

GOVERNANCE

Council of Scientific and Industrial Research

Recently, the Prime Minister chaired a meeting of the Council of Scientific and Industrial Research (CSIR) Society through video conference. Earlier CSIR Floriculture Mission was approved for implementation in 21 States and Union Territories of India.

It is also planning to undertake genome sequencing of a sample of nearly 1000 Indian rural youth to determine unique genetic traits, susceptibility (and resilience) to disease.

Key Points

About:

- It is the largest research and development (R&D) organisation in India. It has a pan-India presence and has a dynamic network of 37 national laboratories, 39 outreach centres, 3 Innovation Complexes and 5 units.
- It is ranked 37th among 1587 government institutions worldwide and is the only Indian organization among the top 100 global government institutions, according to the Scimago Institutions Ranking World Report 2021. CSIR holds the 7th rank in Asia and leads the country at the first position.
- The Prime Minister is the President (Ex-officio) and the Union Minister of Science and Technology is the Vice President (Ex-officio).

Funding: CSIR is funded by the Ministry of Science and Technology and it operates as an autonomous body through the Societies Registration Act, 1860.

Established: September 1942.

Located: New Delhi.

Objectives:

- Scientific and industrial/applied research of national importance. It covers a wide spectrum of streams such as: Radio and space physics, oceanography, biotechnology, nanotechnology, information technology, etc.
- It provides significant technological intervention in many areas with regard to societal efforts which include the environment, health, drinking water, food, housing, energy, farm and non-farm sectors.

Some Initiatives:

- **Covid-19:**
CSIR has set up five technology verticals for addressing the emerging situation due to pandemic:
 1. Digital and Molecular Surveillance.
 2. Rapid and Economical Diagnostics.
 3. Repurposing of Drugs, Vaccine and Convalescent Plasma Therapy.
 4. Hospital Assistive Devices and PPEs (Personal Protective Equipment).
 5. Supply Chain and Logistics Support Systems.
- **Strategic:** Head-Up-Display (HUD): It developed indigenous Head-Up- display (HUD) for Indian Light Combat Aircraft, Tejas. HUD aids the pilot in flying the aircraft and in critical flight maneuvers including weapon aiming.
- **Energy & Environment:** Solar Tree: It occupies minimum space to produce clean power. Lithium Ion Battery: India's first lithium ion battery fabrication facility based on indigenous novel materials for making 4.0 V/14 h standard cells has been established.
- **Agriculture:**
 1. Samba Mahsuri Rice Variety: It developed a Bacterial Blight Resistant Rice.
 2. Rice Cultivar (Muktashree): A rice variety has been developed which restricts assimilation of Arsenic within permissible limits.
 3. White-fly resistant Cotton variety: Developed a transgenic cotton line which is resistant to whiteflies.
- **Healthcare:** Genomics and other omics technologies for Enabling Medical Decision – GOMED: It has been developed by the CSIR which provides a platform of disease genomics to solve clinical problems.
- **Food & Nutrition:**
 1. Ksheer-scanner: It detects the level of milk adulteration and adulterants in 45 seconds at the cost of 10 paise.

2. Double-Fortified Salt: Salt fortified with iodine and iron having improved properties developed and tested for addressing anaemia in people.

SCIENCE & TECHNOLOGY

Corbevax Covid-19 Vaccine

India has placed an advance order to block 300 million doses of a new Covid-19 vaccine, Corbevax.

Key Points

Corbevax:

- **About:** It is India's indigenous Covid-19 vaccine which is currently undergoing Phase 3 clinical trials.
- **Working:**
 1. It is a "recombinant protein sub-unit" vaccine.
 2. It means it is made up of a specific part of SARS-CoV-2 - the spike protein on the virus's surface.
 3. The spike protein allows the virus to enter the cells in the body so that it can replicate and cause disease.
 4. However, when this protein alone is given to the body, it is not expected to be harmful as the rest of the virus is absent.
 5. The body is expected to develop an immune response against the injected spike protein.
 6. Therefore, when the real virus attempts to infect the body, it will already have an immune response ready that will make it unlikely for the person to fall severely ill.

