Science, Technology and Innovation Policy

Context : Draft of 5th National Science, Technology, and Innovation Policy finalised.

Background : The draft of the 5th National Science Technology and Innovation Policy has been finalized and is now available for public consultation. The policy drafted through a4 track process of consultations during last 6 monthsaims to bring about profound changes through short, medium and long-term mission mode projects by building a nurtured ecosystem that promotes research and innovation on the part of both individuals and organizations.

It aims to foster, develop, and nurture a robust system for evidence and stakeholder-driven STI planning, information, evaluation, and policy research in India. The objective of the policy is to identify and address strengths and weaknesses of the Indian STI ecosystem to catalyse socio-economic development of the country and also make the Indian STI ecosystem globally competitive.

Philosophy behind Draft Proposal

The 5th national STI policy (STIP) follows core principles of being decentralised, evidence-informed, bottom-up, experts-driven, and inclusive. It aims to be dynamic, with a robust policy governance mechanism that includes periodic review, evaluation, feedback, adaptation and, most importantly, a timely exit strategy for policy instruments.

The STIP will be guided by the vision of positioning India among the top three scientific superpowers in the decade to come; to attract, nurture, strengthen, and retain critical human capital through a people-centric STI ecosystem; to double the number of full-time equivalent (FTE) researchers, gross domestic expenditure on R&D (GERD) and private-sector contribution to GERD every five years; and to build individual and institutional excellence in STI with the aim of reaching the highest levels of global recognition and awards in the coming decade. It aims to outlines strategies for strengthening India's STI ecosystem to achieve the larger goal of Atmanirbhar Bharat.

Open Science Framework

It speedup more equitable participation in science through increased access to research output; greater transparency and accountability in research; inclusiveness; better resource utilisation through minimal restrictions on reuse of research output and infrastructure; and ensuring a constant exchange of knowledge between the producers and users of knowledge.

It is important to make publicly funded research output and resources available to all to foster learning and innovation. STIP provides a forward-looking, all-encompassing Open Science Framework to provide access to scientific data, information, knowledge, and resources to everyone in the country, and to all who are engaging with the Indian STI ecosystem on an equal partnership basis.

This framework will be largely community-driven, and supported with necessary institutional mechanisms and operational modalities.

Output from research that is not funded by the government will be outside the purview of this framework. However, they will be encouraged to participate in this framework. Since the scheme of providing open access is applicable to every Indian, private-sector researchers, students, and institutions will also have the same accessibility.

One Nation, One Subscription

It aims to democratise science by providing access to scholarly knowledge to not just researchers but to every individual in the country. Scientists are producers of scientific knowledge in the form of scholarly articles, but the consumers of this knowledge — such as line departments, innovators, industry, the society at large, etc., — are several times larger in number. But in the present mechanisms, they do not have access to this knowledge.

R&D institutions in India spend huge amounts of money subscribing to journals, especially the international high impact-factor ones. As per a rough estimate, this amount comes to nearly Rs 1,500 crore per annum. But still, only a third of the country's total 3.5 lakh-odd researchers get access to these journals. Researchers in remote areas, poor students who cannot pay for such articles, or those who are not part of government institutions, do not have access to this scholarly knowledge.

The STIP envisions free access to all journals, Indian and foreign, for every Indian against a centrally-negotiated payment mechanism. This amount may be higher than what our institutions together pay today, but will facilitate access to India's over 1.3 billion people.

Significance of the Given Draft Proposal

India has valued the participation of women in science and education from ancient times. Some of the earliest women scientists, including Leelavati, Gargi, and Khana, made significant contributions to mathematics, nature science, and astronomy.

Over the last six years, the participation of women in S&T has doubled in India; however, overall participation of women in R&D continues to be only about 16%. While there has been considerable improvement in the participation of women in science education both at the Bachelor's and Master's levels (53% and 55% respectively as per AISHE 2019), there is a persistent gap at the doctoral level between male (56%) and female graduates (44%).

The Department of Science and Technology has initiated several schemes in recent years to promote and encourage the participation of women in science. While the schemes have made great progress, policy interventions will bring transformative change. To address the issue of inclusion and equity in a holistic way, an Indian version of the Athena SWAN Charter (a global framework to support gender equality in higher education and research, especially in science, technology, engineering, mathematics and medicine) is needed.

Funding to Research & Development

India's gross domestic expenditure on R&D (GERD) is quite low compared to other major economies that have a GERD-to-GDP ration of 1.5% to 3%. It is only 0.6%. This can be attributed to inadequate private sector investment (less than 40%) in

R&D activities in India; in technologically advanced countries, the private sector contributes close to 70% of GERD.

STIP has made some major recommendations in this regard, such as expansion of the STI funding landscape at the central and state levels enhanced incentivisation mechanisms for leveraging the private sector's R&D participation through boosting financial support and fiscal incentives for industry and flexible mechanisms for public procurement; and creative avenues for collaborative STI funding through a portfolio-based funding mechanism called the Advanced Missions in Innovative Research Ecosystem (ADMIRE) programme to support distributed and localised collaborative mission-oriented projects through a long-term investment strategy.

Conclusion

The last year 2020, has been a year of science for India and the world. There is a growing realisation that science can address some of the pressing problems of society, in sectors such as health, energy, and water. Science brought quick and effective solutions against the challenge of Covid-19, by producing protective and diagnostic kits, and developing vaccines.

In India, the pandemic presented an opportunity for R&D institutions, academia, and industry to work with a shared purpose, synergy, collaboration and cooperation, which helped the country develop the capability to produce these kits in record time. The STIP draft focuses on the need to adopt such learnings for greater efficiency and synergy in future.

Connecting the Article

Question for Prelims : Consider the following statements regarding the recently released Draft on National Science, Technology, and Innovation Policy:

1. It proposes lateral entry of scientists in related Ministries.
2. It aims to being decentralized, evidence-informed, bottom-up, experts-driven, and inclusive.

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 and 2

Question for Mains : As India and the world reorient in the present context of the COVID-19 crisis, a new Science, Technology, and Innovation Policy (STIP) was initiated at this crucial juncture during mid-2020. Discuss.

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