



INCUBATION SUPPORT FOR A THRIVING SMART PROTEIN ECOSYSTEM





INTRODUCTION

With more than 1,12,718 DPIIT-recognized startups operating across 763 districts, India is home to the [third-largest startup ecosystem](#) in the world. Unlike the corporate sector, the startup boom in India invited many young entrepreneurs who may lack industrial experience but are working on innovative solutions with the potential to disrupt existing markets. While startup founders have been at the forefront of this business boom, there are various other academic organisations, state and non-state actors, and industrial bodies that have laid the foundation for this ecosystem through establishing infrastructure, supportive policies, fit-for-purpose funding routes, or market access points. An important lever that has emerged as a result of these interactions—is a robust incubation ecosystem.

While there are many categories of [incubators](#) (business incubator, bio incubator, etc.), they all generally offer some combination of a co-working space, lab and new technological facilities, business services, coaching and mentoring, funding, as well as access to market linkages. Incubators increase the survival rate of startups by providing them with these services and resources at an early stage when they either cannot afford to procure them at market cost or are unable to identify or collaborate with the right partners. Beyond the idea stage, some incubator programs also support startups in navigating the dreaded [valley of death](#)—the early phase of new ventures when operations have begun, but no sufficient revenue has been generated. By providing business and technical mentorship, these incubators support startups through the initial phases to commercialise their solution and find a product market fit.

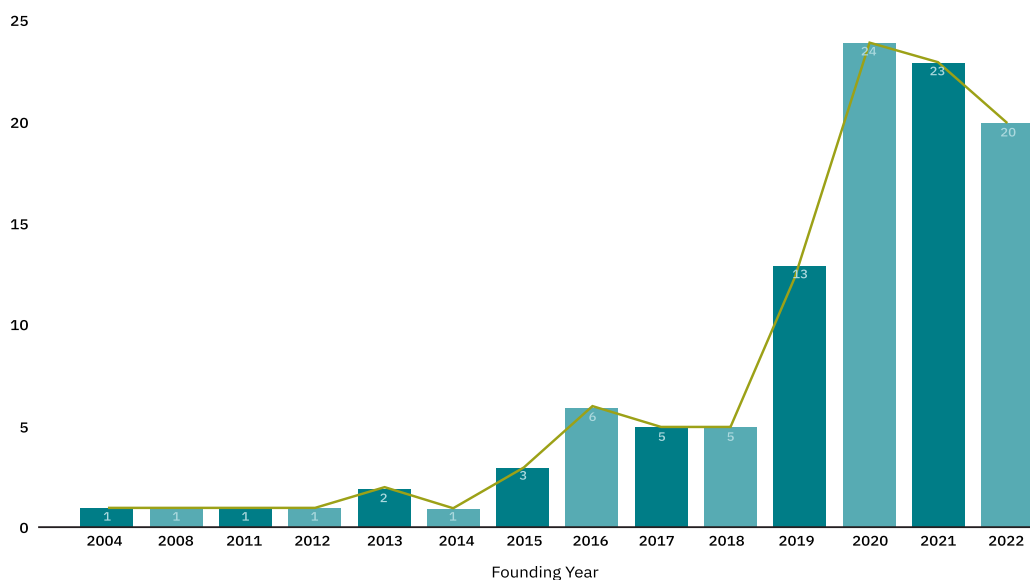
These resources become even more essential in sectors where entrepreneurs are working on cutting-edge technologies that don't have a traditional path to market and require innovation across the value chain. One such example is smart protein.

¹Department for Promotion of Industry and Internal Trade

Need for incubation in the smart protein landscape

Smart protein, globally known as alternative protein, is a rapidly growing sector focused on creating innovative food alternatives to traditional animal-derived products like meat, eggs, dairy, and seafood. This sector, encompassing plant-based, cultivated, and fermentation-derived options, is paving the way for food solutions with better outcomes for food security, public health, and planetary health. As per our [State of the Industry Report for smart protein](#), the category in India is estimated to be around ₹350 crore, with more than 113 startups actively working on plant-based, fermented, and cultivated proteins. These entrepreneurs are working on a range of solutions: creating plant-based designer fats, scaffolds for cultivated meat, and converting Co2 to single-cell proteins for human nutrition.

Distribution of Smart Protein Startups (2022)



Source: GFI India's State of the Industry Report

With startups spread across 23+ cities, they need access to ecosystem enablers in their local innovation environment that can help them tackle the unique challenges of a nascent sector like smart protein. However, currently, there is no specific data to assess the current state of incubation support available to these startups at different stages of their development (idea stage, pre-market, commercialisation, scale-up). To bridge this data gap, GFI India, in collaboration with IKP Knowledge Park, a 200-acre science and technology park, hosted two virtual consultation sessions with entrepreneurs and expert researchers working on plant-based, cultivated, and fermented protein. This brief summarises the principal findings and recommendations for private and public players looking to incubate and support smart protein innovators.



