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COMMERCIALIZATION OF AGRICULTURAL TECHNOLOGIES: INNOVATIONS IN BUSINESS INCUBATION AND START-UPS

Though the Indian National Agricultural Research System has initiated several measures to support commercialisation of agricultural technologies, a lot more needs to be done to strengthen these efforts. In this blog, Manoj Samuel, George Ninan and CN Ravishanker argue for a new framework to encourage start-up companies in agriculture.

Mrs. Omana Muralidharan was a homemaker at Ernakulam district of Kerala. One of the extension programs conducted by the ICAR-Central Institute of Fisheries Technology (CIFT), Kochi, changed her destiny. Many new fish processing and packaging technologies were discussed during the program. Her attention developed into interest and furthered her desire to start up a small business enterprise with CIFT technologies.

Box 1: Prawnoes – The Extruded Snack Products

ICAR-CIFT's technology for extruded snack food from fish was taken by a woman entrepreneur, Mrs. Omana Muraleedharan, Charis Food Products, Aroor, Kerala.

Before registering as an Incubatee at ZTM-BPD Unit of ICAR-Central Institute of Fisheries Technology (CIFT), Mrs Omana Muraleedharan was running a small-scale metal industry named Amruta Metal Works. She approached ICAR-CIFT with the idea to develop the extruded snack food flavoured with prawn. A brand named 'Prawnoes' was created and registered for trademark protection by ZTM-BPD Unit.

CIFT developed and standardized three varieties of Fish Kure for the Incubatee, 'Spicy Shrimp', 'Shrimp n Onion' and 'Prawn Seasoning'. The BPD Unit also helped the entrepreneur to carry out feasibility studies, prepare Business plan and DPR (Detailed Project Report) and helped her in mobilising seed funding from Canara Bank to start her own production facility in the Industrial area at Aroor, Kerala. The production facility was designed and machines were sourced through the BPD Unit. Some of the machines were indigenously designed and manufactured as per the suggestions from ICAR-CIFT. CIFT gave her technical guidance in developing the product, standardization of process parameters, testing, packaging solutions, ideas for branding, assistance in trademark filing and setting up their own production unit at Aroor.

The unit was inaugurated on 28 June 2014. Presently Prawnoes (www.prawnoes.com) is marketed in seven flavours and the produce is sold in four districts in Kerala. Mrs Omana Muraleedharan received the best woman entrepreneur award from the Government of Kerala State Prawnoes received excellent product reviews during its test marketing period and Mrs. Omana is planning to add more snack foods to her product range. With the support of all government institutions like the District Industries Centre (DIC), Ministry of Microm Small and Medium Enterprises (MSME), Banks and CIFT, she is now promoting a healthy snack food brand with a campaign "Save Children, Eat healthy snack".

However, the challenges were (a) no finances, (b) competition from big firms, (c) no infrastructure, (d) no machineries, (e) no skilled manpower, and (f) no trainings. At that juncture, the Agri-Business Incubator (ABI) attached to the CIFT has come to her rescue. Presently, she is one of the most successful women entrepreneurs of Kerala with the brand of "PRAWANOES" -- the extruded snack products in different flavours (Box 1).

Business Incubation in Agriculture

Agri-Business Incubators (ABI) open new entry points in the agricultural value chains, which in turn keep in accessing new markets (Box 2). There is no single "right way" to perform agribusiness incubation. Rather the work of agribusiness incubation depends on the state of development of the agribusiness ecosystem and changes over time as that ecosystem matures and develops. In its earliest phases, incubators demonstrate the viability of new business models and look to

create and capture additional value from primary agricultural products.

In underdeveloped agricultural economies, incubators help by strengthening and facilitating linkages between enterprises and new commercial opportunities. They open new windows on technologies appropriate to agribusiness enterprises and help agricultural enterprises discover new, potentially more competitive ways of doing business. In subsequent phases of development, incubators operate as network facilitators by:

- Linking specialized service providers to agribusinesses and
- Linking separate agribusinesses to one another

Finally, in a more advanced state of business development, incubators operate as conduits for the exchange of technology, products, inputs and management methods across national borders.

