

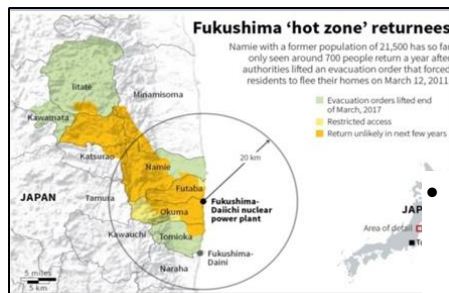
FUKUSHIMA NUCLEAR PLANT WILL START RELEASING TREATED RADIOACTIVE WATER TO SEA

Why in news?

- Japan said that it will start releasing more than 1 million metric tonnes of treated radioactive water from the wrecked Fukushima nuclear power plant on Aug 24.
- This has been termed as a controversial step. However, the government says it is essential to clean up the plant facility that had reactor meltdowns 12 years ago.

- As per the govt, the release of the water is a key step in the plant decommissioning and Fukushima prefecture's recovery from the March 11, 2011, earthquake and tsunami disaster.

Fukushima nuclear disaster



In March 2011, after a magnitude 9 earthquake, a tsunami flooded the Fukushima Daiichi nuclear power plant in Okuma and damaged its diesel generators.

- The loss of power suspended coolant supply to reactors at the facility; the tsunami also disabled backup systems. This led to Fukushima disaster.
- Soon, radioactive materials leaked from reactor pressure vessels, exploded in the facility's upper levels, and exposed themselves to the ambient air, water, soil, and local population.
- Winds also carried radioactive material thrown up into the air into the Pacific.
- Since then, the power plant and its surrounding land have been uninhabitable.

Why this move of Japanese govt. is being opposed?

- **No known threshold**
 - Japanese officials claim that the water will be treated before its release. However, experts claim that there is no known threshold below which radiation can be considered safe.
 - Any discharge of radioactive materials will increase the risk of cancer and other known health impacts to those who are exposed.
- **Difficult to remove tritium from the water**
 - Removing tritium from the water is a very difficult task.
 - tritium (T, or $3H$) is the isotope of hydrogen with atomic weight of approximately 3.
 - But removal of tritium is necessary as it is easily absorbed by the bodies of living beings and rapidly distributed via blood.
- **Impact on marine lives and livelihoods of the fisherfolk in the region**
 - Experts expect the affected water to poison the fish.

- South Korea banned seafood imported from around Fukushima, to Japan's displeasure, from 2013.
- **Impact on Pacific Ocean**
- There are concerns about the waterbody as well as the region.
- China, South Korea, Taiwan and Pacific Islands Forum have expressed concerns over this.
- Researchers across the world have also called for more studies to understand the precise composition of each tank before it is flushed.

What are Japan's other options?

- **Store the water for longer and then discharge it.**
- This is because tritium's half-life – the time it takes for its quantity to be halved through radioactive decay is 12-13 years.
- The quantity of any other radioactive isotopes present in the water will also decrease in this time.
- So, at the time of discharge, the water could be less radioactive.

What does the experts say on this step?

- The International Atomic Energy Agency in a final report in July concluded that the release, if conducted as designed, will cause negligible impact on the environment and human health.
- Scientists generally support the IAEA view, but some say **long-term impact of the low-dose radioactivity that remains in the water needs attention.**

PM MODI IN SOUTH AFRICA FOR BRICS SUMMIT

- Prime Minister Narendra Modi landed in South Africa to take part in the three-day BRICS summit that begins from 22 August.
- The 15th BRICS Summit is being hosted by South Africa.
- This will be the **first in-person BRICS summit since 2019**; the last three were held online because of the COVID pandemic.

BRICS

- BRICS brings together 5 major emerging economies - Brazil, Russia, India, China and South Africa.

