



Council of Scientific & Industrial Research (CSIR)

For Prelims: Council of Scientific and Industrial Research (CSIR), National Aerospace Laboratories (NAL)

For Mains: Significance of Council of Scientific and Industrial Research (CSIR).

Why in News?

Recently, [Council of Scientific and Industrial Research \(CSIR\)](#) celebrated its **81st Foundation Day**.

What is CSIR?

- **About:** CSIR is the largest **research and development (R&D)** organisation in India. **CSIR has a pan-India presence** and has a dynamic network of 37 national laboratories, 39 outreach centres, 3 Innovation Complexes and 5 units.
- **Established:** September 1942
- **Headquarters:** New Delhi
- **CSIR** is funded by the **Ministry of Science and Technology** and it operates as an **autonomous body** through the **Societies Registration Act, 1860**.
- CSIR covers a wide spectrum of streams – from radio and space physics, oceanography, geophysics, chemicals, drugs, genomics, biotechnology and nanotechnology to mining, aeronautics, instrumentation, environmental engineering and information technology.
 - It provides significant **technological intervention** in many areas with regard to **societal efforts** which include the **environment, health, drinking water, food, housing, energy, and farm and non-farm sectors**.
- **Organisational Structure:**
 - **President:** Prime Minister of India (Ex-officio)
 - **Vice President:** Union Minister of Science and Technology (Ex-officio)
 - **Governing Body:** The Director-General is the head of the governing body.
 - The other ex-officio member is the finance secretary (expenditures).
 - Other members' terms are of **three years**.
 - **CSIR Advisory Board:** 15-member body composed of prominent members from respective fields of science and technology. Its function is to provide science and technology input to the governing body.
 - Member **terms are of three years**.
- **Objectives:** The objectives of the Council are **scientific and industrial/applied research of national importance. The activities include:**
 - **Promotion, guidance and coordination of scientific and industrial research** in India including the institution and the financing of specific researchers.
 - Establishment and award of **research studentships and fellowships**.
 - **Utilization of the results of the research conducted** under the auspices of the Council towards the development of industries in the country.
 - **Establishment, maintenance and management of laboratories, workshops, institutes and organisations** to further scientific and industrial research.
 - **Collection and dissemination of information** in regard not only to research but to

- industrial matters generally.
- **Publication of scientific papers and a journal** of industrial research and development.

What are the Key Achievements?

▪ **Strategic Sector:**

- **Drishti transmissometer:** It is an Indigenous - Innovative -Cost-effective visibility measuring system that provides information to pilots on visibility for safe landing & take-off operations and is suitable for all airport categories.
- **Head-Up-Display (HUD): CSIR-National Aerospace Laboratories (NAL)** developed an indigenous Head-Up- display (HUD) for Indian [Light Combat Aircraft, Tejas](#).
 - HUD aids the pilot in flying the aircraft and in critical flight manoeuvres including weapon aiming.
- **Indigenous Gyrotron:** Design and development of indigenous gyrotron for nuclear fusion reactors have been accomplished.
 - A gyrotron is a **vacuum electronic device (VED)** capable of generating high-power, high-frequency THz radiation.

▪ **Energy & Environment:**

- **Solar Tree:** It was designed by **CSIR- The Central Mechanical Engineering Research Institute (CMERI)** lab in Durgapur. It occupies the minimum space to produce clean power.
- **Lithium-Ion Battery:** The **Central Electrochemical Research Institute (CECRI), Karaikudi in Tamil Nadu**, has set up the first indigenous Li-ion fabrication facility that has applications in defence, solar-powered devices, railways and other high-end usages.

▪ **Agriculture:**

- **Samba Mahsuri Rice Variety:** CSIR in collaboration with ICAR developed an improved **bacterial blight-resistant** Samba Mahsuri variety.
- **Rice Cultivar (Muktashree) for Arsenic Contaminated Areas:** A rice variety has been developed which restricts assimilation of Arsenic within the permissible limit.
- **White-fly Resistant Cotton Variety:** Developed a transgenic cotton line which is resistant to whiteflies.

