

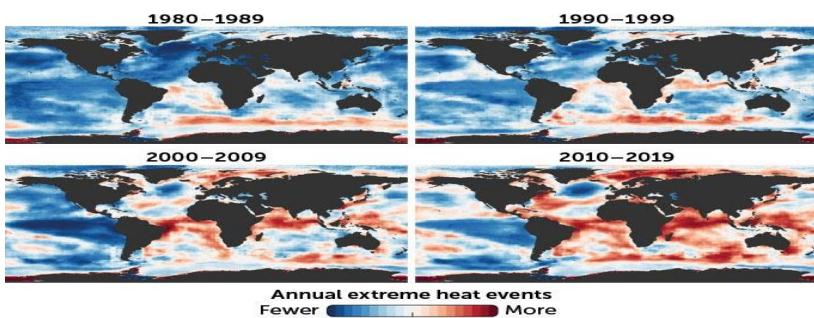
## Ocean warming

### ❖ Context

- A new analysis of monthly surface ocean temperatures over the past 150 years (1870-2019) reveals shocking results that then, in 2014, the entire ocean hit the “point of no return”

### ❖ Key Highlights

- Beginning in 2014, more than half of the ocean began to reach extremes hotter than even the most extreme events from 1870 to 1919. **Marine heat waves** are defined as at **least five days of unusually high temperatures** for a patch of ocean. Heat waves wreak havoc on ocean ecosystems, leading to seabird starvation, coral bleaching, dying kelp forests, and migration of fish, whales and turtles in search of cooler waters



### ❖ According to an another modeling study,

- **By 2080, around 70% of the world's oceans could be suffocating** from a lack of oxygen as a result of climate change. The new models predict that **deoxygenation** is expected to begin affecting **all zones** of the ocean by 2080.
- The **ocean's middle depths (from about 200 to 1,000 meters deep)**, called **mesopelagic zones**, will be the **first zones** to lose significant amounts of oxygen due to climate change
- Globally, the mesopelagic zone is home to many of the world's commercially fished species. The middle layer of the ocean is particularly vulnerable to deoxygenation because it is **not enriched with oxygen** by the atmosphere and photosynthesis like the top layer, and the most **decomposition of algae** -- a process that consumes oxygen -- occurs in this layer.

## Motion of Thanks

### ❖ Context

- Recently, a **debate on Motion of Thanks** to the President's Address was held in Lok Sabha.

### ❖ Key Highlights

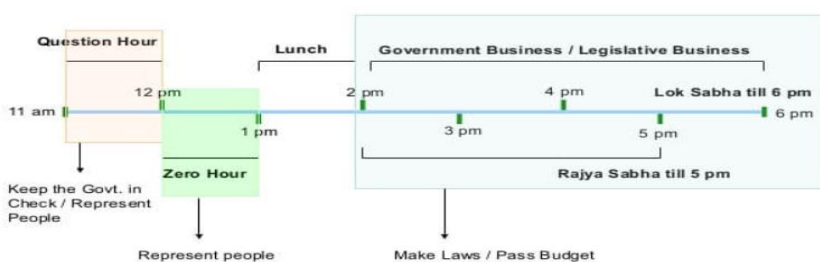
- The President's speech at the start of the Budget Session usually **highlights the government's achievements** over the past year and **outlines targets and plans for the future**.

### ❖ About Motion of Thanks

- The President makes a special address (a statement of government policy that has to be approved by the Cabinet) to a **joint sitting of both Houses**.
- The address is followed by a motion of thanks **moved in each House** by ruling party MPs, and this is called 'Motion of Thanks'.
- During the session, political parties discuss the motion of thanks also **suggesting amendments**.
- **No other business is transacted** till the President has addressed both Houses of Parliament assembled together.

### ❖ Constitutional Provisions

- President's Address and Motion of Thanks are governed by **Articles 86 (1) and 87 (1)** of the Constitution and Rules 16 to 24 of the Rules of Procedure and Conduct of Business in Lok Sabha.
- Such an Address is called '**special address**', and it is also an annual feature.



### ❖ Amendments to the “Motion of Thanks-

- **Notices of amendments** to Motion of Thanks on the President's Address can be tabled after the President has delivered his Address.
- Amendments may refer to **matters contained in the Address** as well as to matters, in the opinion of the member, the Address has failed to mention.
- Amendments can be moved to the Motion of Thanks in such **form as may be considered appropriate by the Speaker**.