Box 2: Agri-Business Incubation

The mission of agri-business incubation is improving the well-being of the poor through creation of competitive agri-business enterprises by technology development and commercialization. Agri-Business incubation is defined as a process which focuses on nurturing innovative early-stage enterprises. These enterprises have high growth potential to become competitive agribusinesses by serving, adding value or linking to farm producers.

The major objectives of agri-business incubation initiatives are as follows:

- Foster the innovation through creation, development of agri-businesses to benefit the farming community
- Facilitate agro-technology commercialization by promoting and supporting agribusiness ventures.
- Promote successful agribusiness ventures in order to benefit the farmers through new markets, products and services

The commercialization including dissemination, transfer and marketing of technology has been evolving as a major pillar that supports the R&D systems. The commercialization process is linked to various activities in the technology management pipeline like protection, valuation, incubation, test marketing, technical and economic feasibility studies, showcasing, licensing and marketing of the technology. Incubation process helps nascent technology to fully evolve into a business product or service which can compete in real world environment. In a globalized economy, technology licensing and transfer of technology are important factors in strategic alliances and international joint ventures in order to maintain a competitive edge in a market economy.

Agri-Business Incubation and Tech Transfer in NARS

The National Agricultural Research System (NARS) in India employs about 4000 researchers in Indian Council of Agricultural Research (ICAR) and almost 15,000 academic faculty members in various State Agricultural Universities (SAUs). In view of changing circumstances and policies, the NARS has initiated steps to strengthen its IP portfolio management and encourage its researchers and academicians to develop and commercialize their innovations for the benefit of farming community. A more pragmatic system for business incubation and promoting start-up companies with respect

to agricultural technologies have evolved in recent times within the National Agricultural Research System (NARS). Generally agricultural technologies are low-cost technologies and entrepreneurs are not much enthusiastic about it, considering the less purchasing power of the target market.

Since the implementation of the Eleventh Five Year Plan (2007-12) of Government of India, the three-tier IP management mechanism has been established in Indian Council of Agricultural Research (ICAR) towards developing an institutional setup for commercialization of agriculture research products/technologies generated from public research institutions.

Accordingly, Institute Technology Management Units (ITMUs) were established in its 95 institutes as a single-window mechanism to showcase the intellectual assets of the institute and pursue matters related to IP management and transfer/commercialization. Five Zonal Technology Management and Business Planning and Development (ZTM&BPD) units were established at the middle-tier, in synergy with the ITMUs, in their respective zones. Twelve new BPD units have been initiated in 2013-14 to promote business incubation and technology commercialization. Subsequently the National Agricultural Innovation Fund (NAIF) has been schematized for the 12th Plan period (2012-17) by the Government of India and establishment Agri-Business Incubation (ABI) Units in 27 Agricultural research institutes and promotion of Grass-roots Innovations are the highlights of the scheme. Under the new initiative, sector wise Zonal Technology Management Centres (ZTMC) coordinate the technology incubation, protection, commercialization

activities. Apart from these, Department of Science & Technology (DST) supported Technology Business Incubators (TBI) are set up in three NARS institutions and incubation and innovation centres are established at different State Agricultural Universities.

Support and services needed by bigger firms and investors for technology transfer as well as for incubation and funding can be addressed through the new flexible business innovation-incubation centres like "Agrinnovate India" and Technology Business Incubator under the NARS itself (Fig. 1). The requirement of incubation support by the bigger firms may also be met by these institutional innovations. Provisions were also made to protect the interest of farming community. The established mechanism helps to answer the questions, which may arise from the society on the righteousness and ethical issues of commercializing the public funded research outputs.

