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Solar Geoengineering

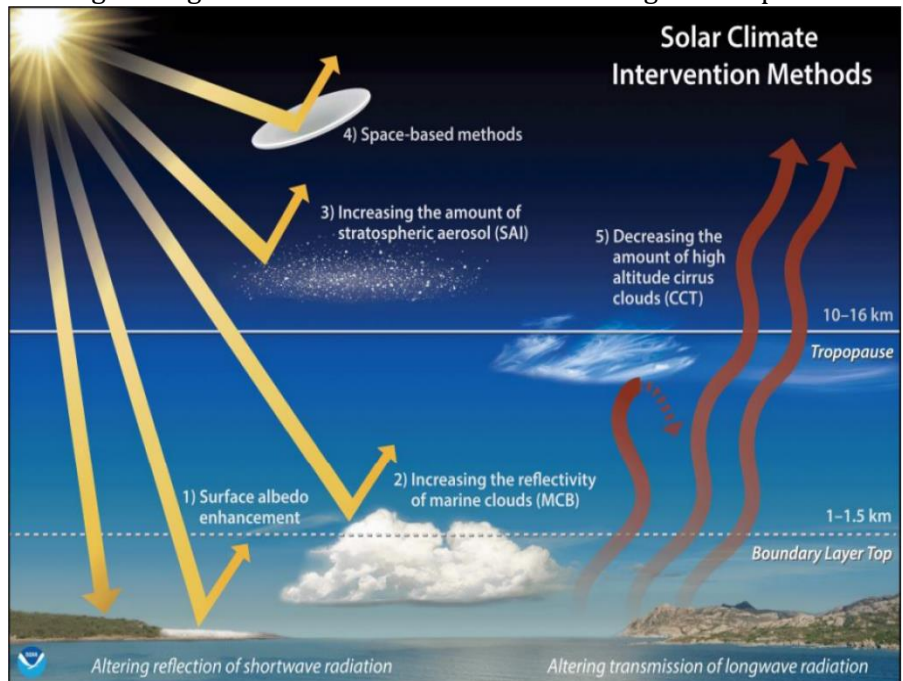
News: The United States is eyeing a controversial tool to counter global warming: Solar radiation management (SRM), which involves reflecting a small fraction of sunlight into space.

Background:

- In a report released June 30, 2023, the White House stated that public or private actors could carry out activities such as injecting aerosols and brightening marine clouds to reflect more sunlight into space.

What is Solar Geoengineering?

- Solar geoengineering is a type of climate engineering that aims to reflect some sunlight back into space to limit or offset human-caused climate change.
- There are different methods of solar geoengineering, such as **stratospheric aerosol injection (SAI)**, which involves injecting tiny particles into the upper atmosphere, and **marine cloud brightening (MCB)**, which uses sea salt to stimulate cloud formation over the ocean.
- Solar geoengineering is not a substitute for reducing greenhouse gas emissions, but a possible temporary measure to limit warming while emissions are reduced and carbon dioxide is removed.



What are the benefits of Solar Geoengineering?

- Reducing climate changes around the globe, such as extreme temperatures, changes in water availability, and intensity of tropical storms.
- Offsetting some of the warming from a doubling of CO₂.
- Cooling the poles more than the tropics, and thus slowing or stopping ice loss.
- Being affordable and feasible compared to other climate interventions.
- Lowering Earth's global temperature and offsetting the costs of global warming

What are risks of Solar Geoengineering?

- Shifts in weather patterns and creation of droughts in some regions due to changes in precipitation and atmospheric circulation
- Lower crop yields and hunger due to a less-intense sun, which could affect photosynthesis and plant growth.
- Possibility of catastrophic heat wave across the world if the spraying of aerosols is stopped abruptly, leading to a rapid rise in temperature
- Intensification of ozone depletion due to the interaction of aerosols with stratospheric chemistry.
- Threats to national security and international stability due to the unequal distribution of benefits and harms, as well as the potential for unilateral or rogue actions.
- Challenges related to issues of environmental justice and equity, such as who gets to decide, monitor, and regulate solar geoengineering, and who bears the costs and risks

Source – Washington Post, DTE

Rifleman Jaswant Singh Rawat

News: The **Lansdowne Cantonment Board** has decided to rename the hill station of **Lansdowne** in Uttarakhand, India, as **Jaswantgarh** in honour of Rifleman Jaswant Singh Rawat.