▪ **Healthcare:**

- **JD Vaccine for Farm Animals:** Vaccine developed and commercialized for Johne's disease (JD) affecting Sheep, goats, cows and Buffalo so as to immunize them and increase milk & meat production.
- **Plasma Gelsolin Diagnostic Kit for Premature Births, and Sepsis-related Deaths** to diagnose premature birth and sepsis.
- **GOMED:** A programme called **GOMED (Genomics and other omics technologies for Enabling Medical Decision)** has been developed by the CSIR which provides a platform for disease genomics to solve clinical problems.

▪ **Food & Nutrition:**

- **Ksheer-scanner:** It is a new technological invention by **CSIR-Central Electronics Engineering Research Institute (CEERI)** to detect the level of milk adulteration and adulterants in 45 seconds at the cost of 10 paise.
- **Double-Fortified Salt:** Salt fortified with iodine and iron has improved properties developed and tested for addressing anaemia in people.
- **Anti-obesity DAG Oil:** Oil enriched with **Diacylglycerol (DAG)** instead of conventional triacylglycerol (TAG) developed.

▪ **Water:**

- **Aquifer Mapping of Water Scarce Areas: Heliborne transient electromagnetic and surface magnetic technique-based** aquifer mapping was carried out in six different geological locations in Rajasthan (2), Bihar, Karnataka, Maharashtra and Tamil Nadu.
- **Understanding the Special Properties of Ganga Water:** An assessment of water quality & sediment analysis of Ganga from different parts being done.

▪ **Waste to Wealth:**

- Non-toxic radiation shielding materials utilizing industrial waste like red mud (from aluminium industries) and fly ash (Thermal Power Plants) developed which have been accredited by **Atomic Energy Regulatory Board (AERB)** for application in diagnostic X-Ray rooms.

- **Waste Plastic to Fuel:** Process for conversion of waste plastics to gasoline/diesel or aromatics developed.
- **The Indelible Mark:**
 - The Indelible ink used to **mark the fingernail of a voter during elections** is a time-tested gift of CSIR to the spirit of democracy.
 - Developed in 1952, it was first produced in-campus.
- **Aviation:**
 - The CSIR-National Aerospace Laboratories has **designed a plane 'SARAS'**.
 - In 2011, successfully tested India's 1st indigenous civilian aircraft, NAL NM5 made in association with National Aerospace Laboratories and Mahindra Aerospace.
- **Traditional Knowledge Digital Library:**
 - CSIR has established the first-ever 'Traditional Knowledge Digital Library' **in the world**. It is accessible in five international languages (English, German, French, Japanese and Spanish).
 - CSIR successfully challenged the grant of patent in the USA for use of Haldi (turmeric) for wound healing and neem as an insecticide on the basis of traditional knowledge.
- **Genome sequencing:** CSIR completed the sequencing of the Human Genome in 2009.
- **Computing:** Flosolver, India's first parallel computer was built in 1986. Flosolver's success triggered other successful parallel computing projects in the country such as [PARAM](#).

UPSC Civil Services Examination Previous Year Question (PYQ)

Q. For outstanding contribution to which one of the following fields is Shanti Swarup Bhatnagar Prize given? (2009)

- (a) Literature
- (b) Performing Arts
- (c) Science
- (d) Social Service

Ans: (c)

Exp:

- **The Shanti Swarup Bhatnagar Prize is named after the founder Director of the Council of Scientific and Industrial Research (CSIR),** late Dr. (Sir) Shanti Swarup Bhatnagar and is known as the 'Shanti Swarup Bhatnagar Prize for Science and Technology'.
- Prizes, each of the value of `5,00,000 (Rupees five lakh only), is awarded annually for notable and outstanding research, applied or fundamental, in the following disciplines:
 - Biological Sciences,
 - Chemical Sciences,
 - Earth, Atmosphere, Ocean and Planetary Sciences,
 - Engineering Sciences,
 - Mathematical Sciences,
 - Medical Sciences and
 - Physical Sciences.
- Any citizen of India engaged in research in any field of science and technology up to the age of 45 years as reckoned on 31st December of the year preceding the year of the prize and Overseas Citizen of India (OCI) and Persons of Indian Origin (PIO) working in India are also eligible for the prize. **Therefore, option (c) is the correct answer.**

Source: PIB