Difference between Corbevax and Other Covid-19 Vaccines:

- They are either mRNA vaccines (Pfizer and Moderna), viral vector vaccines (Covishield and Sputnik V) or inactivated vaccines (Covaxin, Sinovac-CoronaVac and Sinopharm's Vero Cell).
- Viral vector and mRNA vaccines use a code to induce our cells to make the spike proteins against which the body has to build immunity.
 1. In the case of Corbevax, protein itself is given.
 2. mRNA vaccines work by using messenger RNA (mRNA), which is the molecule that essentially puts DNA instructions into action. Inside a cell, mRNA is used as a template to build a protein.
 3. Viral vector vaccines use a modified version of a different virus (the vector) to deliver important instructions to our cells.
- Inactivated vaccines include killed particles of the whole SARS-CoV-2 virus, attempting to target the entire structure of the virus.
- Corbevax, like the mRNA and viral vector Covid-19 vaccines, targets only the spike protein, but in a different way.

Other Types of Vaccine

Live-attenuated Vaccines:

- Live vaccines use a weakened (or attenuated) form of the germ that causes a disease.
- Because these vaccines are so similar to the natural infection that they help prevent, they create a strong and long-lasting immune response.
- The limitation of this approach is that these vaccines usually cannot be given to people with weakened immune systems.
- Live vaccines are used against: Measles, mumps, rubella (MMR combined vaccine), Rotavirus, Smallpox among others.

Subunit, recombinant, polysaccharide, and conjugate Vaccines:

- They use specific pieces of the germ - like its protein, sugar, or capsid (a casing around the germ). They give a very strong immune response.
- They can also be used on people with weakened immune systems and long-term health problems.
- These vaccines are used to protect against: Hib (Haemophilus influenzae type b) disease, Hepatitis B, HPV (Human papillomavirus), Pneumococcal disease among others.

Toxoid Vaccines:

- Toxoid vaccines use a toxin made by the germ that causes a disease. Toxoid vaccines are used to protect against: Diphtheria, Tetanus.

2.CIBER-2: Counting of Stars

A NASA (National Aeronautics and Space Administration) funded CIBER-2 sounding rocket's launch window will open at the White Sands Missile Range in New Mexico, USA. The aim of CIBER-2 mission

is to look for evidence of extra stars that may have been missed in stellar head counts. The ESA (European Space Agency) infrared space observatory Herschel also counted the number of galaxies in infrared and measured their luminosity previously.

Key Points**Sounding Rocket:**

- Sounding rockets take their name from the nautical term "to sound," which means to take measurements.
- Since 1959, NASA-sponsored space and earth science research has used sounding rockets to test instruments used on satellites and spacecraft and to provide information about the Sun, stars, galaxies and Earth's atmosphere and radiation.

About CIBER-2 (Cosmic Infrared Background Experiment-2):

- The mission is the latest in a series of sounding rocket launches that began in 2009. The count from the first CIBER mission paved the way to reorganize the research and give the counting of stars another run.
- The CIBER-2 instrument will launch aboard a sounding rocket, a small suborbital rocket that will carry scientific instruments on brief trips into space before it falls back to Earth for recovery.
- Once above Earth's atmosphere, CIBER-2 will survey a patch of sky about 4 square degrees - for reference, the full Moon takes up about half a degree - that includes dozens of galaxy clusters.
- It will not actually count individual stars but it will instead detect the extragalactic background light, which is all of the light that has been emitted throughout the history of the Universe.
- From all of this extragalactic background light, the CIBER-2 will focus on a portion of this called cosmic infrared background, which is emitted by some of the most common stars. Essentially, this approach is aiming to look at how bright this light is to give scientists an estimate of how many of these stars are out there.

Rough Estimate of Stars:

- To get a rough estimate of the total number of stars in the universe, scientists have calculated the average number of stars in a galaxy - some estimates put it at about 100 million, though it could be 10 or more times higher.
- Multiplying it by the number of galaxies, taken to be about 2 trillion (also very tentative), there are one hundred quintillion stars (or 1 with 21 zeros after it).
- But this calculation assumes that all stars are inside galaxies, which might not be true and this is what the CIBER-2 instrument will try to find out.
- The European Space Agency (ESA) says there could be 100 thousand million stars in the Milky Way alone.

