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Strategies for Reaching a $300 Billion Indian Bioeconomy by 2030

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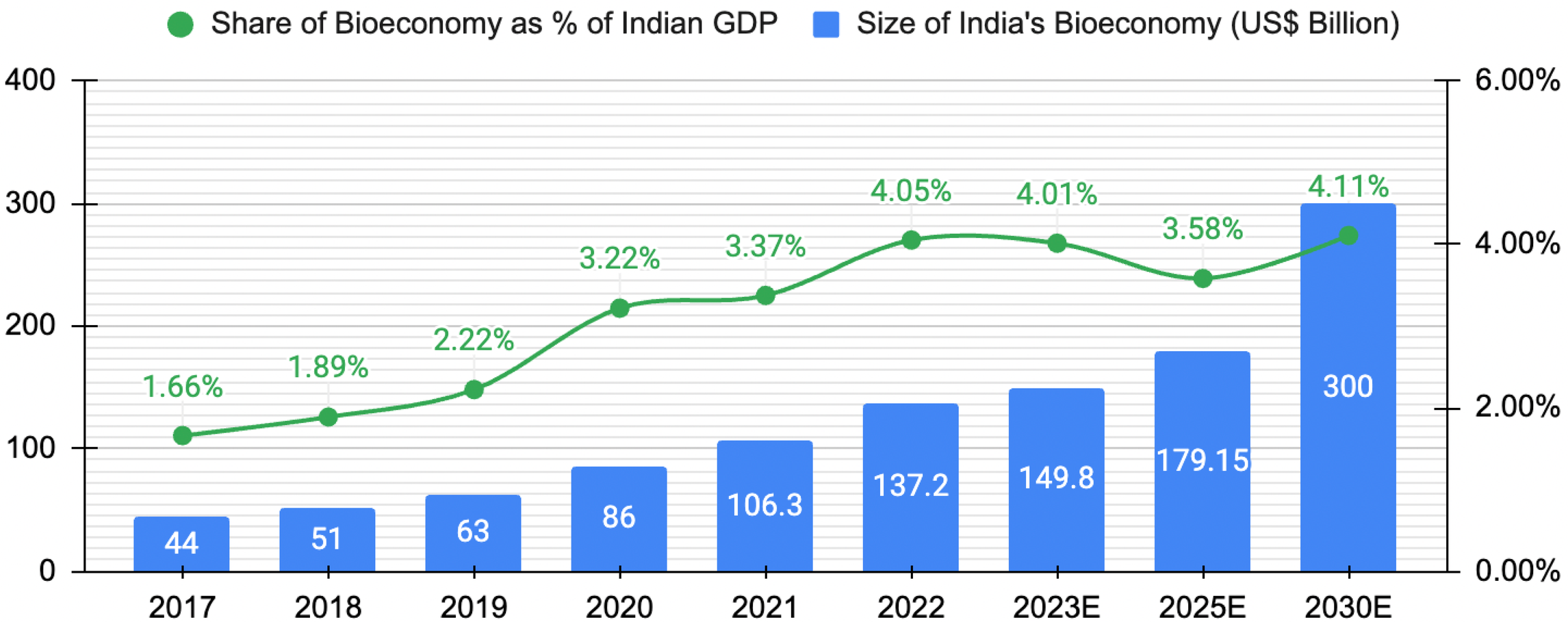
Why Bioeconomy Matters?

Bioeconomy stands for the “Technology-enabled development of value-added products/services from biological resources to drive the economy (increase GDP + employment); enable health security and drive sustainable development.”

Driving the bioeconomy is critical to India’s goal of becoming a developed nation by 2047 while maintaining its sustainable development commitments. It offers an opportunity for India to build on its existing strengths—human capital and biodiversity—to ramp up the pace of economic growth.

The emergence of new technologies and current geopolitical narratives of friend-shoring creates opportunities for India to build new technological advantages and leverage international relations to foster biotechnology cooperation and leapfrog bioeconomic growth.

