Empowering States Through Science

For Prelims: National Institution for Transforming India, Department of Science and Technology, Intellectual property, National Mission on Medicinal and Aromatic Plants

For Mains: Role of State S&T Councils in India's innovation ecosystem, Importance of decentralisation in research and innovation, Challenges and reforms in India’s grassroots innovation system

Source: PIB

Why in News?

National Institution for Transforming India (NITI Aayog), in its report ***“ A Roadmap for Strengthening State Science and Technology (S&T) Councils”***, has called for reforms in the funding and governance of State S&T Councils.

What is the Role of State S&T Councils in India?

- **About:** Science, Technology, and Innovation (STI) are vital to national development, with both Central and State S&T Departments playing key roles.
  - The Centre-State S&T partnership began in 1971, led by Bharat Ratna **Shri C. Subramaniam,** through the creation of **State Science & Technology Councils (SSTCs)**.
  - Initially set up in Karnataka, Kerala, Uttar Pradesh, and West Bengal, SSTCs now exist in almost all States and UTs across India.
- **Support:** SSTCs are supported by the Department of Science and Technology (DST), Ministry of Science and Technology under the **State Science and Technology Programme (SSTP).**
  - DST provides budgetary assistance to S&T Secretariats of States and UTs. S&T Councils also receive state government funding, though the levels vary significantly.
- **Key Roles:** Councils act as enablers of **grassroots innovations,** often in fields such as agriculture, renewable energy, disaster management, and biotechnology.
  - Promote science-based solutions for resource management, environmental improvement, and better quality of life.
  - S&T Councils develop scientific attitude and awareness among all sections of society.

What are the Key Challenges Faced by State S&T Councils?

- **Overdependence on Core Grants:** Many councils rely heavily on **core grants** from the DST, with minimal effort to secure **project-based grants** from other ministries or agencies.
- **Low Central Financial Support:** Despite being intended as key players in decentralised science governance, most councils receive **very little funding from the Centre**.
  - For instance, of the Rs 300 crore annual budget in Gujarat’s State Science and Technology Council, only Rs 1.07 crore came from the Centre. In the case of **Kerala’s** Rs 150 crore,

the **Centre's (DST) contribution was zero.**
    - State contributions to national **R&D are minimal at just 6.7%, compared to the Centre's 44%.** Smaller states like Sikkim and Mizoram are especially impacted by limited budgets, hindering their scientific progress.
- **Lack of Industry and Institutional Linkages:** Minimal collaboration with **state industries, Public Sector Enterprises (PSEs), and academic institutions (IITs, IIMs)** limits the councils' impact on applied research and innovation.
- **Inefficient Use of Resources:** Disparities in fund utilisation across states point to **regional imbalances** and **inefficiencies in execution**.
- **Lagging Research Output:** The bulk of India's S&T output comes from **Centrally funded institutions**, with **State Councils failing to match productivity** or impact.
- **Budget Cuts in Some States:** A comparative analysis of State S&T Council budgets from 2023–24 to 2024–25 shows a **17.65% overall funding increase,** indicating growing state-level investment.
    - However, states like **Sikkim (-16.16%), Tamil Nadu (-4%), and Uttarakhand (-5%)** have seen reductions in their S&T budgets, affecting ongoing and future projects.
- **Lack of Adaptability:** Councils are struggling to keep pace with the **rapidly evolving R&D landscape**, making their programs and models outdated.
- **Weak Leadership:** Many councils are led by bureaucrats rather than experts in science and technology. This lack of scientific leadership has significantly undermined the councils' ability to drive innovation and research.
- **Staffing Issues:** The councils suffer from a shortage of skilled personnel, and many positions remain vacant due to budgetary constraints. Additionally, many councils lack full-time scientific leaders, leading to inefficiency and poor staff morale.

Success Stories of State S&T Councils

- **Kerala**: Kerala's State Science & Technology Council has successfully implemented **fellowship programs that helped women scientists return to research after career breaks.**
    - The state also allocates over Rs **170 crore annually for science and technology** initiatives, showcasing a robust commitment to R&D.
- **Tamil Nadu**: It has emerged as a **national leader in intellectual property filings,** driven by the efforts of its **Patent Information Centre (PIC).**
    - The state ranked **1st in patent filings and GI registrations and 3rd in industrial design filings** (as per the Indian Patent Office Annual Report 2022–23).
    - For its significant contribution to IP awareness and technology commercialization, Tamil Nadu's PIC received the **National Intellectual Property Award 2023 (Special Citation)** from the Ministry of Commerce and Industry.
- **Punjab**: Punjab's innovative approach to **paddy straw management** has reduced pollution and boosted the local economy by promoting sustainable agricultural practices.
    - This initiative has also created employment opportunities and contributed to environmental conservation.
- **Mizoram:** The **Innovation Facility Centre (IFC)** in Mizoram supports grassroots innovation through technical aid, institutional support, and IP filing.
    - It has developed 82 innovation-related and 93 non-innovative products. The IFC collaborates with institutions like National Innovation Foundation (NIF), NIT Mizoram to promote inclusive growth.
- **Manipur**: Manipur's **aromatic plant cultivation project,** aligned with the **National Mission on Medicinal and Aromatic Plants,** is positioning the state as a potential hub for natural aroma-based products.
    - The initiative has created jobs for local farmers, boosted rural entrepreneurship, and contributed to regional economic growth, showcasing how localized scientific efforts can drive socio-economic development.

