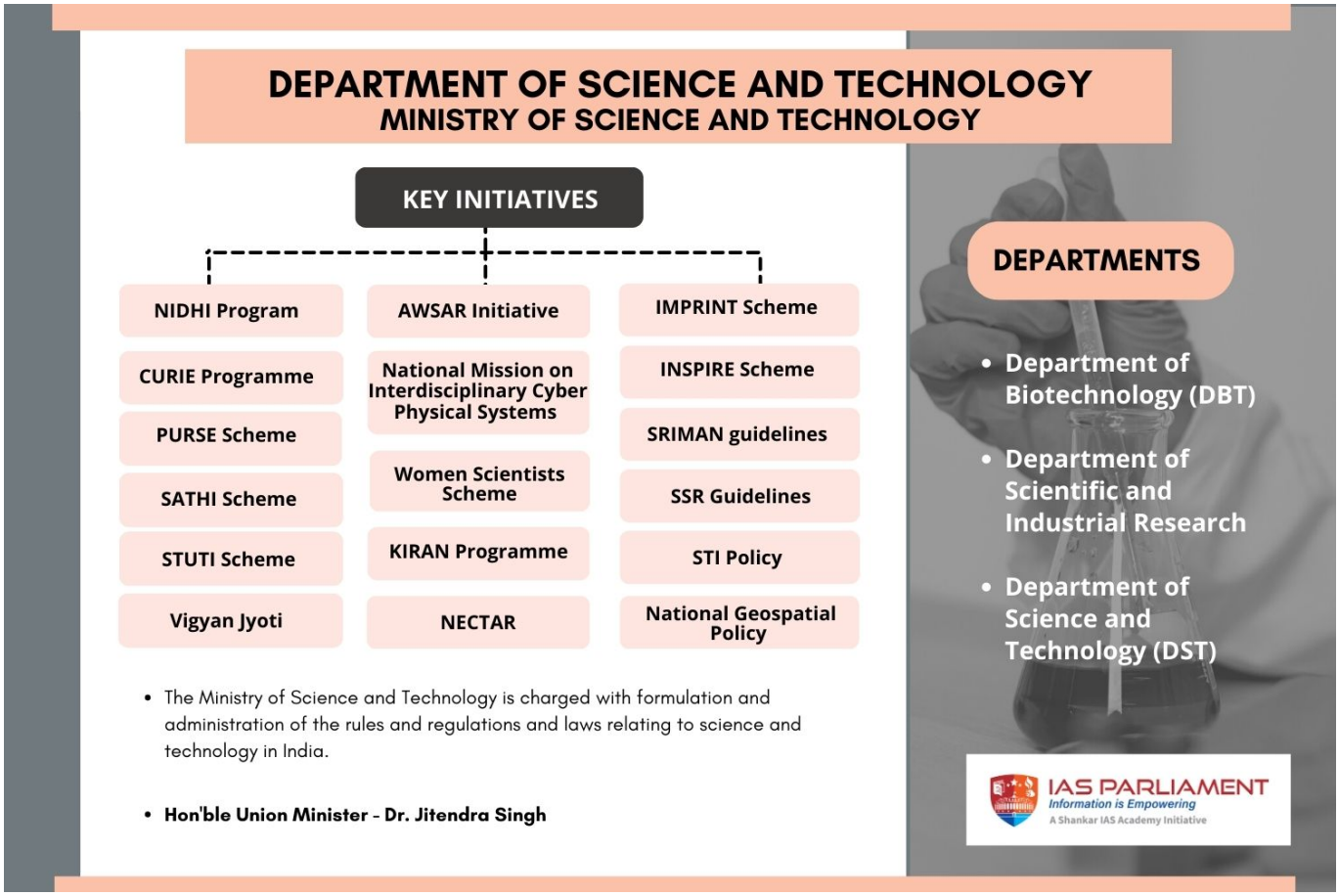
Year-End Review -2022: Ministry of Science & Technology Part-1

Ministry of Science & Technology

- The Ministry of Science and Technology is charged with formulation and administration of the rules and regulations and laws relating to science and technology in India.