BIODIVERSITY AND ENVIRONMENT**World Environment Day 2021**

The World Environment Day is observed on the 5th of June annually to encourage awareness and environmental protection.

Key Points**World Environment Day:**

- **History:** The United Nations Assembly established World Environment Day in 1972, which was the first day of the Stockholm Conference on the human environment.
- **Theme for 2021:** 'Ecosystem Restoration'. It will kick off the UN Decade on Ecosystem Restoration (2021-2030) - a global mission to revive billions of hectares, from forests to farmlands, from the top of mountains to the depth of the sea. The theme for this year's in India is 'promotion of biofuels for a better environment'.
- **Host Nation:** Pakistan will be the global host for 2021.
- **Initiatives Taken by India:** E-100 pilot project has been launched in Pune for the production and distribution of ethanol across the country. The government is releasing the E-20 notification that will allow oil companies to sell 20% ethanol blended petrol from 1st April, 2023, and BIS specifications for ethanol blends E12 and E15.

Ecosystem Restoration

- **Ecosystem:**

- It is a community of plants and animals interacting with each other in a given area, and also with their non-living environments. The non-living environments include weather, earth, sun, soil, climate and atmosphere.
- The ecosystem relates to the way that all these different organisms live in close proximity to each other and how they interact with each other.
- **Ecosystem Restoration:**
- Ecosystem restoration means assisting in the recovery of ecosystems that have been degraded or destroyed, as well as conserving the ecosystems that are still intact. It involves reviving old water bodies, building natural forests, providing space to wildlife and reducing water pollution to restore aquatic life.
- Healthier ecosystems, with richer biodiversity, yield greater benefits such as more fertile soil, bigger yields of timber and fish, and larger stores of greenhouse gases.
- **Need of Restoration:**
- Ecosystem loss is depriving the world of carbon sinks, like forests and wetlands, at a time when humanity can least afford it.
- Global greenhouse gas emissions have grown for three consecutive years and the planet is one place for potentially catastrophic climate change.
- **India's Restoration Initiatives:**
- National Afforestation Programme (NAP): It focuses on the rehabilitation of degraded forests and afforestation around forests.
- National Mission for a Green India (GIM): It is under the National Action Plan on Climate Change (NAPCC) and aimed at improving and increasing tree cover as a climate adaptation and mitigation strategy.
- National Biodiversity Action Plan: It has been launched to implement strategies for the reduction in rates of degradation, fragmentation and loss of natural habitats.
- Rural Livelihood Schemes: Recognition of natural resources intrinsically linked to rural livelihoods is also reflected in flagship schemes like the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) and the National Rural Livelihood Mission (NRLM). Potential for restoration through MGNREGA lies in its plantation and rejuvenation of water bodies subcomponents, through which provisions for livelihoods in afforestation, tree plantation, horticulture, and construction of new ponds have been made. Similarly, schemes under NRLM, bifurcated into farm and non-farm livelihoods, focus on interventions to enhance natural capital and present opportunities for ecosystem restoration.

IMPORTANT FACTS FOR PRELIM

37th Anniversary of Operation Blue Star

Recently, the 37th anniversary of Operation Blue Star was observed by the country.

Key Points

Operation Blue Star:

- It is a code name given to an Indian Military Operation to remove the separatists who were hidden inside the Golden Temple at Amritsar on 5th June 1984.
- The operation was ordered by the then Prime Minister Indira Gandhi, primarily to take control of the Harmandir Sahib Complex in Amritsar (popularly known as the Golden Temple).
- The Indian military entered into the premises of the temple to drive out the Sikh extremist religious leader, Jarnail Singh Bhindranwale and his armed followers.
- The operation had two components to it, Operation Metal which was the invasion on the temple complex and Operation Shop which was confined to the countryside of the state.
- This Operation helped in eliminating Khalistani terrorism.
 1. It resulted in the death of Bhindranwale.
 2. Few months post-Operation Blue Star, Indira Gandhi was assassinated by her Sikh bodyguards, followed by severe anti-Sikh riots in Delhi.

