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Can technology uplift the Indian BioSuppliers ecosystem?

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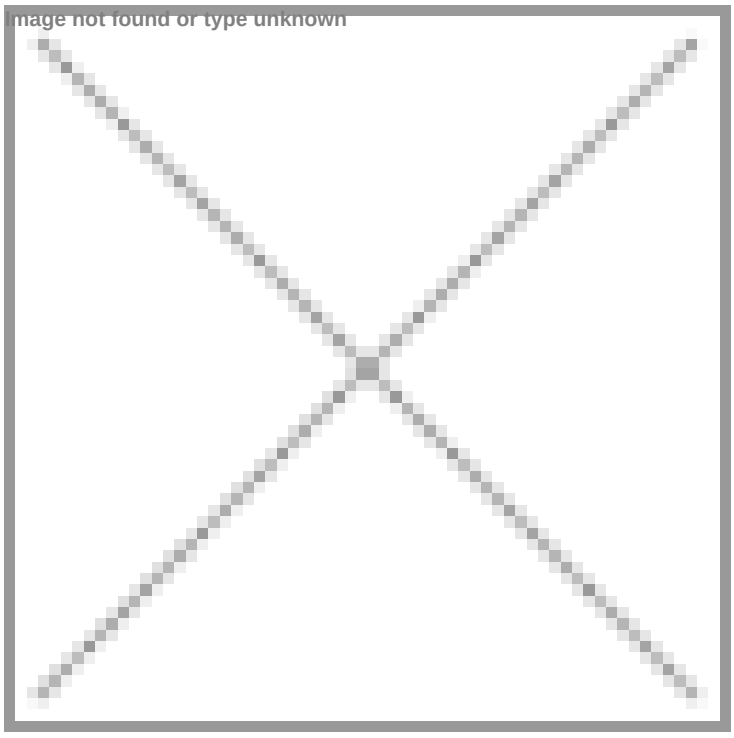
The bioindustrial and biopharma segment have emerged as the two key sectors contributing majorly (82 per cent)to India's bioeconomy which stands at $165.7 billion in 2024. The development of new drugs, vaccines, cell therapies by Indian companies are further strengthening these segments, thereby enhancing the innovation potential of our country. But these innovations require a strong domestic biosupplier ecosystem which is currently dominated by foreign players. However, with the advent of new technologies such as artificial intelligence, generative AI, automation etc, can we expect self-reliance within the domestic biosupplier sector anytime soon? Let's find out.



India has emerged as a key player in the global biopharmaceutical industry, and with the rapid expansion of biologics and biosimilars, the role of domestic biosuppliers has never been more crucial. Also, with a funding support of Rs 1500 crore under the Biotechnology Research Innovation and Entrepreneurship Development (Bio-RIDE) scheme by the government, for promoting high performance biomanufacturing and biofoundry support to the industry, the call for reducing the dependence on imported research equipment, consumables and raw materials is getting strongly established.

According to the India Bioeconomy Report 2025, developed by the Association of Biotechnology Led Enterprises (ABLE), the bioindustrial segment, representing nearly half of the bioeconomy valued at $165.7 billion, stands at $78.2 billion. Its dominance reflects the growing adoption of bio-based solutions across sectors such as biofuels, chemical, bioplastics and enzymes. Likewise, with a significant 35.2 per cent share, valued at $58.4 billion, the biopharma segment is growing stronger with development of new drugs, vaccines, and therapies by the Indian companies.

In order to reach the bioeconomy target of $300 billion by 2030, or before, all stakeholders must come together to overcome the challenges currently facing the domestic biosupplier sector, namely regulatory compliance, stringent quality standards,

expertise, and policy support. While efforts are being made by the local players to overcome these challenges, the key probably lies in the implementation of emerging new technologies such as artificial intelligence (AI), generative AI, automation etc.

Suggesting a few solutions to these existing challenges, **Martin Wilfried Pichler, Chief Executive Officer, Zeta India** said, “Meeting stringent regulatory requirements is crucial and can be time-consuming and costly. However, early and continuous engagement with regulatory bodies can ensure compliance. Implementing robust quality management systems and using advanced analytics to monitor compliance can also be beneficial. Also, high initial costs for new technologies and the risk of financial loss if the technology fails to deliver expected results can pose a big challenge. But conducting detailed cost-benefit analyses and phased implementation can help manage costs. Exploring funding opportunities and partnerships can also mitigate financial risks.”

