

Smart Protein Equipment Manufacturing Hub Initiative

As the world acknowledges the relevance of smart proteins, globally known as alternative proteins, which include plant-based, fermentation-derived, and cultivated proteins, in addressing challenges such as climate change, food insecurity, antibiotic resistance, and pandemic risk, India is uniquely positioned to become a global hub for smart protein manufacturing. Recognising this potential, on August 24, 2024, the Indian Union Cabinet, chaired by Prime Minister Narendra Modi, approved the BioE3 policy with smart proteins as one of the key thematic sectors. The policy not only focuses on increased R&D and innovation in the sector but also underscores the need for industry-academia collaboration and the techno-commercialisation of research.

One of the key bottlenecks in mainstreaming the plant-based smart protein value chain is the high cost of equipment such as extruders, separators, and drying systems, which poses a significant barrier to the growth of the smart protein sector globally. By leveraging India's abundant natural resources (e.g., steel, aluminium, copper), skilled workforce, MSMEs, and supportive government policies, we can seize this opportunity to lead the transformation of this emerging sector.

This project aims to explore the strategies that will position India as a leader in manufacturing smart protein processing equipment, thereby reducing costs and supporting the sector's growth at both domestic and international levels.

Main project objectives

1. **Identify current manufacturing capabilities:** Assess India's current manufacturing capabilities for key plant-based protein processing equipment, focusing on extruders, separators, and drying systems.
2. **Bridge capability gaps:** Identify gaps in existing capabilities and explore options for local production of cost-effective equipment, hence reducing dependency on expensive imports.
3. **Assessment of stakeholder interest:** Engage with local and global equipment manufacturers to determine their interest in expanding their operations in India, especially through collaborations and joint ventures.
4. **Develop strategic recommendations:** Make actionable recommendations to the government and corporate stakeholders regarding policy support, infrastructural requirements, and viable partnerships to foster local manufacturing.

Scope and focus of the project

The project will prioritise the development and improvement of key processing equipment specifically for plant-based protein ingredients and products, with a focus on extruders, separators, and drying systems, which are crucial for the sector.

1. **Extruders:** Essential for texturising plant proteins to mimic animal protein textures. The goal is to reduce the cost of twin-screw and high-moisture extruders, which are currently expensive and have limited local manufacturers.
2. **Separators:** Includes filters, air classifiers, decanters, and centrifuges for purifying and isolating protein extracts. The aim is to localise the production of components currently imported, such as filtration membranes.
3. **Drying systems:** Spray dryers, flash dryers, fluidised bed dryers, and freeze dryers are critical for making powdered protein isolates and concentrates, extending shelf life, and improving the convenience of storage and transport.

Other food processing machinery, such as reactors, mixers, blenders, and packaging machines, are not included in the scope due to their existing local manufacturing presence.

Why this matters

1. **Reducing entry barriers:** The high cost of essential processing equipment remains a major challenge for the growth of the smart protein sector. This initiative will help democratise access to the sector by significantly reducing the costs of extruders, separators, and drying systems, which will be necessary for both new and existing companies.
2. **Global impact and accessibility:** The availability of cost-effective processing equipment on a global scale, especially in developing and least developed countries, will accelerate the growth of the alternative protein sector globally. By enabling more countries to adopt these technologies, we can collectively address food security and sustainability challenges.
3. **Strengthening supply chains:** Affordable and accessible equipment will drive up demand for plant-based protein ingredients and products, boosting the entire supply chain from farmers to processors. This will help bridge the price gap between smart protein and animal-based products and also enhance supply chain resilience and create opportunities across different levels of the agricultural and manufacturing ecosystems.
4. **Enhanced food security and nutrition:** By making smart proteins more affordable and accessible, the project will contribute to improving global food security and providing sustainable, nutritious food options to a larger population. This will help address the nutritional needs of growing populations, particularly in regions that face challenges with traditional sources of protein.
5. **Economic growth and job creation:** Establishing a local manufacturing hub for smart

protein processing equipment will create new job opportunities in both the manufacturing and smart protein sectors. This initiative will contribute to economic growth and help build specialised skills and expertise in an emerging and impactful field.

Approach

We will select an external partner through a Request for Proposal (RFP) to conduct a detailed study on India's potential as a global manufacturing hub for smart protein processing equipment. This partner will assess current capabilities, identify gaps, and provide strategic insights for local manufacturing. We will use the study's findings to create a clear roadmap to improve India's manufacturing capabilities. The study will examine technology transfer opportunities, identify potential collaborations between local industries and international manufacturers, and outline necessary infrastructure improvements and policy support. The goal is to chart a plan that addresses key challenges, promotes industry growth, and attracts investment in the smart protein sector.

For additional details, you can reach out to Aakashraj Bhople, Corporate Engagement Associate, GFI India, at indiacollab@gfi.org