

POLICY BRIEF

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**Entrepreneurship
Development Institute of India**
Ahmedabad



Indian Biotech Industry: Entrepreneurship and Policy Environment

1. Introduction

It is required that a nation should harness the potential of biotechnology as a premier precision tool for its national development and the well-being of society. The remarkable march of India into the world of biosciences and technological advances that had begun in 1986 under the aegis of the Department of Biotechnology, Ministry of Science & Technology, the Govt. of India, has been, ever since, providing an enabling ecosystem to promote biotechnology research and improved capacity building across the country. Aligning with the mission of creating an Atmanirbhar Bharat, interventions are made to build and strengthen a strong education, research, and translation ecosystem in order to make India a global player. In this context, nurturing a vibrant start-up, entrepreneurial and industrial base in the country and positioning India as a strong bio-manufacturing segment for innovative, affordable, and accessible products for the society and also for global markets is the key focus.

United Nations have given 17 Sustainable Development Goals (SDGs), which are aimed to alleviate poverty, protect the planet, and ensure that people enjoy peace and prosperity by 2030. Effective global collaboration is crucial to achieve the UN SDGs, which requires an understanding of the needs of individual countries and their expectations related to bioeconomy. Bioeconomy or biotechonomy refers to economic activity involving the use of biotechnology and biomass in the production of goods, services, or energy. It is gaining immense attention across the globe in the wake of geopolitical tensions, environmental pollution, climate change, and loss of biodiversity. Biotechnology occupies a central place in policy discussions when it comes to the impact of biotechnological interventions on human life as well as the economic growth of nations.

Reiss et al. (2005) has defined, seven policy areas covering nine policy goals for potential policy intervention in biotechnology innovation systems. This benchmarking concept for biotechnology policies combines the portfolio of national biotechnology policies with the national performance in biotechnology (Figure 1).

“During these extraordinary times, economies across the globe are doing their best to mitigate the impact of COVID-19. Economies are today thinking out-of-the-box, encouraging new practices and protocols to ensure an economically gainful and healthy environment for their populace. Among several measures, the focus on Biotechnology related interventions has not only been particularly instrumental in addressing several pressing issues related to the health system but also played a major role in streamlining the economic structures.

I am happy to present this Policy Brief which focuses on understanding the 'Biotechnology Policy Ecosystem' in the country. The role of and scope for entrepreneurship have also been outlined. Against the backdrop that Bio-entrepreneurship is the call of the day, the document evaluates, assesses, and makes suggestions for strengthening the policy environment. My heartiest congratulations to EDII's Department of Policy Advocacy, Knowledge, and Research for this effort.”

Dr. Sunil Shukla
Director General, EDII

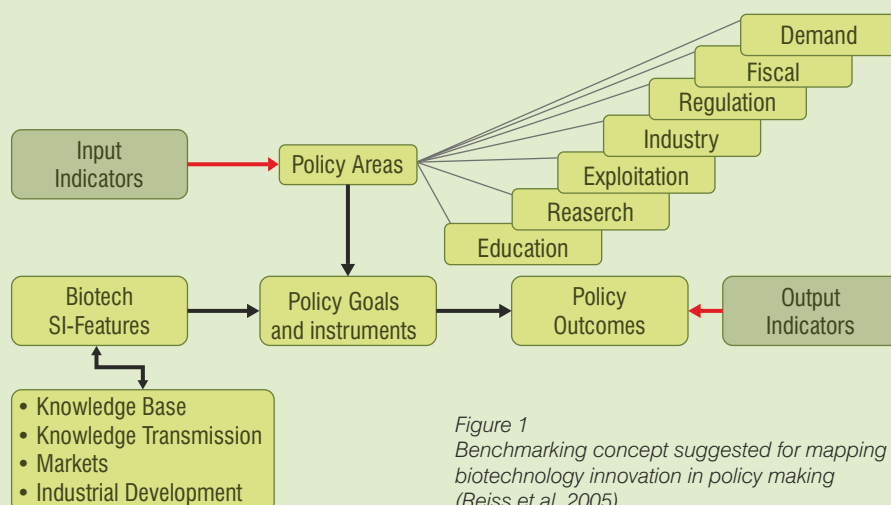


Figure 1
Benchmarking concept suggested for mapping
biotechnology innovation in policy making
(Reiss et al. 2005).