Relying positively on new technologies, Thane-based biosupplier PharmNXT Biotech has emerged as a key player in the domestic market leveraging advanced automation across critical stages of bioprocessing, including design, prototyping, and scalable production.

“The rise of next-generation therapies, including mRNA, cell and gene therapies, and Antibody-Drug Conjugates (ADCs), will require more sophisticated containment and processing solutions. However, the industry faces significant hurdles in achieving economies of scale, primarily due to regulatory complexities and the dominance of larger global players. The key to overcoming these challenges lies in streamlining regulatory frameworks, subsidising equipment manufacturing, and implementing equitable procurement policies. Also, automated design and prototyping can enable precision engineering, ensuring that products meet the highest safety and operational standards. Automation extended to manufacturing, thereby reducing production costs by 35-40 per cent while maintaining global quality benchmarks is the need of the hour. We are focusing on self-sufficiency in consumables and critical raw materials to provide just-in-time solutions, reducing reliance on imported materials with long lead times”, said **Ankush Kapoor, Co-founder and Chief Executive Officer, PharmNXT Biotech**.

Another key player establishing itself in the domestic biosupplier market is Chennai-based VFL Sciences. The company has recently developed and launched a range of bioreactors and fermenters for the biopharma industry, with a particular focus on biomanufacturing. With new offerings in the pipeline this year and beyond, VFL Sciences is building products of global standards, and with new technologies.

“The overall biosupplier market is growing very well, however the competition is very intense. Opportunities around Cell and Gene Therapy (CGT) as well as synthetic biology are increasing. Government spending on capital instruments is muted, however, we expect that to grow faster in the coming years. The government procurement through GeM (Government e market) is a challenge especially for startups and small companies. Scientific instrument purchase is more complicated and doing this through a system of GeM is cumbersome for scientists as well as companies. We hope to be a better alternative to the leading global brands. Our team of engineers and scientists are working to understand the needs of the customers better and offer products that are made with the concept of affordable excellence”, said **V Sankaranarayanan, Managing Director, VFL Sciences**.

Speaking about how deployment of new technologies can uplift the local biosupplier sector, he further adds, “Artificial intelligence is being tried and used by different biosuppliers. Since several of the bio instruments are made for repeated use of the same protocols, applying GenAI will be very useful to automate the analysis. We expect more of this to come in major analytical and life sciences instruments.”

Ahmedabad-based supplier Shree Biocare is another player at the forefront of technological advancements, developing and installing large-scale automatic media preparation and dispensing systems (bioreactors) and fermentors for the life sciences industry. Likewise, OmniBrx Biotechnologies, also based in Ahmedabad, has designed single-use bioreactors for vaccines, gene therapies, and biologics production.

Attending to the growing use of new technologies, Mumbai-based HiMedia Laboratories, one of the oldest players of the Indian biosuppliers sector, has recently opened a state-of-the-art Centre of Excellence (CoE) for 3D Cell Culture Laboratory, where cutting-edge technologies and pioneering research is converging to shape the future of cell culture methodologies. This facility is also serving as a catalyst for developing novel solutions and driving breakthroughs in 3D cell culture and bioprinting technologies.

On the global front, biosuppliers have been implementing new technologies to their products as fast as possible. For instance, Thermo Fisher has recently launched Krios 5 Cryo-Transmission Electron Microscope (TEM) with enhanced optics and AI-enabled automation, while Agilent has acquired US-based startup Sigsense Technologies, which uses AI and power monitoring to help optimise lab operations. Likewise, Eppendorf SE and DataHow AG have announced a strategic collaboration to advance bioprocess data management using AI; while Qiagen has launched an AI-extension of Ingenuity

Pathway Analysis for automatic interpretation of biological data.

Although the use of technology can prove to be beneficial for the domestic biosupplier industry to strengthen its presence, and come at par with the global competitors, it will require a skilled workforce for efficient handling. This will in turn require comprehensive training programmes to be organised by the local players, with support from other stakeholders, to help bridge the knowledge gap.

“Vision towards becoming the global biopharma powerhouse demands close collaboration between all members of the ecosystem i.e. organisations focusing on research and manufacturing, biosuppliers, academia, and policymakers. While the biosupplier market is currently dominated by global players, a stronger nationwide presence of high-quality domestic suppliers will be essential to drive innovation in emerging biopharma technologies”, concludes **Dr Cyrus Karkaria, President, Biotechnology – Lupin**.

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