- BRICS as a platform represents **42% of the world population, 30% of the world's territory, 23% of global GDP, and around 18% of world trade.**

Timeline

- **2001** -British economist Jim O'Neill of Goldman Sachs coined the term 'BRIC'.
 - He coined the term to highlight the potential of these four economies from an investors' interest perspective.
- **2006** - An informal meeting of the grouping was held among Russia, India, and China on the sidelines of the G8 Outreach Summit in Russia.
- **2009** – First BRIC's summit was held in Russia.
- **2010** – South Africa became the member and BRIC became BRICS.
- **2015** – National Development Bank, also known as BRICS Bank, was launched.

• **Significance**

- First in-person summit since 2019 and the COVID-19 pandemic.
- First in-person meeting since the Russian invasion of Ukraine in 2022.
 - This war has cast a long shadow not only over global stability, but food, fertilizer and fuel (energy) security.
- It will be of importance as the U.S. and EU still hope to try and isolate Russia over the conflict.

15th BRICS summit: Significance for India

- This will be the first in-person summit since the military standoff with China at the Line of Actual Control began in 2020.
- Just over two weeks after the BRICS summit, India will host the G20 summit.
- In this context, Prime Minister Modi will want to ensure full attendance by the leaders, which include all BRICS members.
- Also, India wants more cooperation from China and Russia that are blocking discussions on a common language for the Leader's declaration to be released at the G20 summit.
 - India might use the BRICS forum for talks on the issues over the paragraphs on Ukraine, climate change, debt financing and others that are being held up by their objections.

YOUNG INDIANS BUT AGING WORKFORCE

Context

- While addressing the nation on Independence Day, the Prime Minister made a special mention to India being a youthful nation and highlighted the opportunities before India's youth.
- However, an analysis of India's workforce, sourced from CMIE's Economic Outlook data, shows that while India may be the country with the most youthful population, its workforce is rapidly aging.

Meaning of 'India's Workforce is Aging': An ageing workforce basically means that if one looks at all the employed people in India, the share of young people is going down while the share of those closer to 60 years of age is going up.

Reason Behind Aging India's Workforce: Youth is Out of the Job Market

- Despite the increasing numbers, the youth is getting driven out of the job market.
 - A good way to track this is to look at the metric called "Employment Rate."
 - The Employment Rate (ER) for any population or age group tells us what proportion of that age group or population is employed.
 - So, if there are 100 people in the ages 15 to 29 and only 10 are employed then the ER would be 10%.

Conclusion

- India has large youth population as compared to other developing nations, however, if India remains unable to give them employments can make the situation worse.
- Unless these trends are reversed, India may continue to experience the rather counterintuitive phenomenon of being a youthful country with an ageing workforce.

BHARAT NCAP (NEW CAR ASSESSMENT PROGRAMME)

Recently, the Union Minister of Road Transport and Highways launched the Bharat New Car Assessment Programme (Bharat NCAP) in New Delhi.



About Bharat NCAP (New Car Assessment Programme):

- It is a significant step forward in the government's commitment to improving road safety by raising the **safety standards of motor vehicles up to 3.5 tonnes in India.**
- The programme aims to **provide a tool for car customers** to make a comparative assessment of the crash safety of motor vehicles available in the market.
- Under this programme, car manufacturers can voluntarily offer their cars tested as per **Automotive Industry Standard (AIS) 197.**
- Based on the performance of the car in the tests, the car will be awarded **star ratings for Adult Occupants (AOP) and Child Occupants (COP).**
- To receive a **5-star rating**, a vehicle needs at least 27 points in adult occupant protection and requires 41 points in child occupant protection.
- These protocols are **in line with Global NCAP** norms when it comes to crash testing.
- Three tests, including offset deformable barrier **frontal impact test, side impact test, and pole side impact test** -- would determine the crashworthiness of the vehicles.
- It would also mandate the **installation of six airbags, electronic stability control (ESC), three-point seatbelts for every passenger**, improved emergency braking systems, etc.
- For Bharat NCAP, the frontal crash test will be conducted at a speed of 64km/h. On the other hand, the side and pole-side impact tests will be done at 50km/h and 29km/h
- These norms will also be **applicable for testing and rating CNG and EVs** based on their performance.
- Unlike Global NCAP, Bharat NCAP **will give a unified rating for the vehicles**, combining crash test results for adults and children alike.