2. Global Premise of 'Bioeconomy'

Different nations have developed their own regulatory framework and bioeconomy strategies as robust mechanisms for strengthening their respective economy using biological resources. The bioeconomy strategies and definitions of different countries tend to vary with the countries' technological capacity, natural resource base, and comparative economic advantage. A cross-cultural comparison of the bioeconomy strategies of various countries suggests that an emphasis has been given to creating and promoting an entrepreneurial culture in the national Bioeconomy strategies of almost all the economies. However, several economies specifically support the start-up ecosystem to encourage innovation in the biotechnology sector (viz. global investment for boosting start-up ecosystem is promoted in Japan). There is a proactive attempt to create conducive environments with a set of different initiatives (like competitions, and fairs are carried out in Costa Rica). Entrepreneurship skills need to be instilled in the first instance in biotechnologists in order to develop a pool of Biotechnopreneurs. Several economies have emphasized the importance of capacity building and implemented practices to do so. These include Germany, Italy, Latvia, Finland, France, South Africa, Malaysia, the United States of America, and Japan.

3. Indian Biotechnology Landscape

The Indian Bioeconomy grew by more than 12.3 % in 2020 to reach \$ 70.2 billion. Indian biotechnology industry's economy was valued at \$62.5 billion for the calendar year 2019 as against \$51 billion in 2018 and \$44.47 billion in 2017. The share of Bioeconomy in the national GDP has been rising steadily in the last few years. The share now stands at 2.7 % against 2.2 % in 2019. In India, the various biotechnology sectors with a focus on entrepreneurship include biopharmaceuticals and healthcare, bioindustrial sector, agriculture, and bio-services (Natesh and Bhan 2009). The contributions of various sectors to the Indian Bioeconomy in 2020 are shown in Figure 2.