Who was Rifleman Jaswant Singh Rawat?

- Rifleman Jaswant Singh Rawat was an Indian Army soldier who served in the **Garhwal Rifles** and was awarded the prestigious **Maha Vir Chakra** posthumously as a result of his actions during the **battle of Nuranang** in present-day Arunachal Pradesh, India, during the Sino-Indian War.

What was his contribution in the Sino-India war?

- On 17 November 1962, he was part of the Delta company that was defending a post near Nuranang against the Chinese invasion. He volunteered to subdue a Chinese medium machine gun (MMG) that was firing accurately at their position. Along with two other soldiers, he managed to capture the MMG and kill five Chinese sentries, but lost his companions in the process. He returned with the captured weapon and continued to fight.
- When his company decided to fall back, **he refused to retreat** and stayed at his post **with the help of two local girls named Sela and Noora**, who supplied him with ammunition and food. He moved from bunker to bunker, firing at the enemy and creating an impression of a large force. He held off the enemy for 72 hours, **killing more than 300 Chinese soldiers**.
- He is revered as a hero and a legend by the Indian Army and the locals. A memorial has been built at his post, which is named **Jaswant Garh**. He is treated as a **servicing officer by the army**, with a hut, a bed, shoes, letters, and five jawans posted at his post.
- A **Buddhist temple** has also been constructed at the spot where he died. The Sela Pass and Sela Tunnel are named after Sela, one of the girls who helped him.

Who was Lord Lansdowne? What were some of his contributions?

- Lord Lansdowne was the Governor-General and Viceroy of India from 1888 to 1894.
- He introduced the **Indian Councils Act of 1892**.
- He **abolished the Statutory Civil Service** based on the recommendations of the Aitchison Commission (1889) and categorized the government's civilian officers into three classes – Imperial, Provincial and Subordinate Civil Service.
- He passed the **Age of Consent Act of 1891**, which raised the age of consent for sexual intercourse for all girls, married or unmarried, from **ten to twelve years** in all jurisdictions, with **violations punishable as rape**.
- He set up the **Durand Commission** (1893) to demarcate the border between British India and Afghanistan, which came to be known as the Durand Line.
- He issued a **royal commission** (1893) to inquire into the effects of opium consumption in India, and the possibility of prohibiting it.
- He established **Lansdowne as a cantonment town** in Uttarakhand in 1890, after renaming it from Kaludanda (Black Hills) **in honour of himself**. It became the headquarters of the Garhwal Rifles regiment, which he had raised in 1887.



