

## Prelim Bits 21-06-2023 | UPSC Daily Current Affairs

### Hindu Kush Himalayan Mountain Ranges

*A recent study shows that if global warming isn't controlled Himalayan glaciers could lose 80% of their volume.*

- **Location** - It is the great mountain system of Central Asia.
- It spreads across 8 countries - Afghanistan, Bangladesh, Bhutan, China, India, Nepal, Myanmar and Pakistan.
- **Boundaries** - It runs northeast to southwest and divides the valley of the Amu Darya to the north from the Indus River valley to the south.
- To the east the Hindu Kush supports the **Pamir range** near the point where the borders of China, Pakistani-controlled Kashmir, and Afghanistan meet.
- The eastern end of the Hindu Kush in the north merges with the Karakoram Range.
- It runs southwest through Pakistan and into Afghanistan, finally merging into minor ranges in western Afghanistan.
- **Peaks and ranges** - The highest peak is **Mount Tirich Mir**, which rises near the Pakistan-Afghanistan border.
- Towards its southern end, it connects with the Spin Ghar Range near the Kabul River.
- **Water source** - Hindu Kush Himalayas are the world's most important 'water tower', being the source of 10 of Asia's largest rivers.
- It is the **Earth's 3<sup>rd</sup> Pole** as it's the storehouse of the 3<sup>rd</sup> largest body of snow on our planet after the Antarctic and the Arctic.
- **Other significance** - The Hindu Kush Mountains were centers of Buddhism, including the Bamyán Buddha.
- It has also been a gateway for invasions into the Indian subcontinent, a growing region for the Taliban and al-Qaeda, and a theater of modern warfare in Afghanistan.



## Reference

[The Indian Express | Himalayan glaciers could lose 80% of their volume](#)

[Down to Earth | Climate change affecting biodiversity in Hindu Kush](#)

[Down to Earth | ICIMOD report warning for rivers of East, Northeast India](#)

## GEMCOVAC-OM

*India's first indigenous mRNA vaccine (GEMCOVAC-OM) for the Omicron variant, was approved under emergency use guidelines by the Drug Controller General of India.*

- **Developed by** - Pune-based Gennova Biopharmaceuticals Ltd.
- **Features** - It is India's first mRNA vaccine developed to address the problems in the earlier approved mRNA vaccines.
- This mRNA-based vaccine uses spike protein of the omicron variant (BA.1) of the SARS- CoV-2 as an antigen.
- It was stable in a 2-8 °C range and could therefore be stored in ordinary refrigerators.
- The vaccines could be administered as an intradermal (ID) injection only (into the skin) via a "*needle-free*" *PharmaJet system*.
- It is tested at the National Institute of Virology (NIV) against the newest (Omicron subvariant), XBB 1.16, and it is shown to be effective.
- It is indicated as a single booster dose in individuals aged more than 18 years administered at least 4 months after completion of primary vaccination with either

Covishield or Covaxin.

*mRNA is a molecule that contains the instructions or recipe that directs the cells to make a protein using its natural machinery.*

### **m-RNA based vaccine technology**

- mRNA vaccines work by introducing a piece of mRNA that instructs the cells to produce the *viral protein*.
- As part of a normal immune response, the immune system recognizes that the protein is foreign and produces specialized proteins called *antibodies*.
- Antibodies protect the body against infection by recognizing individual viruses or other pathogens, attaching to them, and marking the pathogens for destruction.
- Once produced, antibodies remain in the body, even after the body has rid itself of the pathogen.
- If a person is exposed to a virus after receiving mRNA vaccination for it, antibodies can quickly recognize it, attach to it, and mark it for destruction before it can cause serious illness.
- Individuals who get an mRNA vaccine are *not exposed to the virus, nor can they become infected with the virus by the vaccine*.

<b>mRNA based vaccines</b>	<b>Developed by</b>
GEMCOVAC™ -19	India
Pfizer-BioNTech	USA
Moderna COVID-19	USA

Company	Doses	Storage
 Pfizer (BioNTech)		 -80 to -60°C (6 months) and 2 to 8°C (for up to 5 days)
 Moderna		 -25 to -15°C (6 months) and 2 to 8°C (for 30 days)

### **References**

[The Hindu | Regulator approves first Omicron-specific mRNA vaccine](#)

[The Indian Express | India's first mRNA-based Omicron-specific booster vaccine](#)

### **Submersible vs Submarine**



*The Titan, one of the crewed submersibles operated by OceanGate, went missing in the area of the Titanic wreck in the North Atlantic.*

## Titan

- Titan is the only crewed submersible in the world that can take 5 people as deep as 4,000 meters enabling it to reach almost 50% of the world's oceans.
- It is made of carbon fiber and titanium.
- The submersible was part of an 8-day journey conducted by OceanGate Expeditions to reach the Titanic wreck site.
- The wreck site is about 900 miles off the coast of Cape Cod, Massachusetts.
- Once submerged, the platform uses a patented motion-dampening flotation system to remain coupled to the surface that provide a stable underwater platform.
- At the conclusion of each dive, the sub lands on the submerged platform and the entire system is brought to the surface in approximately 2 minutes by filling the ballast tanks with air.