Session	Focus Area	Specialisation
Consultation Session 1	Plant-based protein	Plant-based dairy, ingredients (protein, fats), plant-based meat, plant-based pet food, plant-based egg, and plant-based seafood
Consultation Session 2	Cultivated and fermentation-derived protein	Precision fermentation, animal-free dairy proteins, scaffolding, cell lines, and media formulations

Table 1: Entrepreneurs and subject matter experts attending the two sessions focused on different areas of research and innovation within their respective smart protein verticals (plant-based vs cultivated and fermented protein)



Findings & recommendations

During the consultation sessions, entrepreneurs shared their experience of applying for incubation programs, the services and support they received, and gaps in the current infrastructure that impeded their growth or delayed their commercialisation. The subject-matter experts also addressed some of the challenges and provided recommendations to improve the current systems. The key findings and recommendations discussed during the session are summarised below:

I. Challenge: Unavailability of suitable equipment & infrastructure for R&D

With many incubators primarily focusing on the conventional food processing sector, plant-based startups indicated that their equipment provisions can often be outdated or unsuitable for developing innovative smart protein products. While startups highlighted the need for a centralised facility equipped with advanced developmental instruments, industry experts indicate that it may not be feasible to house all necessary equipment in a single institution. To navigate this challenge, startups could benefit from consulting with an R&D expert who can help them identify the necessary equipment and tests for their specific R&D needs before approaching an incubator.

For fermentation and cultivated protein R&D, entrepreneurs require fermentors of varying sizes at different stages. However, owning and maintaining such equipment, especially in the early stages of development, is a CAPEX-heavy and time-consuming investment. Additionally, the lack of suitable downstream processing equipment in Indian incubators, which are either over-engineered for other industries or under-engineered for the smart protein sector, further complicates the scenario. Even when these biotech startups are able to identify incubators with the necessary facilities, they face other challenges, such as limited availability of specialised equipment, long waiting intervals due to prolonged maintenance periods, and stringent entry requirements. The scarcity of pilot-scale trial equipment and the difficulty in consolidating resources have led some smart protein startups to consider establishing their R&D bases in more equipped ecosystems within the Asia-Pacific region, like Singapore.



On a brighter note, startups continue to recognise the burgeoning potential of India's ecosystem, particularly its talent pool and research opportunities. The growing provision of basic infrastructural amenities like co-working spaces alone can significantly alleviate the administrative burden that startups bear, enabling them to focus more on product innovation.

The GFI India team has compiled a [list of equipment](#) (with details about their usage) required by startups working on solutions across the plant-based, fermentation, and cultivated protein verticals. This is not an exhaustive list and only details the most common equipment required for R&D globally.

Recommendation: Building a robust collaboration framework across incubators

Within India's burgeoning smart protein sector, a notable impediment is the limited collaboration and support between different incubators. Often, equipment and infrastructure that is pivotal for advancing innovation across the smart protein value chain is scattered across various incubators, thereby limiting access to the respective host incubator's startups alone. This fragmentation hinders cross-ecosystem collaboration and stifles product innovation. To tackle this challenge, startups indicated the need for a dedicated facility for early-stage research and testing of smart protein innovations. Furthermore, they indicated the need for a cohesive framework to foster partnerships between incubators, coupled with a centralised database cataloguing laboratories capable of providing affordable testing services. Such a framework, with programs to leverage the business expertise of business incubators and the technical prowess and networks of research incubators, could create a more integrated incubation ecosystem. Incubators that offer streamlined access to diverse resources, accelerate innovation through knowledge sharing, and reduce duplication of efforts in the ecosystem are also more likely to become trailblazers in the ecosystem.



II. Challenge: Limited accessibility to services for securing patents & intellectual property rights

The significance of securing intellectual property (IP) rights and filing patents is paramount for startups, especially for fundraising and establishing a unique market position. Despite existing policies under Startup India that offer subsidised rates and access to IP lawyers, startups face challenges in finding and accessing these resources. Incubators could play a crucial role in helping startups access these lawyers and train them to establish productive relationships with service providers, thereby enhancing their ability to secure and manage their intellectual property.