Background:

- Jarnail Singh Bhindranwale wanted the Indian government to pass the Anandpur Resolution, and thereby agree to the formation of a separate state of Khalistan for Sikhs.
- Since 1982, this radical leader of Sikhism had managed to gain enough support for his cause and by mid-1983 had set up a base inside the Golden Temple complex, with ammunition and his followers.

- Hence, Operation Blue Star was launched between 1st June and 6th June 1984, with the aim of getting rid of Bhindranwale and his demands.

National Security Guard

- It is a counter-terrorism unit that formally came into existence in 1986 by an act of Parliament- 'National Security Guard Act, 1986'. Its headquarters is located in Manesar, Gurugram.
- The idea behind raising such force came in the aftermath of Operation Blue Star, Akshardham Temple attack and the assassination of former PM Indira Gandhi, for combating terrorist activities with a view to protect states against internal disturbances.

DAILY ANSWER WRITING PRACTICE

Qns. Discuss the basic principles of the communitarianism school of thought.

Ans:

Introduction

Communitarianism is a social and political philosophy that emphasizes the importance of community in the functioning of political life, in the analysis and evaluation of political institutions, and in understanding human identity and well-being.

Body

- According to communitarians, a healthy community, and not the maximization of individual choices, is the desirable goal of public decision-making.
- They regard any individual as inherently situated in society. It is within society that individuals have their being and acquire their identity. Society and other human beings are a prerequisite for human life and happiness. In a way, communitarians accord higher priority to society over the individual.
- Communitarians value courteous dialogues on public issues, reasoned analysis of problems, and dispassionate individual decision-making.
- According to them, laws will be effective only when they are based on a moral consensus that aims at specific goals.
- The goals which governments need to pursue are healthy citizenry, environmental protection, reducing crimes, and strengthening community solidarity.
- They do not, however, advocate any form of collectivist or dictatorial ideology. What they have in mind is a global community—with all its diversities—of the information age.

Conclusion

- This view is in sharp contrast with the economic theory of the market in which individual self-interest acts as the driving force with the myriad individual decisions getting coordinated by an invisible hand.
- In contrast, communitarians argue that consideration for others, altruism, loyalty, community-based attachments, and other group-based sentiments are at the base of social life.

DAILY QUIZ

Q1. The Constitution states that “before a Minister enters upon his office, the Governor shall administer to him the oaths of office and of secrecy” according to the forms set out for the purpose in the:

- a. Second Schedule.
- b. Third Schedule.**
- c. Fourth Schedule.
- d. Seventh Schedule.

Q2. Consider the following statements about PM-CARES Fund:

1. It was set up as a public charitable trust.
2. It can avail donations from the foreign contribution.
3. Prime Minister is the ex-officio Chairman of the PM CARES Fund.

Which of the given above statements is/are correct?

- a. 1 and 2 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3**

Q3. China's un-crewed 'Tianwen-1' spacecraft recently landed safely on the surface of:

- a. Moon
- b. Mars**

- c. Sun
- d. Venus

Q4. The Pressure swing adsorption (PSA) technology was in news recently, it can be used in:

- 1. the separation of carbon dioxide from biogas
- 2. hypoxic air fire prevention systems
- 3. the space suit Primary Life Support Systems
- 4. the removal of hydrogen sulfide from hydrogen feed

Select the correct answer using the code below:

- a. 1 and 4 only
- b. 1, 2 and 3 only
- c. 2, 3 and 4 only
- d. 1, 2, 3 and 4**

Q5. With reference to Indian Elephants, consider the following statements :

- 1. The leader of an elephant group is a female.
- 2. The maximum gestation period can be 22 months.
- 3. An elephant can normally go on calving till the age of 40 years only.
- 4. Among the States in India, the highest population is in Kerala.

Which of the statements given above is/are correct?

- a. 1 and 2 only**
- b. 3 and 4 only
- c. 1 only
- d. 1, 2 and 4 only.



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