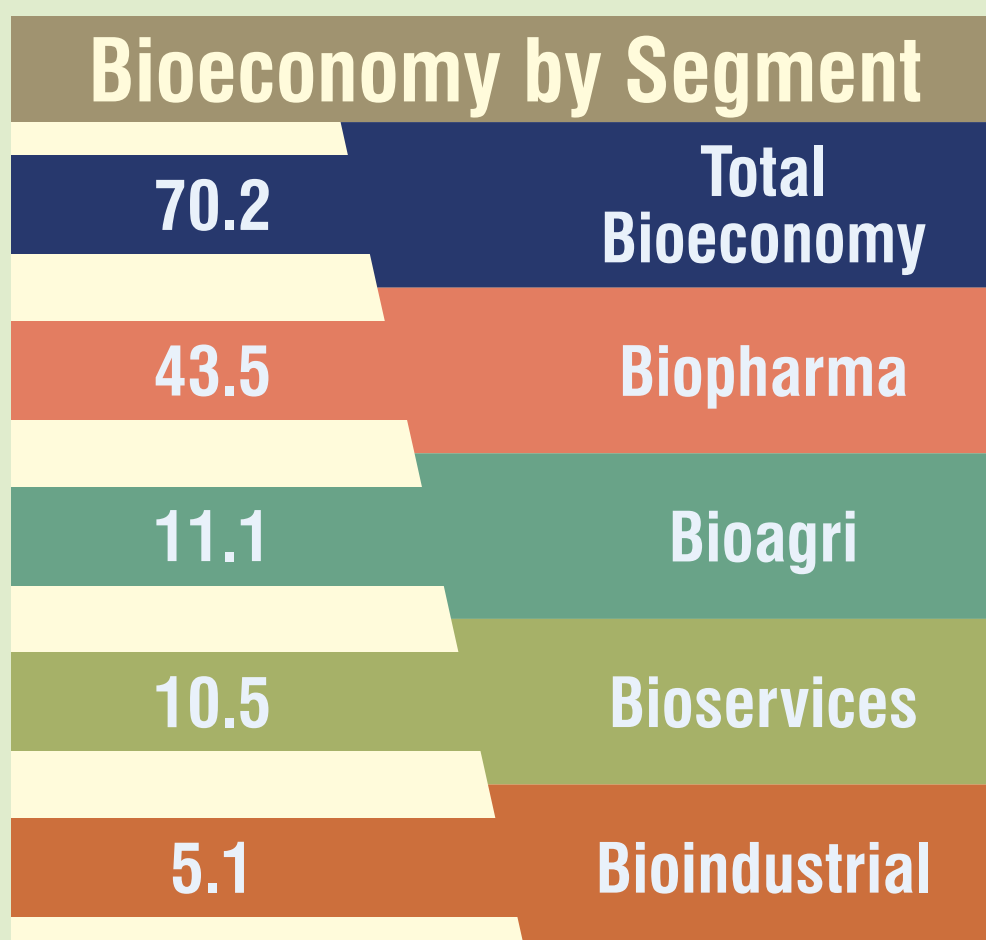


Figure 2 Contribution of various Biotechnology sectors to Indian Bioeconomy, 2020
(Source: India Bioeconomy Report 2020)

Figure 3 depicts a comparison between similar sectors across 2019 and 2020 and underscores the growth in the Pharma sector. It is important to note that 2020 was affected by the COVID19 Pandemic.