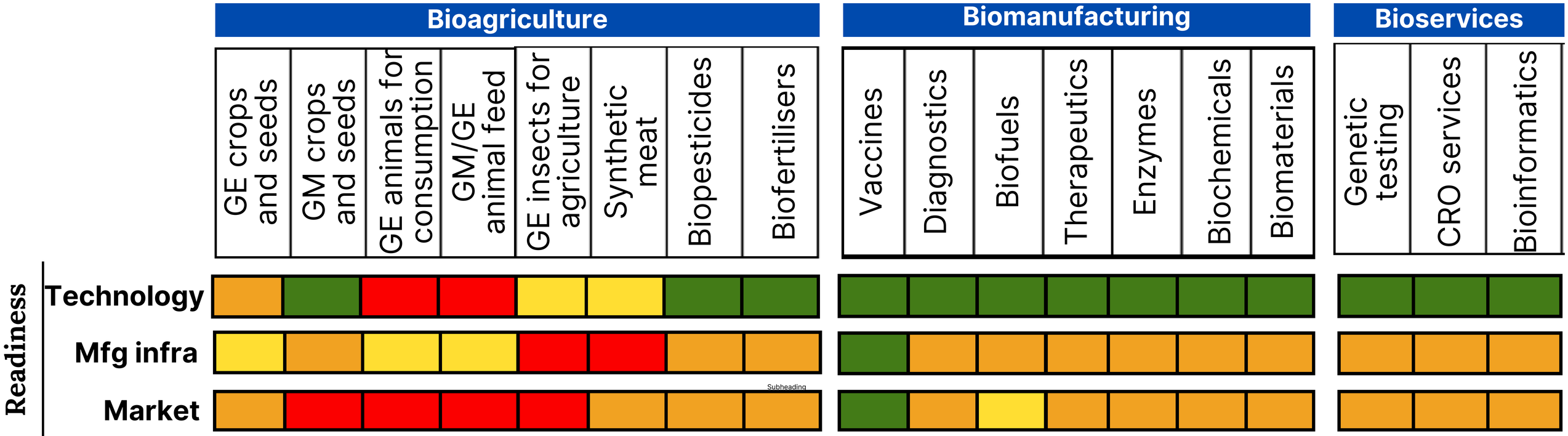
Current State of the Bioeconomy



India’s bioeconomy has been increasing its share of the national GDP. COVID-19 provided a fillip to this share. However, COVID-19 was a black swan event and its waning influence is reflected in the reduced bioeconomy growth rate. India’s future trajectory should account for the COVID-19 aberration and provide roadmaps that recommend substitutes.

This report recommends 15 steps to fulfil India’s aim of achieving $300 billion bioeconomy by 2030.

Current landscape of the Indian Bioeconomy



Highlights

Areas of Strength

- Research in biomanufacturing
- Overall land, water and unskilled labour availability
- Ability to manufacture affordably

Areas of Improvement

- Market access in emerging tech is heavily regulated
- Appropriately skilled labour
- Overall R&D spending

Levers of Improvement

- Funding
- Semi-skilled and skilled labour
- Infrastructure
- Market

Technology	No academic research	Only academic research	Proof of Concept/Protoyping	Commercialisation
Manufacturing	No infrastructure	Infra from other applications	Few institutions with infra	Entrenched infra
Market	Govt. restriction	Significant govt intervention	Domestic market penetration	Intl. market penetration

Key Issues of the Current Landscape

Key Levers	Current Constraints	Intended Outcomes
1 **Funding**	India spends only 0.6% GDP on R&D, majority of which is government-funded. PhD students pursue their further career abroad. Undergrads are not exposed to new technologies	India should spend 3% GDP on R&D annually till 2047, driven by private sector An appropriately skilled workforce across the bioeconomy value chain - manufacturing, research, etc.
2 **Labour**		
3 **Infrastructure**	Infrastructure is limited and distributed across the country	Research infrastructure across the country; mfg infrastructure clustered
4 **Market**	There are barriers to domestic & international markets	Preferred or advance purchase agreements, clear approval policies for market entry

Overview of Recommendations

Streamline Governance

- Segment biotechnology sector
- Set up Biotechnology Authority
- Formulate a bioeconomy roadmap

Raise R &D funding

- Extend Carbon Credit Policy
- Matching state grants
- Matching private sector grants

Build capacity

- Accreditate vocational programmes
- Build manufacturing clusters
- Build research hubs for emerging technologies

Strengthen IPR

- Specialised judiciary cadre
- Set up Quad patent court
- Expand technology transfer offices

Foreign Engagement

- Nucleate a VC ecosystem
- Negotiate preferred purchase agreements
- Offer shared manufacturing capacity

Streamline Governance

Issues	Biotechnology industry is at differing levels of maturation	Governance of biotech products is distributed	Policies that impact biotechnology are spread across various ministries
Solution	Segment biotech industry based on extent of domestic innovation & maturity of market	Establish a single Biotechnology Regulatory Authority of India	Create an inter-ministerial bioeconomy roadmap
Outcomes	Focus resources on priority areas for better outcomes	Holistic policy to promote biotechnology product	Inter-ministerial coordination for achieving common national goals

Raise R & D funding

Issues	Share of private sector investment in research has to double	State government funding for research is low.	Share of private sector investment in research has to double
Solution	Extend the Carbon Credit Trading Scheme 2023 to finance climate research	Union govt to match state grants for projects of state and national benefit	Matching grants or other incentives to private companies to set up infra in Tier II/III cities
Outcomes	Non-biotech industry will fund research in biotechnology.	Better utilisation of states' strengths in bioresources and talent.	Incentivise private investment in building capacity in TierII/III regions

Build Capacity

Issues	Lack of appropriately skilled workforce for biotech jobs	Biomfg. has to be at a sufficient scale	Foreign dependence for basic needs of emerging tech
Solution	Accreditate vocational training programmes for bioprocessing	Union govt to match state grants for projects of state and national benefit	Build research hubs with core facilities such as gene synthesis, sequencing, etc.
Outcomes	Availability of appropariately skilled labour	Better utilisation of states' strengths in bioresources and talent.	Incentivise private investment in building capacity in Tier II/III regions

Strengthen IPR

Issues	Lack of appropriately skilled workforce for biotech jobs	Low international confidence in India's IPR system.	Low capacity to facilitate technology transfers between academia & industry
Solution	Specialised IPR cadre within the judiciary	Set up a Quad patent court within India partnerting with US, Australia and Japan	Expand technology transfer offices in each state & major biotech hubs
Outcomes	Built a trained capacity in India to jurisdicate on IPR cases faster	Built a trained capacity in India to jurisdicate on IPR cases faster	Expedite commercialisation of technologies

Foreign Engagement

Issues	Domestic VC system lacks capacity toevaluate biotech risk	Current competitors create barriers to market entry	Setting up manufacturing hubs is cost-intensive
Solution	Nucleate a VC ecosystem by creating a fund alongwith domestic & foreign VCs	Negotiate preferred purchase agreements for India-produced products	Partner with other countries to set up shared biomanufacturing hubs
Outcomes	Build domestic VC capacity and attract foreign funding for biotech	Guaranteed demand will reduce business risk and cost	Increased domestic manufacturing capacity and access to foreign IP

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