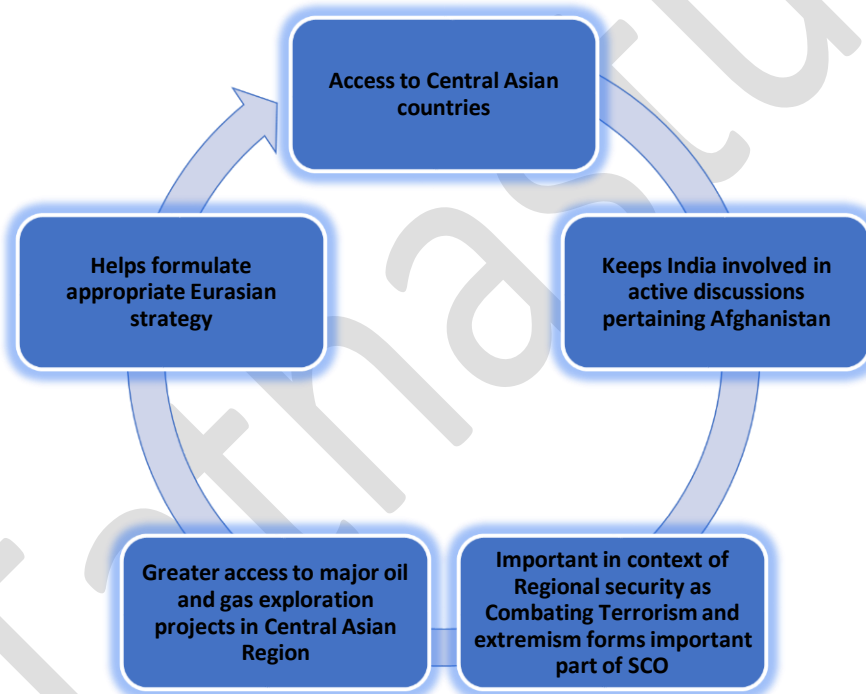
23rd SCO Summit – Key Outcomes

News: Recently, India hosted the 23rd Summit of the Shanghai Cooperation Organisation (SCO) Council of Heads of State in the virtual format.

Key Outcomes:

- **Iran** was inducted to the SCO grouping. It became the 9th member.
- India has once again refused to endorse China's ambitious **Belt and Road Initiative (BRI) scheme** which envisions rebuilding the old Silk Road to connect China with Asia, Europe and beyond with large infrastructure spending. India was the only country in the Shanghai Cooperation Organisation (SCO) not to support the project.
- India has also stayed out of a joint statement on SCO Economic Development Strategy 2030, indicating a lack of consensus in the grouping.
- PM Modi called out some countries that use cross-border terrorism as key instrument to fulfil their policies. PM Modi urged that SCO should not hesitate to criticize such nations because there can be no place for double standards on such serious matters.
- Delhi Declaration – Key outcome of the summit. The declaration proposes five joint statements – i) fight against terrorism ii) de-radicalisation iii) sustainable lifestyle to tackle climate change iv) production of millets and digital transformation. The declaration also listed a number of global challenges, including new and emerging conflicts, turbulence in the markets, supply chain instability, climate change and the COVID-19 pandemic.

What is the importance of SCO for India?



Source – Indian Express

Bharat 6G Alliance

News: Bharat 6G Alliance is a collaborative platform launched by the Department of Telecommunications (DoT) on 4 July 2023 to drive innovation and collaboration in next-generation wireless technology.

Background:

- Additionally, with a grant of 240.51 crores under the **Telecom Technology Development Fund (TTDF)**, two agreements were signed for projects.

What is 6G Technology?

- 6G technology is the sixth generation of wireless communication technology that is currently under development. 6G technology will likely be significantly faster, more reliable, more secure and more intelligent than 5G technology.
- It will also support new applications beyond current mobile use scenarios, such as **ubiquitous instant communications, pervasive intelligence** and the **Internet of Things (IoT)**.
- 6G technology will use higher frequencies than 5G technology, such as **millimetre waves** (30 to 300 GHz) and **terahertz radiation** (300 to 3000 GHz), which can provide higher data rates and lower latency.
- One of the goals of 6G technology is to support **one microsecond-latency communication**, which is 1000 times faster than the latency of 5G technology.

What is Bharat 6G Alliance?

- The B6GA is a collaborative platform comprising public and private companies, academia, research institutions, and standards development organizations.
- The alliance will forge partnerships and synergies with other 6G global alliances to facilitate international collaboration and knowledge exchange.
- Its primary objective is to understand the business and societal needs of 6G technology, foster consensus, and drive high-impact research and development initiatives.
- The alliance also aims to achieve **at least 10% of the 6G intellectual property rights** from India by 2029 or 2030.

What is TTDF?

- Telecom Technology Development Fund (TTDF) Scheme is a scheme launched by the **Universal Service Obligation Fund (USOF)**, a body under the Department of Telecommunications, on 1 October 2022 to fund research and development in rural-specific communication technology applications and to promote indigenous technology and manufacturing in the telecom sector.
- The scheme provides grants to Indian entities involved in technology design, development, commercialization of telecommunication products and solutions, to enable affordable broadband and mobile services in rural and remote areas.