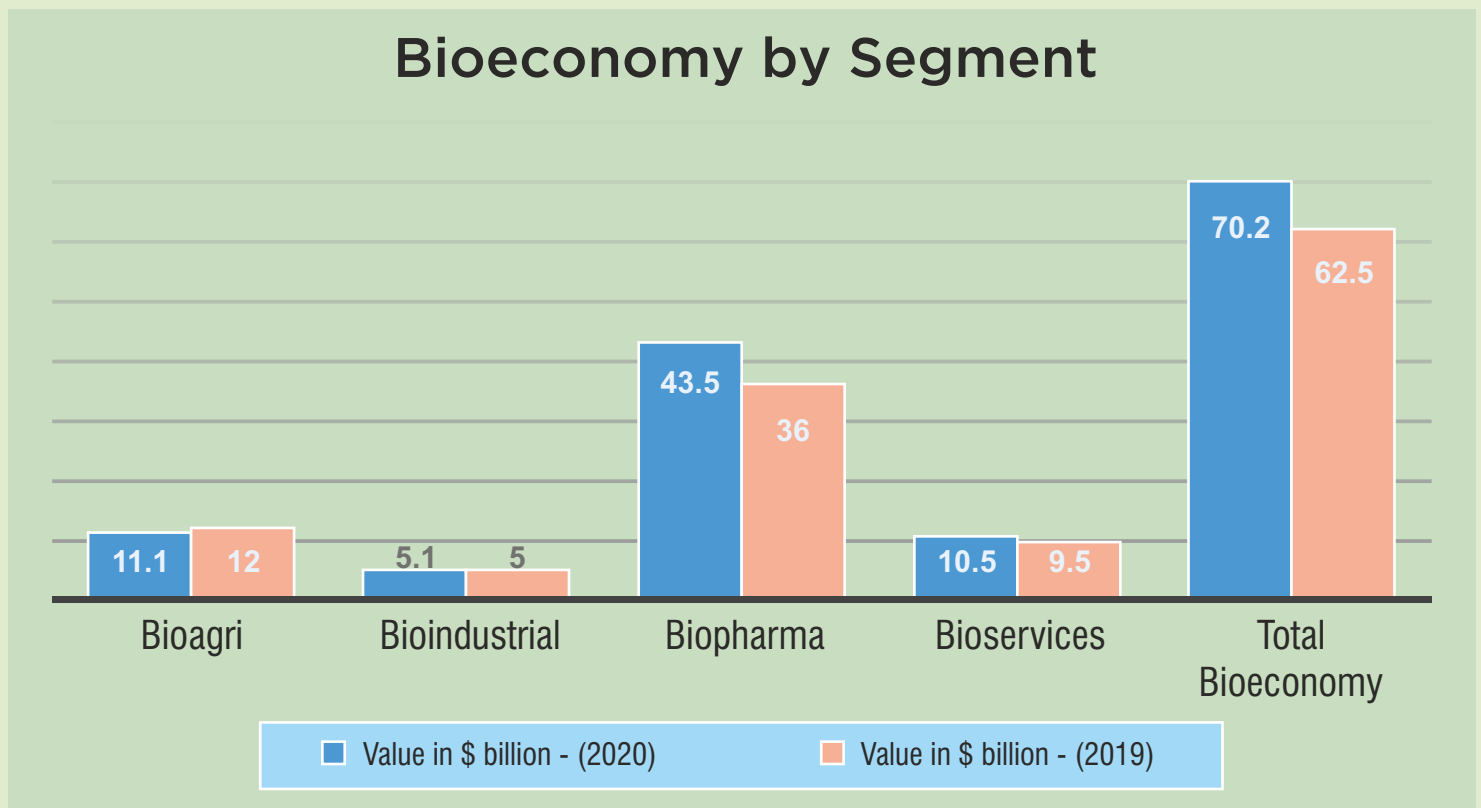


Figure 3 Contribution of various Biotechnology sectors to Indian BioEconomy (Source: India BioEconomy Report 2021)

- Biopharmaceuticals is the largest biotechnology sector in India making up around 62% of the revenues (domestic as well as exports) of the Indian Biotechnology industry (India Bioeconomy Report 2021). This sector includes vaccines, therapeutics, and diagnostics. The BioPharma segment generated \$43,5 billion in value, up by \$7.5 billion compared to last year's \$36 billion.
- India's agricultural biotechnology sector is one of the key players in the world with progress across the forefronts of technologies and products in Ribosomal DNA, transgenics, plant tissue culture, floriculture and molecular marker assisted plant breeding processes and is the second largest contributor to the Indian Bioeconomy. The segment contributed 16% (India Bioeconomy Report 2021).
- Bio-services, which accounted for 15% of the biotechnology industry in 2020, is becoming a leading area for clinical trials, contract research, and manufacturing activities in the country. This sector's expertise includes, software capabilities, well developed public R&D infrastructure and an efficient scientific taskforce.
- The Bioindustrial sector is the fourth major contributor (7%) of the Indian Bioeconomy segment. It comprises the enzymes and biofuels segments.
- Majority of institutions imparting Biotechnology education at the graduation, post-graduation as well as doctoral levels are funded by University Grants Commission (UGC), Department of Biotechnology (DBT) and Indian Council of Agricultural Research (ICAR).
- BioFuels, BioPlastics, Biomass, and BioEnergy have seen strong push in 2020. The innovation-led entrepreneurship continued despite the pandemic in 2020 and the BIRAC-ABLE report has recorded the emergence of 840 biotech startups in 2020 to take the total number to 4,237. About 61 % of these startups are in the biomedical segment including biopharma, medical technologies and diagnostics.

4. Biotechnology Policy Ecosystem in India

The biotechnology regulation and policy mechanism in India operates at the Central as well as regional (State government) levels. At the central level, India's biotechnology regulatory governance is monitored by three ministries- Ministry of Environment; Forest and Climate Change; Ministry of Science and Technology; Ministry of Agriculture and National Biodiversity Authority. At the state levels, various govt. bodies maintain and regulate the biotechnology sector, tailor-made to suit the needs of respective regions. Therefore, the biotechnology related regulations and policies differ from state to state.

Central policies and regulations in Biotechnology

The central policies as well as regulations in Indian Biotechnology sector during the past several years include,

- Rules for the manufacture, use, import, export and storage of hazardous microorganisms/genetically engineered organisms