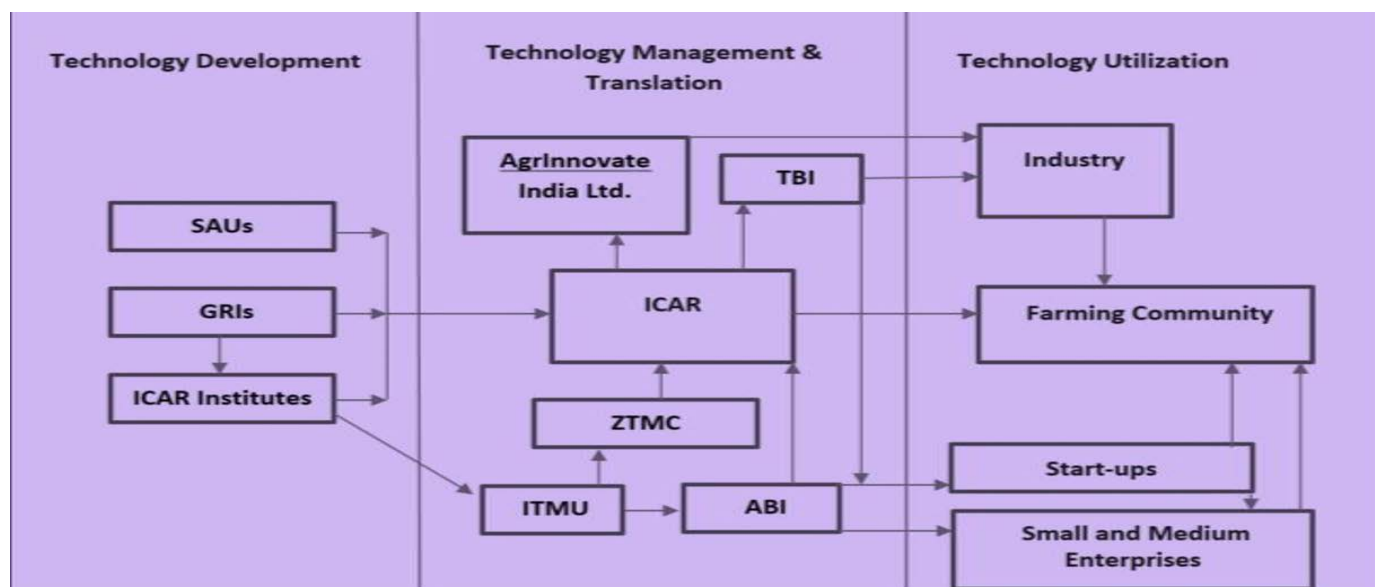


Fig. 1: Institutional framework for Tech transfer and commercialization

The Agribusiness Incubator Program under NARS seeks to provide business consulting services to agriculture-related businesses and helps to develop a strategic business plan. The new initiatives by the Govt. of India as well as ICAR have encouraged start-up companies in agriculture, especially by attracting rural youth to agri-entrepreneurship. Apart from guidance and consultancy services, the new initiatives also assist in making venture capital funds available to the start-ups. The local communities can also be involved in developing business ideas and entities with respect to agriculture.

Need for a New Framework

Though the existing framework works fairly well,

more innovations are required for strengthening agri-Incubation and commercialization capacity of NARS in India in view of rapidly changing market dynamics- both nationally and globally, positively oriented government policies and expanding agri-business avenues. Though there are many agencies, schemes and government departments in the country to act as support mechanisms for IP protection and subsequent commercialization, the benefits are not extended to the needy entrepreneurs, especially in case of small and medium scale agri-businesses. See AESA Blogs: Sivakumar S and Sivaraman I (2014). Fostering entrepreneurship through Agribusiness Incubation: Role of extension professionals. Blog 33. Agricultural Extension in South Asia (<http://www.aesanetwork.org/fostering-entrepreneurship->

through-agribusiness-incubation-role-of-extension-professionals/), Srinivas K (2016). Agribusiness Incubation In India: Ways Forward. Blog 57. Agricultural Extension in South Asia (<http://www.aesanetwork.org/agribusiness-incubation-in-india-ways-forward/>).

Though agribusiness incubators are important to promote entrepreneurship and commercialization of new technologies in agriculture, the incubators are yet to receive sufficient attention and funding in India. Lack of a positive ecosystem to nurture start-ups affects the functioning of agribusiness incubators (Srinivas, 2016).