### ❖ Limitations-

- Members cannot refer to matters which are **not the direct responsibility of the Central Government**.
- The **name of the President cannot be brought** in during the debate since the Government and not the President is responsible for the contents of the Address.

### ❖ Significance

- Members of Parliament vote on this motion of thanks. This **motion must be passed in both of the houses**.
- A **failure to get motion of thanks passed** amounts to **defeat of government** and leads to collapse of government. It is one of the ways through which the Lok Sabha can also express a lack of confidence in the government. The other ways are:
  - Rejection of a money bill.
  - Passing a censure motion or an adjournment motion.
  - The defeat of the government on a vital issue.
  - Passing a cut motion.

## Face to Face Centres



## Reduction of snow cover in Himachal Pradesh

### ❖ Context

- According to a recent report published by the Centre on Climate Change of HP Council for S&T and Environment and the Space Application Centre, Ahmedabad, the area under snow cover in HP has **declined by 18.5 % or 4,000 sq km**

### ❖ Key Highlights

- The decline has occurred in all river basins of the state including Chenab, Beas, Ravi & Sutlej
- Since, **Sutlej basin** covers 45% of the state area, the **maximum decline** has been observed in it
- Apart from global warming, local conditions have also added to the phenomenon
- Construction of dams post-independence has been rampant in state
- The stagnant dam water collects debris from villages and trees inside. **Decomposing plant matter** leads to the production of **methane gas** which is 34 times more potent than carbon dioxide
- Further, as the water receives heat from the sun, it forms **mist** which further **causes snow to melt** due to release of latent heat of condensation

## Chandrayaan 3

### ❖ Context

- Indian Space Research Organization (ISRO) will make its third venture to the Moon through the **Chandrayaan-3 mission in August this year.**

### ❖ About Chandrayaan-3

- Chandrayaan 3 configuration will be **similar to that of its predecessor** (Chandrayaan 2) with a lander, rover and a propulsion module.
- It **won't require an orbiter.**
- ISRO is planning to land the Chandrayaan 3 lander at the same location as the Chandrayaan 2 – the **lunar south pole**, which is a singularly promising part of the moon's surface.
- If successful, it will make **India the fourth country** to soft-land a spacecraft on the Moon after the **United States, USSR and China.**

### ❖ Lunar South pole

- It is interesting because the lunar surface area that **remains in shadow** is much **larger than that at the North Pole.**
- There could be a **possibility of presence of water in permanently shadowed areas** around it.
- In addition, the **South Pole region has craters that are cold traps** and contain a **fossil** record of the early Solar System.



### ❖ Information Gathered till Now

- Presence of **water molecules and minor elements** (Chromium, manganese and Sodium) on the moon.
- Information about **solar flares**

### ❖ About Chandrayaan-2

- It was launched by a **GSLV Mk III on 22 July 2019**, months after China's successful soft-landing attempt.
- The mission had three components; an orbiter, a lander (**Vikram**) and a rover (**Pragyan**) and was designed to expand lunar scientific knowledge through the detailed study of the Moon's surface and atmosphere.
- The orbiter was successfully injected into the moon's orbit. However, the lander, which was initially descending as planned, lost communication nearly two kilometers from the surface on 6 September 2019.
  - It was later revealed that **the Vikram lander had hard-landed on the moon** because of a problem with the lander's braking thrusters.

## Param Paravega Supercomputer

### ❖ Context

- Recently, The **Indian Institute of Science (IISc)** has installed and commissioned the **Param Pravega Supercomputer.**

### ❖ Key Highlights

- It is one of the most **powerful supercomputers** in India, and the largest in an Indian academic institution under the **National Supercomputing Mission (NSM).**

### ❖ About NSM

- The mission was **announced in 2015.**
- NSM envisaged **setting up a network of 70 high-performance computing facilities** with an aim to connect national academic and R&D institutions across India over a seven-year period at an estimated cost of Rs 4500 Crores.