Significant Facts

- The innovation-led entrepreneurship continued despite the pandemic in 2020 and the India BioEconomy Report, March 2021 has recorded the emergence of 840 biotech startups in 2020 to take the total number to 4,237. About 61 % of these startups are in the biomedical segment including biopharma, medical technologies, and diagnostics.
- India is among the top 12 destinations for biotechnology worldwide. The industry comprises around 5000 biotech companies, with the number of startups expected to touch 10,000 by 2024. (IBEF Report 2022)
- In the Union Budget 2022-23, the Department of Biotechnology was allotted Rs. 2,581 crores for developing basic infrastructure, genetic engineering, technologies and bioinformatics, agriculture biotechnology, and training skilled professionals.
- India's BioEconomy size has grown by more than 12.3 % in 2020 to reach \$ 70.2 billion.
- The share of BioEconomy in the national GDP stands at 2.7 % in 2020 against 2.2 % in 2019.
- The Biotechnology regulation and policy mechanism in India operates at the Central as well as regional (State government) levels. The Central and State Governments have launched several pioneering schemes to build an entrepreneur-friendly ecosystem in the country. And the emphasis on "vocal for local" is expected to only further strengthen its resolve.
- In November 2021, Minister of Science & Technology inaugurated a new Biotechnology Centre for Northeast in the remote area of Kimin (Arunachal Pradesh). A pan-India Star College Mentorship Programme for young innovators supported by the Department of Biotechnology was also launched.
- The Government of India and Karnataka government funded Biomoneta, a start-up that developed an air decontamination technology which eliminates airborne Covid-19 virus in any closed setting.
- In August 2021, the Central Council for Research in Siddha (CCRS) introduced ARIVU (Academia-industry Research Incubation for Value-chain Up-gradation), an initiative to motivate academics and the industry to carry out research to advance value-chain in industries such as biotechnology and nanotechnology.
- In October 2021, the Department of Biotechnology launched a 'One Health' consortium that will survey important bacterial, viral and parasitic infections of zoonotic as well as transboundary pathogens in the country. The consortium consists of 27 organisations and is led by the DBT-National Institute of Animal Biotechnology, Hyderabad.
- The National Biotechnology Development Strategy [2020-2025], given by Department of Biotechnology, Govt. of India, is India's vision towards invigorating Indian biotechnology sectors' contributions to a 'knowledge and innovation driven BioEconomy'.
- The draft National BioEconomy Strategy envisages India to be within the top 5 best performing bio-economies by establishment as a 'Global Bio-manufacturing Hub' by 2025, showing a remarkable growth of \$150 Billion.

or cells, under the Environment Protection Act, 1986 (EPA),

- S&T Policies of Central Government
- 'Biosafety Protocol' Ratification (2003) by Ministry of Environment and Forests (MoEF)
- National Intellectual Property Rights Policy (2016)
- National Policy for Skill Development and Entrepreneurship (2015)
- National Health Policy (2017)
- Bioenergy Roadmap Vision (2020)
- Open Access Policy (2015)
- National Policy on Biofuels (2018)
- Revised FDI Policy (2019-20)
- The DNA Technology (use and application) Regulation Bill (2019)
- Make-In-India
- Startup India
- Report on the Application of Agri-Biotech (2004) by Ministry of Agriculture
- The National Biotechnology Development Strategy, 2007, and revised strategy for the years: 2015–2020.

Biotechnology policies of various Indian states

- 20 States and Two Union Territories Have Prepared Their Own Biotechnology Policies. These policies focus on prioritizing biotechnology related issues/ areas of the respective states.
- As an instance, the policy of Andhra Pradesh focuses on increasing the participation of the private sector in developing the biotechnology industry in the state.
- On the other hand, the policy of Assam emphasizes R&D effort in areas such as information technology-based drug discovery, herbal and tribal medicine, etc.
- The policy of Chhattisgarh aims at enabling the communities of Chhattisgarh, who are the custodians of bio-resources heritage, to get optimal advantages of their natural, bio-cultural and bio-knowledge heritage in a sustainable manner.
- Gujarat unveiled a new Biotechnology Policy 2022-27 to strengthen innovation ecosystem. The new policy will promote partnerships between various stakeholders such as NGOs, scientific establishments and industries. It also includes various financial assistance for technology acquisition, skill development, alternative energy production, quality certification, and bandwidth leasing, to make Gujarat's biotechnology industry world class.
- The Policy of Himachal Pradesh (2014) is aimed at translating the state to a prosperous Himalayan Bio-business Hub with the help of biotechnology through scientific and technological empowerment of human resource for enhancing efficiency, productivity, cost effective products, processes and technologies.
- The Policy of Haryana (2002) focusses on several biotechnology sectors for economic growth namely agriculture and horticulture, animal husbandry, food processing, healthcare, capacity building and bioinformatics.
- The Biodiversity and Biotechnology Policy (2010) of Jammu and Kashmir state is aimed at boosting industrial and employment scenario.