Recommendation: Support for navigating the regulatory environment

[Evidence](#) indicates that startups that receive strong regulatory support have a higher success rate of commercialisation, building export-import pathways, and dealing with regulatory volatility both in domestic and international markets. Incubators can assist startups in comprehending and fulfilling their legal obligations, obtaining the requisite licenses, and understanding the regulatory pathway to market, particularly in complex verticals like cultivated meat or precision and biomass fermentation. This role is akin to that of a technology commercialisation office. Establishing a forum consisting of regulators and ex-regulators with expertise in the food and biotech domain would not only improve startups' understanding of the dynamic regulatory landscape but also potentially inform policy decisions. One example is IKP's Global Regulatory Forum, which addresses the regulatory challenges of biotech and healthcare startups. Adopting the model of this body, a similar forum can be created for smart protein startups.

III. Challenge: Limited mentorship from relevant subject matter experts

The nascent nature of the smart protein sector in India, particularly in domains like cultivated meat and precision fermentation, underscores the necessity for specialised mentorship. Startups require guidance on equipment usage and ingredient sourcing, particularly during the critical early development stages. In the absence of a fully scaled, commercialised business model in these areas, incubators must provide industry-based expertise rather than solely academic insights. By developing programs



that invite experts from more mature markets to translate research and innovation, incubators can also facilitate the entry of new technologies and solutions into the Indian ecosystem. This approach would empower founders to make well-informed, long-term operations and financial planning decisions.

Recommendation: Potential to build programs to train young entrepreneurs

The rapid expansion of the entrepreneurial ecosystem has led to an influx of young entrepreneurs working on cutting-edge technologies that can create a sustainable food system. There is a growing need to develop entrepreneur-in-residence (EiR) programs specifically tailored to support these budding innovators in the smart protein sector. Such programs would nurture entrepreneurial skills and also provide young founders with the unique insights, tools, and networks required to thrive in this novel industry. This would foster more collaborations, partnerships, and resource sharing that allow young entrepreneurs to stay abreast of rapidly evolving industry trends and fit their solutions across a technology stack. On the other hand, this would allow incubators, to advance a steady group of innovators from the EiR program to their incubation program and attract a diversified portfolio, thereby increasing their resilience to market changes.

IV. Challenge: Limited early-stage capital for smart protein startups

Entrepreneurs can only leverage resources, infrastructure, and mentorship to their full potential if they have an adequate capital runway to support their operations and R&D efforts. While plant-based brands require capital for multiple iterations of innovative product formulation and ideating a GTM strategy for a developing market, startups working on fermentation-derived and cultivated protein incur high front-loaded costs in procuring equipment and running trials for creating a proof-of-concept. To meet these capital needs, entrepreneurs are currently heavily dependent on private capital from venture capitalists and angel investors who seek high-value creation in short timelines. This indicates a clear need for educating young entrepreneurs on fundraising mechanisms and supporting them in accessing non-dilutive capital sources like public R&D grants. In India, many registered incubators are official partners of the [Startup India Seed Fund Scheme](#) and play a key role in identifying scalable solutions and disseminating public seed capital. As these incubators start supporting more smart



protein companies, they need to address this gap in fit-for-purpose funding by working closely with public and private entities and creating smart protein funding calls that can support them in moving from early adoption to mainstream scale.

Recommendation: Potential to learn from allied sectors

The smart protein sector can draw valuable lessons from allied industries such as biotechnology, climate technology, food technology, and healthcare. Sector-agnostic incubators can develop networking, peer support, and research collaboration initiatives where incubatees share their knowledge and secure new partnerships from across the value chain. For example, startups working on fermentation and cultivated protein can learn from biotech startups how to optimize research and development processes, characterisation, analysis, extraction, intellectual property management, or even capacity building. Similarly, a plant-based brand could partner with a food delivery provider to use the latter's cold chain logistics solution to tackle its cross-city distribution challenges. The key is to remember that many pathways for scaling the smart protein sector will come from scaling and developing new solutions across other sectors. Such cross-sector learning could significantly enhance the efficiency and effectiveness of incubation programs in the smart protein sector, propelling it toward greater innovation and success.



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Since our establishment in 2017, GFI India has served as the central thought leader and convening body in the space of plant-based, cultivated, and fermentation-based meat, eggs, and dairy that are collectively known as the alternative protein or smart protein sector.

With unique insight across the scientific, policy, industry, and investment landscapes, we are using the power of food innovation and markets to accelerate the transition of the world's food system toward smart proteins. In building the sector from the ground up in India, we're aiming to establish a model for its growth all across the developing world. The Good Food Institute India (GFI India) is part of an international network of nonprofits with partners in Brazil, Israel, U.S., Europe, and the Asia Pacific, on a mission to build a healthy, sustainable, and just global food system.