What are the Key Reforms Suggested by NITI Aayog to Strengthen

SSTCs?

- **Scientific Leadership**: NITI Aayog recommends appointing full-time scientists, **rather than bureaucrats, to head the councils.** This will ensure that councils are driven by experts who can push for scientific excellence and innovation.
- **Performance-Based Funding**: Instead of flat, non-performance-based grants, NITI Aayog advocates for **funding that is linked to the performance of councils.** This would incentivize states to improve their R&D outcomes and maximize the impact of every rupee spent.
    - States should allocate at least **0.5% of Gross State Domestic Product (GSDP) to S&T for regular and advanced activities.**
    - DST should replace **core grants with performance-based project funding,** except for small NE and UT councils. Councils should explore central ministry schemes beyond DST for additional funding.
- **Secure Jobs and Career Growth**: To improve the morale of scientific staff and retain talent, the roadmap suggests offering secure, long-term jobs with clear career progression for researchers working with SSTCs.
- **Strengthening Industry and Academic Linkages**: Building stronger connections between councils, industries, and academic institutions is critical.
    - This would help bridge the gap between research and commercialization, leading to innovations that benefit both society and the economy.
- **Science Cities and Innovation Hubs**: The roadmap calls for the establishment of **Science Cities planetariums, and innovation hubs in every state.**
    - **Example: Gujarat Science City in Ahmedabad** is a leading hub for scientific learning with state-of-the-art facilities like the Robotics Gallery, showcasing real-world applications in healthcare, industry, and daily life.
    - These would serve as centers of excellence, bringing together research, education, and industry to foster local scientific and technological advancements.
- **STI Information Cell:** Councils should establish Science, Technology & Innovation (STI) Cells to manage state-level STI data and act as nodal points for sharing indicators with government agencies. These cells will support evidence-based policymaking.
- **SSR and CSR Cells**: Councils should lead **Scientific Social Responsibility (SSR) and Corporate Social Responsibility (CSR)** efforts by coordinating resources from institutions and stakeholders to address local challenges and promote scientific awareness.
- **National Monitoring System**: To ensure the effectiveness of these reforms, NITI Aayog proposes the creation of a national monitoring system that tracks the progress of State S&T Councils and holds them accountable for their performance.

NITI Aayog

(National Institution for Transforming India)

HISTORY- PLANNING COMMISSION

Set up in 1950 to direct investment activity

Replaced by **NITI Aayog** on January 1, 2015

Composition of #NITIaayog

- ***Chairperson***
  Prime Minister
- ***Governing Council***
  CMs (States) and Lt Governors (UTs)
- ***Regional Councils***
  Formed on need-basis, comprising CMs and Lt Govs of the region
- ***Members***
  Full-time basis
- ***Part-time Members***
  Max 2, rotational, from relevant institutions
- ***Ex-officio Members***
  Max 4 from Council of Ministers, nominated by PM
- ***Special Inviters***
  Experts, specialists, practitioners with domain knowledge
- ***Chief Executive Officer***
  Appointed by PM for fixed tenure (Secy rank)
- ***Secretariat***
  As deemed necessary

OBJECTIVES

- Foster **cooperative federalism**
- Develop mechanisms to **formulate credible plans (village level)**
- Interests of **national security** in economic strategy and policy
- Special **attention to weaker sections**
- Provide advice and encouragement to partnerships between **key stakeholders, national-international Think Tanks, research institutions**
- Create **knowledge, innovation and entrepreneurial support system**
- **Platform for** inter-sectoral and inter-departmental **issues resolution**
- Maintain **state-of-the-art Resource Centre**

NITI Aayog vs Planning Commission

NITI Aayog	*Planning Commission*
Advisory Think Tank	Extra-constitutional body
Wider expertise	Limited expertise
Secretaries (CEO) appointed by PM	Secretaries appointed by usual process
Bottom-up approach	Top-Down approach
No Mandate to impose policies	Imposed policies on states
No power to allocate funds	Allocated funds to ministries/state govts

Major Initiatives

- SDG India Index
- Atal Innovation Mission
- e-AMRIT Portal (electric vehicles)
- Good Governance Index
- India Innovation Index
- Aspirational District Programme
- 'Methanol Economy' programme

Issues

- **No powers** in granting **discretionary funds** to states
- Only an **advisory body**
- **No role in influencing private or public** investment
- **Politicisation of the organisation**
- **Lacks the requisite power** to bring positive change

Drishti IAS

Drishti Mains Question:

Discuss the role of State Science and Technology Councils in promoting decentralised scientific governance in India. Highlight the key challenges they face in fulfilling this mandate.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q.1 Which of the following statements is/are correct regarding National Innovation Foundation-India (NIF)? (2015)

1. NIF is an autonomous body of the Department of Science and Technology under the Central

Government.
2. NIF is an initiative to strengthen the highly advanced scientific research in India's premier scientific institutions in collaboration with highly advanced foreign scientific institutions.

Select the correct answer using the code given below:

(a) 1 only

(b) 2 only

(c) Both 1 and 2

(d) Neither 1 nor 2

Ans: (a)

Q2. 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)

Q3. Atal Innovation Mission is set up under the (2019)

(a) Department of Science and Technology

(b) Ministry of Labour and Employment

(c) NITI Aayog

(d) Ministry of Skill Development and Entrepreneurship

Ans: (c)

Mains

Q. Discuss India's achievements in the field of Space Science and Technology. How the application of this technology helped India in its socio-economic development? (2016)