

Takshashila Blue Paper: Re-energising India's biotech ecosystem

Summary of
Roundtable discussion
held at Takshashila
Institution on
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Background

Biotech & healthcare is crucial for economic revival

Global demand for biotech will rise

1. During & after the pandemic, public and private expenditure on healthcare and wellness will drive global demand
2. Biotech is seeing demand surge
3. Healthcare services, pharmaceuticals, diagnostic testing and clinical trials will see high global demand
4. Disruption in global supply chains has created a brief window of opportunity for Indian industry

Necessary to upgrade our industry base

1. Greater investment in R&D, education & skilling necessary to be globally competitive
2. India must create & own key intellectual property across the sector
3. Opportunity to be both self-reliant and a global export house

Recognising biotech's economic potential

Within India

Union Minister of State (Independent Charge) Science & Technology; Minister of State (Independent Charge) Earth Sciences; Dr Jitendra Singh released India's Bioeconomy Report 2022 and pointed out that India's Bioeconomy has reached over 80 billion US Dollars in 2021 recording 14.1% growth over \$70.2 billion in 2020. He added that the Bioeconomy is likely to touch 150 billion dollars by 2025 and over 300 billion dollars by 2030.

Outside India

1. More than 50 countries have a dedicated bioeconomy strategy or related policies – OECD report on Meeting Policy Challenges for a Sustainable Bioeconomy, published 2018.
2. US passed an Executive Order on Advancing Biotechnology and Biomanufacturing Innovation for a Sustainable, Safe, and Secure American Bioeconomy in 2022

Roundtable Discussion

Objective and Participants

The objective of the roundtable was to discuss key challenges and identify actionable solutions to strengthen India's biotechnology sector. The discussion was based on recommendations adapted from "Takshashila Working Group, Biotech 2025: From lifesaver to economic change, Takshashila Discussion SlideDoc, November 2020".

Participants:

Kavitha Iyer-Rodrigues, CEO & Founder, Zumotor Biologics Inc.

Sunil Laxman, Principal Investigator, InStem

Shruthi Vembar, Assistant Professor, IBAB

Varsha Sridhar, CEO & Co-Founder, Molecular Solutions Care Health LLP

Anupam Manur, Assistant Professor, Takshashila Institution

Saurabh Todi, Research Analyst, Takshashila Institution

Manoj Kewalramani, Chairperson, Indo-Pacific Research Programme, Takshashila Institution

Shambhavi Naik, Head of Research, Takshashila Institution

Funding (1/8) Government

Government funding in biotech sector is low, with the entire Ministry of Science and Technology receiving only 0.05% of GDP.

Funding has to increase and be focused on specific areas of national interest.

Challenges

- Government funding for biotech research/start ups is low (MoST funding is ~0.05% of India's GDP).
- Funding is scattered across multiple institutions and areas, leaving low amounts to be allocated per recipient. (DBT-BIRAC for example, allocates INR 50 lakh as an award, but it is not sufficient to scale a biotech product)
- Funding is often delayed.

Discussion

Funding to Ministry of Science is low and is controlled by the Ministry of Finance. Empowering Ministry of Science to control its funds would help resolve issues with funding delays and provide flexibility in funding specific projects.

Funding (2/8) Government

Government funding in biotech sector is low, with the entire Ministry of Science and Technology receiving only 0.05% of GDP.

Funding has to increase and be focused on specific areas of national interest.

Discussion

Current funding is distributed across multiple recipients, resulting in starting up of many projects. However, since these recipients receive only small sums, most projects/startups are unable to sustain themselves after some time. Roadmap visibility with INR 50 Lakhs for a biotech company may only be for a few months. This has created a situation where we have several startups in the space, but not many companies who have successfully completed products.

Funding (3/8) Government

Government funding in biotech sector is low, with the entire Ministry of Science and Technology receiving only 0.05% of GDP.

Funding has to increase and be focused on specific areas of national interest.

Proposed Solutions

- Government funding should create programmes to take new products from innovation to market: for e.g. seed fund for 1000s of companies, then increase funding for select companies that show promise
- Focused funding on creating bioclusters which could facilitate growth of public and private biotech institutions
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Funding (4/8) Philanthropic

Philanthropic funding in biotech sector is low.

There might not be capacity for philanthropists/philanthropic institutions to evaluate potential of biotech products/startups.