- The Policy of Karnataka, emphasizes expanding research and industrial development like genomics, biofuel and contract research. Biotech Parks, Biotech Corridors, Centre for Human Genetics, Institute for Agri-biotechnology, K-Ganga are some specific infrastructural facilities development of biotechnology in the state.
- The Policy of Maharashtra, relies on 'bio-future'. The State has taken notable measures in strengthening institutional mechanisms, infrastructure development as well as attracting investment in biotechnology.
- During the past years, entrepreneurship development has gained a lot of attention in the North-Eastern part of India, as a result of which, 10% of DBT's annual budget is dedicatedly used for promoting development in the North-Eastern India comprising eight states viz. Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura. However, many of these states do not have a defined policy on biotechnology till date. However, biotechnology governing bodies and institutional mechanisms are slowly gaining pace to set stage right for biotechnology in the North-East.
- The Policy (2014) of the Tamil Nadu state government works on several region-specific thrust areas like: Vaccines and recombinant therapeutics, bioactive therapeutic proteins, stem cell research, cell engineering, cell-based therapeutics, clinical trial & outsourcing, bioinformatics, agricultural biotechnology, animal biotechnology, etc.
- The Life Sciences Policy for Telangana (2015–2020) has increased focus of pharmaceutical companies in biotechnology and the thrust areas of the state include biologics & bio-similars, vaccines, medical biotechnology, agricultural biotechnology, industrial biotechnology, marine biotechnology, nanotechnology, regenerative medicine and clinical research.
- The largest state of India- Uttar Pradesh, in its 'Biotechnology Policy' sets forth a vision of becoming more prosperous through harnessing the potential of biotechnology to bring prosperity for farmers, generate employment in rural areas and ensure food security, good health & clean environment.

Despite differing regional concerns and focus, the major focus areas of biotechnology policy development in India include, Agri-biotechnology, medical biotechnology, biosafety issues, environmental biotechnology, food processing, etc. Although, a majority of states have their biotechnology policies in order to strengthen the ecosystem for entrepreneurship to flourish.

National biotechnology development strategy (2020-2025)

The National Biotechnology Development Strategy [2020-2025], given by Department of Biotechnology, Govt. of India, is India's vision towards invigorating Indian biotechnology sectors' contributions to a "knowledge and innovation driven bioeconomy". The draft was given out, in January 2021, and it envisages India to be within the top 5 best performing bio-economies in the world by establishment as a 'Global Bio-manufacturing Hub' by 2025, showing a remarkable growth of \$150 Billion. The focus is on 4 major verticals- (i) Capacity building, (ii) strengthening research-based innovation ecosystem, (iii) Promoting translation and product development commercialization in bio-sectors, and (iv) Maintaining a meaningful balance between basic and translational research, to propel the nation on becoming knowledge intensive in nature.

Significant Facts

- Gujarat Biotechnology Policy 2022-27 aims at providing capital expenditure (CAPEX) and operation expenses (OPEX) assistance to special projects, with upto 25 per cent of the total capital expenditure up to a maximum of Rs 200 crore and up to 15 per cent of the total operating cost up to a maximum of Rs 25 crore per annum. Assistance will also be provided on term-loans of up to Rs 100 crore at an interest rate of seven per cent.
- Atal Jai Anusandhan Biotech Mission was implemented by Department of Biotechnology (DBT), Ministry of Science and Technology. The purpose of this mission is to address the challenges of maternal and child health, antimicrobial resistance, vaccines for infectious disease, food and nutrition, and clean technologies.
- Biotechnology Parks and Incubators are established across the country by the Department of Biotechnology (DBT), under the Ministry of Science and Technology, to translate research into products and services by providing the necessary infrastructure support. These biotechnology parks offer facilities to scientists, and SMEs for technology incubation, technology demonstration, and pilot plant studies to accelerate the commercial development of biotechnology.
- In 2020, India has over 4,237 biotech start-ups, nearly a 25 percent jump in its base since 2019.
- According to the draft regulations released by the Food Safety Authority of India (FSSAI), food companies cannot manufacture or sell any food products or food ingredients derived from genetically modified organisms (GMOs) without prior approval.

COVID Economy:

- By the end of December 2020, all states in the country have done over 165,000,000 Covid-19 tests with approximately 48% percent being based on the RT-PCR method, and 46 percent were based on the Rapid Antigen test. At an average economic cost of Rs 1,500 per test, the Covid-19 testing alone has added nearly \$4 billion to the Bioeconomy in 2020.
- In the case of personal protection equipment (PPE), from almost zero production in the early part of 2020, the country is now producing 500,000 PPE kits daily. In the second half of 2020, the country's 600 + registered units produced around 250,000 PPE kits daily.
- India produced nearly 3.5 million liters of Sanitizers by the end of October 2020. The economic value created in the whole chain is estimated to be \$350 million.
- India's bioplastics market is projected to grow at a CAGR of 23.91% to reach \$754.648 million by 2025 from \$208.475 million in 2019.
- The total production of biodiesel in India as per Statista was 225 million liters in 2020. The revenue generated is roughly \$185 million. But the economic value would be around \$1.2 billion for just Biodiesel.
- Indian companies have set up facilities for nearly 5.5 billion doses of Covid-19 vaccines by 2021.