MAJOR ACHIEVEMENTS OF DEPARTMENT OF SCIENCE AND TECHNOLOGY (DST) – 2022

1. Start-Up and Innovation Ecosystem

- **NIDHI Program -** NIDHI (National Initiative for Development and Harnessing Innovations) aims to nurture ideas and innovations into successful startups.
- **NIDHI-Entrepreneur in Residence (NIDHI-EIR) -** Encouraging graduates to take to entrepreneurship
- **Startup-NIDHI** - Encouraging students to promote start-ups
- **NIDHI-Technology Business Incubator(TBI) -** Converting innovations to start-ups

- **NIDHI-Accelerator** - Fast tracking a start-up through focused intervention
- **NIDHI-Seed Support System (NIDHI-SSS)** - Providing early stage investment
- **NIDHI Centres of Excellence (NIDHI-CoE)** - A world class facility to help startups go global

2. Technology Development in Cyber physical Domains

- **National Mission on Interdisciplinary Cyber Physical Systems -** The Union Cabinet approved the National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) in 2018 for a period of 5 years.
- Cyber-Physical System (CPS) combines digital/ cyber elements with physical objects and data with capabilities of communication, data collection & processing, computing, decision making and action.
- The NM-ICPS is a comprehensive mission aimed at complete convergence with all stakeholders by establishing strong linkages between academia, industry, government and international organizations.
- **XraySetu** - An AI-driven platform called XraySetu was developed for Chest X-ray interpretation of images.
- **RAKSHAK** - A tapestry method for screening COVID-19 was developed under Remedial Action, Knowledge Skimming, and Holistic Analysis of COVID-19 (RAKSHAK).

3. International S&T Engagement

- The DST takes the responsibility of coordinating the activities of Science-20 (S20) and Research Innovation Initiative Gathering (RIIG) Engagement Groups during India's G20 Presidency in 2023.

4. Geospatial Data

- The **2nd United Nations World Geospatial Information Congress (UNWGIC)** on the theme "Geo-Enabling the Global Village: No one should be left behind" was held in Hyderabad.
- India was awarded to chair the new working group constituted for the **Integrated Geospatial Information Framework (IGIF).**
- Survey of India (SoI) has successfully carried out drone survey of rural abadi areas of 2,00,000+ villages as part of the SVAMITVA scheme.

Survey of Villages and Mapping with Improvised Technology in Village Areas' (SVAMITVA) Scheme

- It is a Central Sector Scheme of the Ministry of Panchayati Raj, which was launched on National Panchayati Raj Day, 24th April 2020.
- The scheme aims to provide the 'record of rights' to village household owners in rural areas and issue Property Cards.
- The Scheme is being implemented across the country in a phased manner over a period of four years (2020-2024).

5. Technology Commercialization

- A drone show with 1000 indigenized drones by women led company positioned India at 4th place on the globe.
- Gurugram based tech startup company has showed potential to reduce cost of purified water to as low as 25 paise per litre.
- A women led startup from Bengaluru has proposed an innovative wireless product to solve Internet connectivity issues of the rural India.

6. Scientific Infrastructure

- **PURSE scheme** - Under 'Promotion of University Research and Scientific Excellence (PURSE)' and 'Fund for Improvement of S&T Infrastructure (FIST)', many universities were provided substantive research grant to strengthen the research infrastructure.
- **SATHI** - Sophisticated Analytical & Technical Help Institute (SATHI) refers to a shared, professionally managed, S&T infrastructure facility, which can be readily be accessible to academia, start-ups, manufacturing units, industries and R&D Labs.
- **STUTI Scheme** - The 'Synergistic Training program Utilizing the Scientific and Technological Infrastructure' (STUTI) is intended to build human resource and its knowledge capacity through open access S&T Infrastructure across the country.

7. Tech-Led Solutions for Energy and Environment Challenges

- **Air Unique Quality Monitoring System (AUM)** has been developed which is capable of real time remote monitoring of all air quality parameters, with high sensitivity and accuracy simultaneously.
- A **coal to methanol plant** has been installed at BHEL-Hyderabad to demonstrate the generation of methanol from high ash coal.
- Methanol with purity of more than 99% has been generated from syngas.