Challenges

- Instances of Philanthropic funding (for example, through Tata Trusts or Bill and Melinda Gates Foundation) for biotech in India are limited.
- Long gestation periods, uncertainty of impact and lack of expert understanding of the biotech sector likely reduces the interest of philanthropic donors

Discussion

There may not be immediate impact of funds given for biotech research. This might reduce the priority given to biotech research compared with other civil projects or projects with immediate, tangible social impact.

Funding (5/8) Philanthropic

Philanthropic funding in biotech sector is low.

There might not be capacity for philanthropists/philanthropic institutions to evaluate potential of biotech products/startups.

Discussion

Philanthropists or companies not involved in the biotech sector may not have personnel with adequate expertise to evaluate eventual impact of biotech research, including assessment of benefits or probability of success. This uncertainty may also reduce likelihood of philanthropic or CSR funding been given to the biotech sector.

Funding (6/8) Philanthropic

Philanthropic funding in biotech sector is low.

There might not be capacity for philanthropists/philanthropic institutions to evaluate potential of biotech products/startups.

Proposed Solutions

- Capacity building within companies to identify potential opportunities in biotech sector
- A platform to give visibility to vetted biotech startups/researchers interested in raising funding. The platform could provide insights into the research being conducted, its market significance, potential benefits and the need for funding.

Funding (7/8) Private sector

Private funding - Private equity/Venture Capitalist in biotech sector is low.

There may not be a clear exit strategy for the investor. There are very few biotech focused PE/VC investors.

Challenges

- No clear exit strategy for investors
- Investors cannot gauge the benefits and risks of new biotech products since there are no biotech experts advising investors
- Demand uncertainty for existing products such as insulin, etc. reducing investment in biomanufacturing

Discussion

The absence of guaranteed demand, lack of capacity to evaluate benefits and regulatory inconsistencies may be reasons behind the low interest of private funding in India's biotech sector.

Startups seeking private funding tend to approach institutional investors outside India. These investors are able to bet the huge capital investment required for sustaining biotech product development.

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Proposed Solutions

- Allow 100% FDI in pharmaceutical companies
- Increase access to markets through advanced purchase agreements or streamlining of export controls to increase investor confidence - this guaranteed demand may boost investor confidence
- Production Linked Incentive schemes to decrease barriers for fund raising
- Capacity building within PE/VC firms to identify potential opportunities in biotech sector

Human Resources (1/2)

Biotech sector growth depends on presence of non-skilled labour, skilled and highly-skilled labour. India currently has non-skilled and highly-skilled labour but not enough skilled labour to scale up biotech operations.

Challenge

Operations in the biotech sector require unskilled, skilled and highly skilled labor. India has a dearth of skilled labor.

Discussion

Basic skilling requires knowledge of biotech techniques and theory. The undergraduate programmes in majority of Indian universities do not provide exposure to practical knowledge. PhD holders with adequate exposure may be suited for select managerial/research positions, but not for all jobs. Hiring them could increase operations costs. Thus, there is a need for human resources with basic understanding of biotech theory and exposure to a certain range of biotech techniques.

The Biotech Industrial Training program is a good initiative, but is limited by participation from biotech companies and depends on their efforts to skill participants.

Human Resources (2/2)

Biotech sector growth depends on presence of non-skilled labour, skilled and highly-skilled labour. India currently has non-skilled and highly-skilled labour but not enough skilled labour to scale up biotech operations.

Proposed solution

In addition to The Biotech Industrial Training program, an accredited course can be created to train more Bachelors and Masters students with key biotech skills. This course can be run by private or public institutions. A draft structure could be a 3 month structured programme to cover basic skills such as pipetting, buffer making, electrophoresis and PCR along with understanding of associated calculations. A second training programme can be set up to deep dive into techniques like bioprocessing, RT-PCR, etc.

The setting up of foreign institutions in partnership or standalone entities would create a competitive atmosphere for more research-led education.

Infrastructure

Lack of access to infrastructure prevents optimal use and stems the speed of innovation

Challenge

Currently, India does not have enough infrastructure to foster innovation and scaling up of manufacturing. The existing infrastructure is present in distributed locations, preventing its optimal use.

Proposed Solution

Government should invest in building bioclusters centered around a common theme - either technique/service such as bioprocessing or gene sequencing or clinical trial hub or a particular product such as CAR-T therapies.

Thank You