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“Policy changes and the development of deep tech sectors are expected to stimulate domestic innovations and production”

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With an aim to support and nurture the unique requirements of deep tech startups in India, the government of India has released a draft policy called the National Deep Tech Startup Policy (NDTSP) in July 2023. The draft policy is strategically formulated to ‘stimulate innovation, spur economic growth, and promote societal development’ by effectively utilizing deep tech research-driven innovations. India's deep tech vision encompasses four key pillars: securing India's economic future, progressing towards a knowledge-driven economy, bolstering national capability and sovereignty through the Atmanirbhar Bharat imperative, and encouraging ethical innovation. The policy will aim to provide a comprehensive framework to address the challenges faced by deep tech startups and provide definitive policy interventions to enhance the ecosystem. Prof. Ajay Sood, Principal Scientific Advisor to the Government of India, in an interaction with BioSpectrum, spoke about the tools needed to shape India’s deep tech startup landscape, and the role NSTDP will play.

What are the key aspects required for the growth and sustenance of India’s deep tech sector?

Capacity Building: Enhance the skills of the current generation and educate young minds by incorporating relevant curricula in educational institutions. Provide opportunities for the existing workforce to upgrade their skills through professional development courses.

Capacity building and attracting and retaining talented human resource by - introducing specialised courses, bridging industry academia gap through guest lectures, mentorship programs, and fostering collaboration between international and Indian universities.

Boosting Research and Development: Promote and financially support research in emerging fields, also in basic research in addition and applied and translational research activities. This needs to be achieved through a combination of government grants and investments from the private sector.

Currently, India's R&D is primarily driven by the government. Despite improvements in our Global Innovation Index (GII) ranking from 81 in 2014 to 40 in 2023, data from 2020 shows that our global share in total patents granted is only 2 per cent. Increased participation from the industry in setting goals, providing funding, etc., will enhance the R&D ecosystem and the inclusion of emerging technology. A case in point is the space sector, where modifications are aimed at increasing India's share in the global space economy from the current 2 to 10 per cent in the near future. The establishment of IN-SPACe introduces the necessary regulatory measures for the private sector's involvement in space activities.

Nurturing the Research, Development & Innovation ecosystem in the country should be one of the overarching priorities to build a stronger foundation for the future preparedness in the emerging domains of science and technology. It is also essential to synergize collaborative research between diverse stakeholders including academia, industry, central and state government.

Regulatory Framework and Standards: It is crucial to put in place conducive policies and regulations that encourage innovation while safeguarding society from potential risks. For example, rising needs and concerns w.r.t data privacy for AI applications in healthcare. In case of emerging and disruptive technologies, setting standards is important to meaningfully structure interactions among the stakeholders. To provide a safe environment for testing functionality and potential risks regulatory sandboxes are important. While setting standards for emerging domains of science and technology in India, involvement of international players should be based on sectoral sensitivities and strategic implications.

Global Collaboration: Science and Technology (S&T) pursuits are global endeavors and do not operate in isolation. By fostering collaboration with international partners, India can leverage expertise in adopting, developing, and scaling technologies. This will pave the way for successful integration of emerging technologies into the R&D landscape, ensuring India's future competitiveness.

Public Engagement: Engaging the public in discussions about the future of science and technology can help ensure that these developments align with societal values and needs.

Stronger Intellectual Property Rights (IPR) Regime - To foster a climate of trust and encourage innovation by ensuring creators have their work protected internationally it is important to actively engage in discussions within global IP conventions and strengthen cross-border IP protection.

Addressing the patenting landscape for emerging technologies and ensuring clear guidelines for these emerging fields can encourage responsible innovation and attract investment in these critical sectors.

Can developing the niche deep tech sector in India's biotechnology landscape contribute to boosting domestic production of cutting-edge technologies, novel drugs, and therapies?

Quick answer, Yes. Over the past decade, India's biotech sector has experienced significant growth in various aspects, including capacity, capabilities, and market demand. This growth is evident in the surge of biotech startups, which have increased from 50 in 2012 to over 6000 today. The bio-economy has added $10 billion over the past decade and is projected to exceed $100 billion by 2025.

India's expanding expertise in areas such as digital public infrastructure, advanced data analytics and ongoing technology mission programs such as on AI and Quantum will further bolster the capabilities of the biotech sector. India's advanced digital capabilities can be harnessed to develop new drugs and therapies.

Moreover, India is making strides in developing its indigenous population genomics dataset and analysing its microbiome, which will enhance precision medicine/healthcare approaches.

Currently, India imports about 80 per cent of its medical hardware and devices. However, policy changes and the development of deep tech sectors are expected to reduce imports and stimulate domestic innovations and production.

How will the government look to boost the deep tech startup ecosystem, especially in the life sciences and pharma domains?

According to the Department for Promotion of Industry and Internal Trade (DPIIT) data, India is home to more than 1,17,000 startups in 2023, with nearly 10,000 of them being in the deep tech sector. The proposed National Deep Tech Startup Policy (currently under the final stage of approval) is aimed at encouraging the integration of emerging technologies and advancing societal growth through the effective use of research-driven deep tech innovations.

Deep tech startups are distinguished by their extended gestation period compared to other startups. Among many key priorities unique to deep tech, the proposed national deep tech startup policy aims to (a) facilitate access to a variety of capital sources, (b) establish and share facilities for product prototyping and validation, (c) encourage the public and private sectors to adopt indigenous deep technologies, and (d) create a favorable regulatory environment for innovation to flourish.

NDTSP aims to also address the diverse challenges encountered by deep tech startups across various sectors. These challenges differ in magnitude depending on the sector, necessitating customised interventions. Acknowledging the distinct risks and opportunities within the life sciences and pharmaceutical domains, a tailored approach is essential. Rather than adopting a one-size-fits-all strategy, sector-specific strategies need to be deployed by concerned agencies to foster innovation in these crucial domains.

When will the draft NDTSP policy become a reality?

The current draft version of the NDTSP is truly a stakeholder-driven document incorporating inputs came through different rounds of consultations and public feedback mechanism. At present, the policy is going through its final stage of inter-ministerial consultations leading up to the cabinet approval process, coordinated by the DPIIT. We expect to have this policy enacted as soon as possible.

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