8. Career Opportunities for Women Scientists

- **Vigyan Jyoti** - DST is encouraging meritorious girls to pursue higher education and career in underrepresented STEM (Science Technology Engineering Mathematics) fields.
- **Women Scientists Scheme-A (WOS-A) –** It aims to provide opportunities to women scientists and technologists between the age group of 27-60 years who desire to return to mainstream science and work as bench-level scientists.
- **CURIE Programme** - Under Consolidation of University Research through Innovation and Excellence in Women Universities (CURIE), only women Universities are supported for development of research infrastructure and creation of state-of-the-art research laboratories to enhance women's participation in S&T domain.
- **SERB-POWER** - It provides structured support in research to ensure equal access and weighted opportunities for Indian women scientists engaged in R&D activities.
- The R&D support to women scientists is provided through two components
    - SERB POWER Fellowships
    - SERB POWER Research Grants

9. Attracting the Talents to pursue their Career in Science

- **INSPIRE Scheme -** Innovation in Science Pursuit for Inspired Research (INSPIRE) aims to attract talent to study science at an early age and to help the country build the required critical resource pool.
- **Components of the scheme**

1. **Scheme for Early Attraction of Talent (SEATS) –** It aims to attract talented youth to study science by providing INSPIRE Award in the age group 10-15 years and also by arranging summer camps for about 50,000 science students of Class XI with global leaders.
2. **Scholarship for Higher Education (SHE)** - It aims to enhance rates of attachment of talented youth to undertake higher education in science intensive programmes, by providing scholarships and mentorship.
3. **Assured Opportunity for Research Careers (AORC)** – It aims to attract, attach, retain and nourish talented young scientific Human Resource for strengthening the R&D foundation and base.

    - It has two sub-components
        - INSPIRE Fellowship
        - INSPIRE Faculty Scheme

10. Conserving the Heritages through Digital Technologies

- **SHRI programme** – Under Science and Heritage Research Initiative (SHRI) programme, the sound proofing quality of Pattamadai mat, has been explored for use in noise guarding classrooms and recording studios.

11. Augmenting Research Capabilities

- **SERB-SURE** - State University Research Excellence (SERB-SURE) aims to create a robust R&D ecosystem in state universities and colleges including the private ones.

12. Policy Formulations

- **Scientific Research Infrastructure Sharing maintenance and Networks (SRIMAN) guidelines** – It aims to promote efficient utilisation and wider access of research infrastructure to scientists, researchers and industry professionals.
- **Scientific Social Responsibility (SSR) Guidelines** - SSR is based on the moral and ethical obligation of the scientific community to give back the benefits they derive from science to the society.
- **Science, Technology and Innovation (STI) Policy** - The new policy revolves around the core principles of being decentralized, evidence-informed, bottom-up, experts-driven, and inclusive.
- **National Geospatial Policy –** It is a citizen-centric policy that liberalizes the geospatial sector and democratizes the datasets generated by use of public funds.

MAJOR ACHIEVEMENTS DURING THE LAST 9 YEARS

POLICY LEVEL IMPACTS

- India is now placed at **40th** position among the top innovative economies globally as per **Global Innovation Index (GII) 2022**.
- The country remains among the **top 3** countries in
    - scientific publication as per NSF database
    - in terms of no of PhDs
    - in size of Higher Education System
    - in terms of number of Start-ups
    - in terms of most attractive investment destinations for technology transactions
- India is ranked **9th** in terms of resident patent filing.
- The Gross Expenditure on R&D has increased more than three times in the last 10 years.
- Women's participation in extramural R&D has also doubled in the last 9 years.

Global Innovation Index (GII) 2022

- The Global Innovation Index (GII) was published by World Intellectual Property Organization (WIPO), in partnership with the Portulans Institute.
- It ranks the countries based on their innovation capabilities, including roughly 80 indicators, grouped into innovation inputs and innovation outputs.
- Switzerland is the most innovative economy in the world in 2022 - for the 12th year in a row - followed by the US, Sweden, the UK and the Netherlands.
- India is the innovation leader in the lower middle-income group. It continues to lead the world in ICT services exports.

To know about Part-2, click here

References

1. PIB | Year-End Review -2022: DST
2. PIB | Achievements in the past 9 years