Source – PIB, dot.gov.in, BusinessToday.in

Facts for Prelims

Alluri Sitaram Raju

News: Recently, the President of India attended the closing ceremony of the 125th Birth Anniversary of Alluri Sitarama Raju in Hyderabad.

Who was Alluri Sitaram Raju?

- Alluri Sitaram Raju was an Indian revolutionary who fought against the British colonial rule in India in the early 20th century.
- He was born on 4 July 1897 or 1898 in Pandrangi, Madras Presidency, British India (present-day Andhra Pradesh, India).

Which rebellion was he part of?

- He led the **Rampa Rebellion of 1922-1924**, an armed campaign against the British authorities who imposed oppressive laws on the forest dwellers and exploited them.
- He was known as **Manyam Veerudu** (Hero of the Jungle) by the local people for his bravery and leadership. He was captured and executed by the British on 7 May 1924 at Koyyuru village in Chintapalle forests.
- He was inspired by the **Non-Cooperation Movement** and persuaded people to wear khadi and give up drinking. He also asserted that India could be liberated only by the use of force, not non-violence.
- He used guerrilla tactics to attack police stations, kill British officials and acquire firearms. He also spread Gandhiji's ideas of swaraj and self-reliance among the rebels.
- He sacrificed his life for the cause of freedom and became a symbol of courage and resistance for the people.

Gucchi Mushroom

News: Unpredictable weather patterns, early springs, and above-average temperatures have left gucchi mushroom hunters in distress, facing another season of low yield for the second consecutive year.

What is Gucchi Mushroom?

- Gucchi mushroom is a **species of fungus** that belongs to the Morchellaceae family of the Ascomycota division. It is also known by its scientific name *Morchella esculenta*.
- It has a spongy and honeycombed appearance, with a pale yellow cap and a white stem.
- It is one of the most expensive mushrooms in the world, as it cannot be cultivated commercially and grows wild only in some regions of the Himalayas, such as Jammu and Kashmir, Himachal Pradesh and Uttarakhand.
- It is prized for its unique flavour, earthy aroma and health benefits.



Research in India - Data, Prospects and Challenges

News: The government's approval for a National Research Foundation (NRF) is being widely welcomed by the scientific community.

Background:

- The NRF has the potential to, single-handedly, address a whole range of deficiencies in India's scientific research sector that have been flagged for years now.

Status of Research in India:

Expenditure on R&D

- For more than two decades now, the Centre's stated objective has been to allocate **at least two per cent of the national GDP** on R&D.
- However, the expenditure on research as a proportion of GDP has gone down, **from about 0.8 per cent** at the start of this millennium to about **0.65 per cent** now. For the last decade or so, this share has remained stagnant.
- Globally**, about **1.79 per cent of (world) GDP** is spent on R&D activities.
- Israel 5.35%, USA 3.42%, Korea 4.8% (Expenditure on R&D as % of GDP – UNESCO Science Report 2021)
- India spent only 42 US dollars (in PPP terms) per researcher in 2020, compared with nearly 2,150 by Israel, 2,180 by South Korea and 2,183 by the United States.
- Moreover, **women comprise only 18 per cent** of total scientific researchers in India, while globally this number was 33 per cent.

Research in Universities

- India has nearly 40,000 institutions of higher education, mostly colleges. More than 1,200 of these are full-fledged universities.
- Only one per cent** of these engage in active research, according to the detailed project report on NRF.