Hence, an effective umbrella structure should be conceived as a nodal unit at the ICAR level. ICAR coordinated the technology commercialization activities under NARS. The nodal unit ensures the deliverance of governmental schemes and financial grants to the appropriate agri-enterprises and start-ups.

The new institutional and process innovations should focus on the speed and ease of commercializing developed technology and further doing business without much bureaucratic delays. The envisaged system should facilitate open communication and exchange of ideas among academia, research institutions, industry and farmers.

A novel approach is envisaged to encourage

start-up companies in agriculture, especially by attracting rural youth to agri-entrepreneurship. Apart from guidance and consultancy services, the new initiative should also assist in making venture capital funds available to the start-ups. The local communities can also be involved in developing business ideas and entities with respect to agriculture.

The development processes in the suggestive framework (Fig.2) for the Agriculture Business Incubation (ABI) involve scouting of the technology, assessment and the valuation. The technology management services focus on the protection of the developed technologies having a commercial value. The technology generation cycle is the phase where product prototype developed out of the technology innovation undergoes continuous transformation leading into the final product development. The process such as innovation process; technology generation process; and agriculture business incubation are individual entities but complete a cycle of a business. Combining all these processes in a framework, a holistic approach for fostering innovation and incubation eco-system has been envisaged. Through this framework, the role of the individuals or public and private players at various levels and at various places are defined in the process of innovation of various technologies and products.