5. Entrepreneurship in Indian Biotechnology policies

The importance of building a culture of entrepreneurship has been emphasized in all the major biotechnology policies, of the centre or states. A strong emphasis has been put upon building biotech business infrastructure in the form of financial support, incentives, subsidies, etc. for developing biotech parks, incubators, units, start-ups, R&D institutions, etc. Assistance for patent applications, SEED support, skill development, marketing & product development, employment generation initiatives, etc.

6. Suggestions to Posit India on Path of 'Self-reliance' using Biotechnological Interventions

Various policy actions can be suggested with reference to developing an entrepreneurial mind-set in biotechnologists and improving the policy ecosystem in biotechnology:

Inculcating bio-entrepreneurship education and skills at various levels of academic career

The biotechnology/ life science education is inclined toward research and therefore the culture of entrepreneurship is missing in a majority of Higher Education Institutions (HEIs). Despite the inclusion of entrepreneurship module, in the model curriculum of post-graduation courses in biotechnology, by Department of Biotechnology, Govt. of India, this pattern is not uniformly followed by a majority of universities in India. The bio-curriculum usually remains more research oriented and, therefore, the entrepreneurship aspect remains unexplored. As a strategy, a range of training programmes should be designed to meet the entrepreneurship training requirements at different levels of an academic career- viz. basic sensitization programmes for UG/PG students, mid-level technology development and transfer, skill development programmes for Ph.D. and Postdoctoral students, training programmes for faculty and scientists as well as advanced programmes for start-ups and enterprises in specialized biotechnology research areas. Also, there is a need to develop a comprehensive capacity-building exercise for the personnel involved in bio-incubator viz. incubation managers. Also, the teaching methodology must focus more on handholding and domain-specific mentoring for the start-ups and existing entrepreneurs. Various important areas like entrepreneurship, opportunity identification, entrepreneurial canvas development, and developing bridge courses in bio-entrepreneurship and incubation should be emphasized.

Inclusion of technology translation activities in the academic performance indicators

The Academic Performance Indicators (API) measure the accomplishments of the researchers and academicians with reference to research outputs like publications, patents/IPR, academic field visibility in the form of presentations/capacity-building activities on national and international platforms, etc. Along similar lines, the scrutiny process for the award of financial support for bio-entrepreneurship should contain additional weightage for those individuals who have been trained in entrepreneurship skills. This measure can be instrumental in the selection of well-groomed entrepreneurs possessing entrepreneurial skills in addition to a strong innovation portfolio. This will also create a pool of trained scientists with a strong inclination for entrepreneurship.

Incentivization of entrepreneurship and translational activities in biotechnology

Technology translation and entrepreneurship are often overlooked in bio-education which is usually more focused on research. Therefore, incentivization of technology translation activities like filing patents, market testing, incubation and acceleration programmes through institutional framework, etc., will boost the entrepreneurial mind-set and culture in academic institutions where bio-education is being imparted.

Institutional entrepreneurship policies to be put into practice

Entrepreneurship policies should be developed and implemented in accordance with regional and institutional requirements of universities and specialized research institutions. They can either be developed in a standalone mode or in association with the institutional IPR policies.

Strengthening the horizontal as well as vertical linkages

The technology generated from academia is often with low Technology Readiness Levels (TRLs) and low Business Readiness Levels (BRLs). The strengthening of academic-industrial associations, will, therefore, result in more mature and business-ready technologies. Also, collaborative efforts within and among academia at the national and international levels would lead to more efficient innovation, thus promoting global competitiveness. Similarly, the network linkages among the biotech companies, nationally and internationally, should be strengthened by the establishment of industry associations e.g. Association of Biotech Led Enterprises (ABLE), etc. Also, emphasis should be laid upon the identification of auxiliary entrepreneurship and employment opportunities that can be catalyzed by the establishment of fruitful collaborations. Organizing events like technology showcases will strengthen the mechanism of linkages, technology transfer, and commercialization among scientists, non-scientist,s and aspiring entrepreneurs.