Research Output

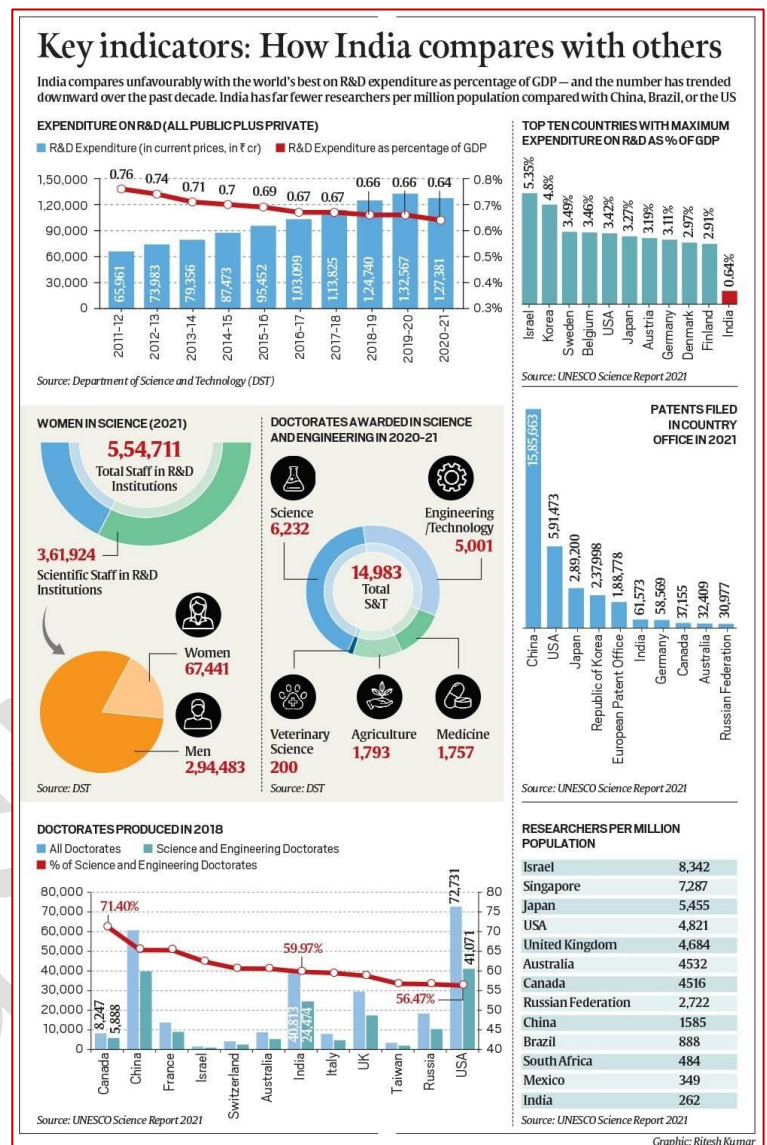
- India produced 25,550 doctorates in 2020-21, of which 14,983 were in science and engineering disciplines. This 59 per cent proportion in the overall doctorates compares well with other countries, putting India in the seventh rank overall.
- But because of India's large population, this is not impressive in proportional terms. In fact, the **number of researchers per million population in India, 262**, is extremely low compared with even developing countries like Brazil (888), South Africa (484) or Mexico (349).

Patents

- In 2021, a total of 61,573 patents were filed in India, making it the sixth largest in the world. But this was nowhere close to the nearly 16 lakh patents filed in China, and about six lakh in the United States that year.

What needs to be done?

- NRF will play a pivotal role in streamlining institutions at different levels, increase access and availability of funding. For example, eminent institutions like IITs and IISc get a bulk of research funding but state universities get very little (about 10% of research funds). The NRF will correct this.



- The NRF's budget will be about Rs 50,000 crore for the period 2023 to 2028. **About 70 per cent of this budget** will be obtained from the **private sector** as research investments; the remaining amount will come from the government. Thus, it is important to ensure that consistent funding is on the line of envisaged goals and important research work shouldn't take the backseat.
- Modalities of seeding, nurturing and promoting research by providing funds to less-endowed institutions and also **monitoring outcomes should be transparent**.
- It is equally important to ensure that **basic research** and **small-scale research proposals are not brushed aside**.
- Funding for Mega projects such as supercomputing and quantum computing mission are not taken from NRF budget.

Way Forward

- NRF is expected encourage young researchers who have gone abroad to return to India and help benefit India's intellectual capital.
- If the **caveats of centralisation of research funding are addressed** before the NRF starts to function, we may soon expect a tsunami of scientific research and development that will propel our country to a technologically advanced state.

Source – Indian Express