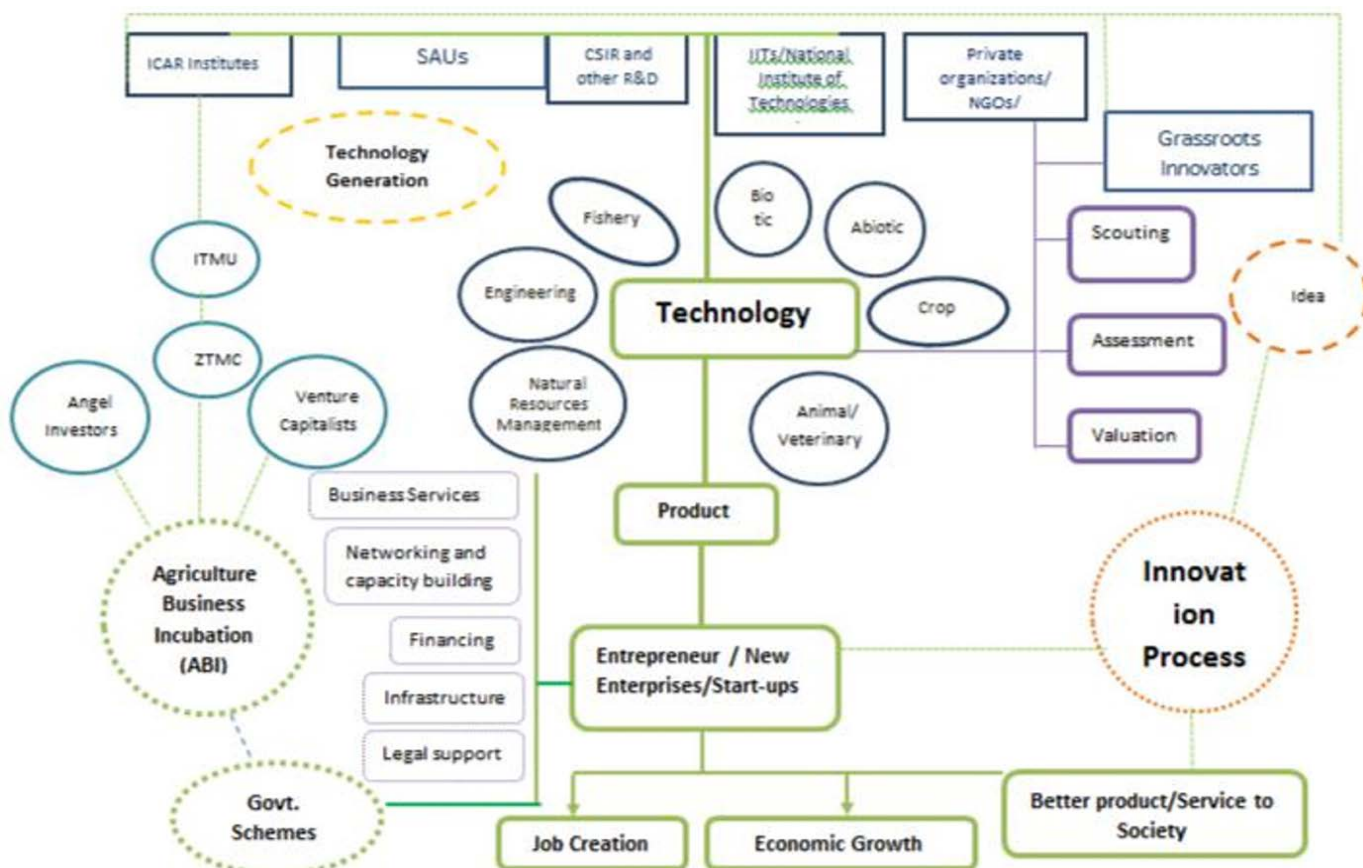


Fig. 2: Conceptualized framework for agri-innovation-incubation process

The nodal centre, which can act as a networking platform of technology managers in SAUs and ICAR institutes in line of a registered society will be helpful in networking relations and exchange of ideas and information related to IP management in agriculture. Further it can be extended by incorporating other areas of scientific organizations, institute of technologies, engineering colleges, law and business schools and traditional universities. Such a platform can be linked to similar organizations in other countries like Association of University Technology Managers (AUTM) in USA in order to explore the possibility of global technology transfer and commercialization. This initiative will also aid in updating with recent trends in IP regime, new changes in IP laws in a national and international perspective. The platform can also be extended to private companies to foster public-private partnerships.

The nodal centre can bridge the gap between research institutes, industry society, and the Government. It can play a proactive role in framing technology transfer and commercialization policy in coordination with Central and State agencies, government, business houses and other players in the industry. Nodal centres can be mooted in all research councils/organizations like CSIR, ICAR, ICMR etc. and which all can be pooled together to form a National level umbrella consortium under Government of India. The Consortia is envisaged to facilitate the convergence and effective deliverance of all schemes with respect to innovation, incubation and commercialization.

Way Forward

Translating research into technologies and then to product and services requires a coordinated and concerted effort by all stakeholders. An effective national-level umbrella structure should be conceived and established which ensures the deliverance of governmental schemes and

financial grants to the appropriate agri-enterprises and start-ups.

A technology transfer protocol for forward integration with the Government machinery, policy makers and other clients and the backward integration with the framers, research institutes, NGOs and other organizations such as IIMs, IITs and business houses, has to be designed with clearly defined channels of communication and data flow.

Partnerships should be developed among the research producers, users, and funders both at the nodal centre and consortia levels. The scope of public-private partnerships in agriculture and biotechnology in the areas of technology development, protection, transfer and commercialization has to be explored.

Though extension professionals could play a very useful role in this endeavour, the field of agribusiness incubation hasn't yet got into the education and training curricula of extension professionals. There is a need to strengthen research on value chain modelling-mapping and analysis, business opportunity identification, financial management tools and techniques, logistics and branding to maximise the role of extension in the agri-incubation process (Sivakumar and Sivaraman, 2014).

Public institutions under various platforms in India such as Department of Science & Technology (DST), Council for Scientific and Industrial Research (CSIR), Department of Bio-technology (DBT), ICAR, Ministry of Micro, Small and Medium Enterprises etc. should make sure effective flow of information, timely consultancy services and speedy delivery mechanisms to the grass-root level agripreneurs. Effective communication, coordination and cooperation among the various nodal centres, umbrella consortium and the industry are inevitable for the successful implementation of the schemes.



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