## Face to Face Centres

- The system, which is expected to power diverse research and educational pursuits, **has a total supercomputing capacity of 3.3 petaflops** (1 petaflop equals a quadrillion or 10<sup>15</sup> operations per second).
- It has been **designed by the Center for Development of Advanced Computing (C-DAC)**, e country.
- A majority of the components used to build this system have been **manufactured and assembled within the country**, along with an indigenous software stack developed by C-DAC, in line with the **Make in India initiative**.
- These systems will greatly help faculty members and students carrying out major **R&D activities**, including developing platforms for genomics and drug discovery, studying urban environmental issues, establishing flood warning and prediction systems, and optimizing telecom networks
- In 2015, the Institute procured and installed **SahasraT**, which was at that time the fastest supercomputer in the country.

- **Implementing Body:** Ministry of Electronics and IT (**MeitY**) and Department of Science and Technology (**DST**).
- **Nodal Agencies of NSM– (C-DAC) and (IISc),**
- Under NSM, the long-term plan is to build a strong base of **20,000 skilled persons over the next five years** who will be equipped to handle the complexities of supercomputers.
- In 2020, a RTI reply revealed that India has produced just three supercomputers since 2015 under NSM
  - **PARAM Shivay** installed in IIT-BHU, Varanasi with 837 TeraFlop capacity
  - Second one at IIT-Kharagpur with 1.66 PetaFlop capacity
  - **PARAM Brahma** at ISER-Pune, has a capacity of 797 TeraFlop

## News in Between the Lines

### Swachhta Saarthi Fellowship 2022

#### ❖ Context

- The Office of the Principal Scientific Adviser to the Government of India under its **“Waste to Wealth”** Mission announced the **“Swachhta Saarthi Fellowship 2022”**

#### ❖ Key Highlights

- The Waste to Wealth Mission is one of the nine national missions of the **Prime Minister’s Science, Technology, and Innovation Advisory Council (PM-STIAC)**
- The fellowship was **launched in 2021** to recognize students, community workers/self-help groups, and municipal/sanitary workers who are engaged in tackling the enormous challenge of waste management, scientifically and sustainably.
- Up to 500 fellows will be recognised under the fellowship.
- The fellowship is aimed at amplifying the role of young students from schools and colleges, and citizens working in the community through Self Help Groups (SHGs), or in independent capacity in **sensitizing the society** towards waste management and offer innovative solutions for conversion of waste to value.
- The other eight missions under PM-STIAC are - **Natural Language Translation, Quantum frontier, AI, National Biodiversity, EV, Bioscience for human health, Deep Ocean Exploration & AGNli**



#### ❖ Context

- Analyses of satellite images from the European Space Agency’s **Tropospheric Monitoring Instrument, or TROPOMI** from 2019 and 2020 reveal that a majority of the 1,800 biggest methane sources come from six major oil- and gas-producing countries: **Turkmenistan** led the pack, followed by **Russia, the United States, Iran, Kazakhstan and Algeria**.

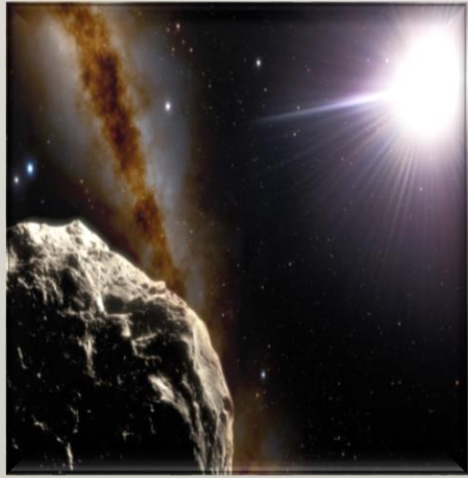
#### ❖ Key Highlights

- These big leaks amount to an estimated **8 to 12 percent of total annual methane emissions**
- **Ultra-emitters are sources that spurt at least 25 metric tons of methane per hour** into the atmosphere.
  - Plugging those leaks would not only be a boon to the planet, but also could save those countries billions in U.S. dollars
  - In oil and gas production, massive methane bursts might be the result of accidents or leaky pipelines or other facilities,
  - Stopping such practices and repairing leaky facilities are relatively easy, which is why such changes may be the low-hanging fruit when it comes to addressing greenhouse gas emissions.