Promoting inclusivity and social entrepreneurship in biotechnology to carry out scientific social responsibility

Scientific Social Responsibility (SSR) is the convergence of scientific knowledge and social conscience. A sense of accountability and 'giving back' to society should be cultivated in scientists. Also, biotechnology-based interventions should be used for solving social problems. Another important point to consider is to promote inclusivity and include all the sections of society- youth, women as well as marginalized sections of society.

7. Way forward:

India occupies a firm place on the global biotech map. Biopharma is the leader in biotech space in India, while agribio and bio services are significant streams. The Indian biotech has made a valuable contribution in the management of Covid 19 in India. The industry demonstrated considerable capacity in the realms of virus detection and modelling, diagnostics (e.g. testing), safety (disinfection, sanitation, isolation), treatment (potential drug discoveries as well as repurposing of drugs) and vaccine development and production. The experience and ongoing initiatives underscore a strong outlook for large parts of biotech industry because:

- virus identification and management will remain a continuing global concern
- the need to strengthen Indian healthcare system is now in sharp focus
- there is an excellent opportunity for the sector to leverage its strengths, forge global alliances and become a dominant player in the world market.

Covid 19 has also highlighted the requirement for interdisciplinary work. The other streams of biotechnology industry- agri, industrial- will continue to grow at brisk pace. On the whole, Covid 19 has become a game changer for the Indian biotech industry and it will trigger further growth, hitherto not anticipated. In keeping with such an outlook, we need fresh policy action to realise the potential; capital may not remain a constraint now.

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About EDII:

Entrepreneurship Development Institute of India (EDII), an autonomous and not-for-profit institute, set up in 1983, is an acknowledged National Resource Institute for Entrepreneurship Education, Research, Training & Institution Building. It is promoted by IDBI Bank Ltd., IFCI Ltd., ICICI Bank Ltd. and the State Bank of India (SBI). The Government of Gujarat pledged twenty-three acres of land on which stands the sprawling EDII campus. EDII has been recognized as the CENTRE OF EXCELLENCE by the Ministry of Skill Development and Entrepreneurship, Govt. of India. The Institute has also been ranked as No. 1 under General (Non-Technical Category) by Atal Ranking of Institutions on Innovation Achievements (ARIIA)-2021, Ministry of Education, Govt. of India. To pursue its mission, EDII has helped set up twelve state-level exclusive entrepreneurship development centres and institutes. In view of EDII's expertise in Entrepreneurship, the University Grants Commission had also assigned to it the task of developing curriculum on Entrepreneurship, and the Gujarat Textbook Board assigned to it the task of developing textbooks on Entrepreneurship for 11th & 12th standards. EDII is also working closely with regulatory bodies, like the Central Board of Secondary Education. In order to broaden the frontiers of Entrepreneurship Research, EDII has established Centre for Research in Entrepreneurship Education and Development (CREED), to investigate into a range of issues surrounding small and medium enterprise sector through its publication, 'The Journal of Entrepreneurship'. CREED also establishes a network of researchers and trainers by conducting Biennial Conference on Entrepreneurship Education and Research. EDII also leads the India Chapter of Global Entrepreneurship Monitor (GEM), the largest annual study of entrepreneurial dynamics in the world. In the international arena, efforts to develop entrepreneurship by way of sharing resources and organising training programmes, have helped EDII earn accolades and support from the World Bank, Commonwealth Secretariat, ILO, FNSI, British Council, Ford Foundation, European Union, ASEAN Secretariat and several other renowned agencies. EDII has also set up Entrepreneurship Development Centre in Cambodia, Lao PDR, Myanmar, Vietnam and Uzbekistan, Rwanda and is in the process of setting up such centres in select African countries.

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The Department of Policy Advocacy, Knowledge and Research (DPA) is a dedicated department for formulation and advocacy of 'Public Policies', creation of 'Knowledge Products', and publication of 'Research Studies'. The DPA conducts various government-supported and inhouse sponsored research studies as well. The DPA focuses on the creation of indigenous 'Knowledge Products' for institutions, entrepreneurs, students, and policymakers.



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