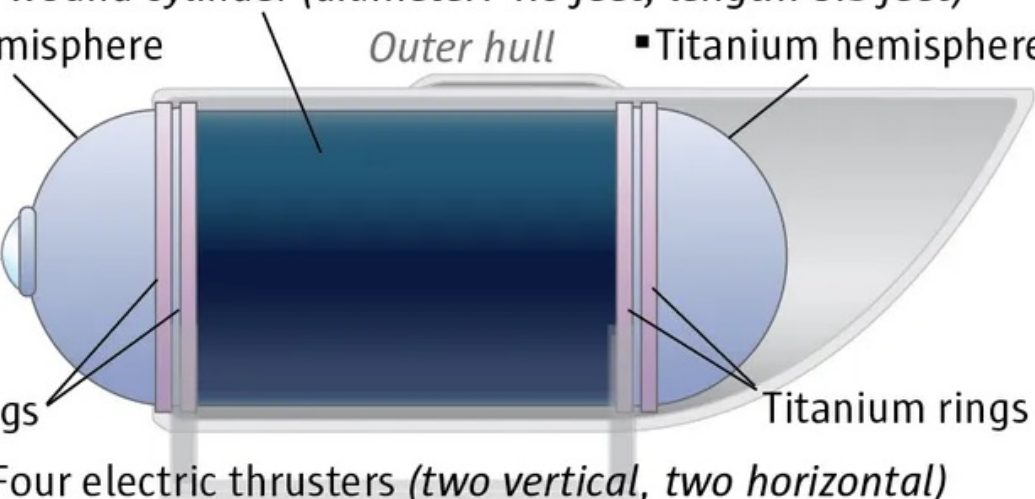
## Titan: Manned submersible

Designed and built by OceanGate, Titan is a Cyclops-class manned submersible able to dive to depths of 13,123 feet with a crew of five and can carry up to five people. It is designed to be used for site survey and inspection, research and data collection, film and media production, and deep sea testing of hardware and software.

- Capacity: **Five** (*one pilot, four crew*)
- Life support: **96 hours for five passengers**
- Maximum depth: **13,123 feet**

### PRESSURE VESSEL MATERIAL

- Carbon-fiber-wound cylinder (*diameter: 4.6 feet, length: 8.3 feet*)
- Titanium hemisphere
- Titanium hemisphere
- Viewport
- Titanium rings
- Titanium rings
- Propulsion: Four electric thrusters (*two vertical, two horizontal*)



## Submersible

- A submersible is a small boat or other craft, designed especially for research and exploration.
- It does not function as an autonomous craft and *needs a mother ship* that can launch and recover it.
- The submersibles have a top speed of 3 knots (5.5 kmph).
- It can't stay underwater for as long compared to submarines.
- Since there is no GPS underwater, the submersible is only *guided by text messages* from the surface ship.
- The pilot steers the sub using a video game controller but if that fails, a hard-wired system can control the propellers.

## Submarines

- A submarine is a watercraft capable of *independent operation underwater*.
- It refers to any naval vessel that is capable of propelling itself beneath the water as well as on the water's surface.
- When submarine is to dive, water is filled in water tanks and it is made heavier.
- Since the average density of submarine becomes greater than the density of sea water, it sinks.
- To make the submarine rise to the surface of water, water tanks are emptied.

## Reference

[The Indian Express | Titanic tourist submersible missing](#)

## Lake Victoria Basin

*A recent report shows that heavy rains, wind storms, and floods threaten the survival and water access of the communities living in the Lake Victoria Basin (LVB), East Africa.*

- **Location** - Lake Victoria Basin is situated at East Africa.
- **Features** - Lake Victoria is the
  - Largest freshwater lake in Africa
  - World's largest tropical lake
  - Second largest freshwater lake in the world, after *Lake Superior* in North America
  - Largest inland water fishery sanctuary in East Africa
- **Climate** - It has modified equatorial climate, regional rainfall regulates the water levels in the lake.
- Most of the lake's water comes from rainfall, while almost the same amount of water is lost through evaporation and carried out by the Nile.
- **Associated countries** - The basin's catchment area traverses through 5 East African Countries - Tanzania (44%), Kenya (22%), Uganda (16%), Rwanda (11%) and Burundi (7%).
- This trans-boundary asset is shared by Tanzania (51%), Uganda (43%) and Kenya (6%).

- **Rivers** - A number of important rivers flow into Lake Victoria including the River Mara, Kagera, Yala, Nyando, Bukora and Katonga.
- The White Nile is the only river flowing out of the Lake.
- The Kagera (Akagera) River, which drains the mountains of Burundi and Rwanda, is considered as the source of the Nile.



## Reference

[Down to Earth | Measures needed to minimise disaster impact in Lake Victoria Basin](#)

## Multi-cap Funds

*Multi-cap funds with equity exposure of 25% each in the large-, mid- and small-caps have delivered better returns in the last few years.*

- Multi Cap Funds invest their corpus in a portfolio of equity and equity-related stocks of companies with varying market capitalizations.
- Their portfolio comprises of large cap, midcap and small cap stocks.
- Multi-cap funds allocate 75% of the fund assets to equities and related instruments, with **at least 25%** in each of the large, medium, and small capitalizations as per the SEBI mandate.
- They are relatively *less risky* compared to a pure mid cap or a small cap fund but are *riskier* than those of large cap funds.
- **Types of Multi-Cap Funds**
- **Large cap** - It refers to the top 100 publicly listed companies in India by full market capitalization

- **Mid cap** - It refers to the 101st to 250th company in terms of full market capitalization
- **Small caps** - 251st company onwards in terms of full market capitalization.

*Market capitalization = No. of publicly listed shares x Price of each share*

### **Advantages of Multi Cap Funds**

- Exposure to all key sectors driving the Indian economy forward
- Ideal for an investment horizon of 5+ year
- Eliminates the need for buying different funds for comprehensive market coverage
- Provide a perfect blend of all capital markets that allows to earn good interest balancing the risks and returns.

### **Reference**

[The Hindu Businessline|multi-cap-funds-deliver-better-returns-in-volatile-times](#)