### World’s methane ‘Ultra emitters’



## 2020 XL5



### ❖ Context

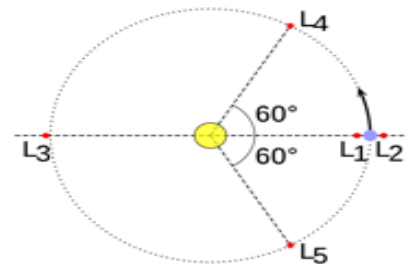
- Scientists have found **Earth's second known 'Trojan Asteroid'**

### ❖ Key Highlights

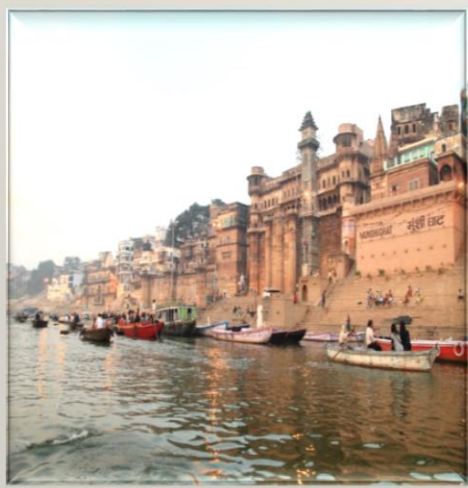
- Trojan asteroids, which are also found accompanying Mars, Jupiter and Neptune, hang out in two locations (L4 and L5) near a planet where the gravitational pulls of that planet and the sun balance each other
- In 2010, astronomers discovered the first known Earth Trojan — called **2010 TK7** — orbiting within one of these two regions, known as L4
- The newly found asteroid is **1 km wide** and is also at L4.
- It will hang around at L4 for at least **4,000 years**. **2010 TK7**, for comparison, will stick around for some **10,000 years**.

### ❖ Lagrange Points

- Normally, the two massive bodies exert an unbalanced gravitational force at a point altering the orbit of whatever is at that point. At the Lagrange points, the gravitational forces of the two large bodies and the centrifugal force balance each other.
- There are **five such points**, labeled L<sub>1</sub> to L<sub>5</sub>, all in the orbital plane of the two large bodies



## River Cities Alliance



### ❖ Context

- Recently, the **River Cities Alliance (RCA)** has been launched by the Ministry of Jal Shakti and the Ministry of Housing and Urban Affairs.

### ❖ Key Highlights

- **Objective-**
  - To provide the member cities with a platform to discuss and exchange information on aspects that are vital for sustainable management of urban rivers, sharing best practices and supporting innovation.
- The alliance has been launched initially with **30 cities** namely Dehradun, Rishikesh, Haridwar, Srinagar, Varanasi, Kanpur, Prayagraj etc.
- The Alliance is **open to all river cities of India**. Any river city can join the Alliance at any time.
- **State Governments are implementing Action Plans** for restoration of water quality of the identified polluted river stretches.
- The implementation is being **monitored regularly at State level by Chief Secretary of the respective State/UT** and at Central level by the Central Monitoring Committee under the Chairmanship of Secretary, Ministry of Jal Shakti.

## Heli Borne Survey Tech



### ❖ Context

- The government recently said that the **Heli-borne survey for water management is likely to be completed by Mar 31**.

### ❖ Key Highligh

- **Central Ground Water Board (CGWB)** has taken up Heli-borne survey in certain Arid/Semi-Arid areas of Rajasthan, Gujarat and Haryana under Ground Water Management & Regulation scheme.

### ❖ About Heli-borne Survey Technology

- This technology has been developed by **CSIR-NGRI Hyderabad**.
- It will **provide high-resolution 3D image** for sub-surface up to a **depth of 500 meters below** the ground level and **map potential groundwater sources**.
- It is being **employed by SIR** to map groundwater sources in arid regions and utilize groundwater for drinking purposes.

### ❖ About Arid areas in India

- Arid areas in north western India are spread across the States of Rajasthan, Haryana, Gujarat and Punjab.
- The area covers about **12% of the total geographical area in India** and is home to about **8 crore people**.
- Annual rainfall in arid areas is in the **range of 100 to 400 mm**. Thus, there is an acute shortage of water throughout the year.

## Face to Face Centres

