Agribusiness Incubation Transforming Indian Agriculture

A Business Incubation Approach of NAIP-BPDs in NARS

SM Karuppanchetty, PS Pandey, Jonathan Philroy, Divya Nancy G, Bhubesh Kumar R, Aravazhi S

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International Crops Research Institute for the Semi-Arid Tropics

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2014

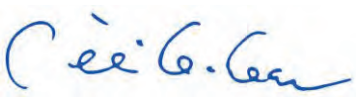
Foreword

Amid the global challenges today, many developing countries have embarked on a growth strategy focused on agricultural revitalization in order to achieve broad economic and societal transformation. Higher farm incomes raise demand for industrial goods, lower food prices, and curb inflation. They encourage broad entrepreneurial activities, diversification into new products, the growth of rural service sectors, the emergence of agro-processing industries, and expansion into new markets. Modernizing the agro-food system can therefore be a strong engine for direct and indirect growth and poverty reduction. To move toward this path, we must view agriculture and allied sectors as a business endeavor, and veer away from the traditional, subsistence mode of doing things.

Entrepreneurship plays a critical role in this development pathway as it creates jobs, drives and shapes innovation and brings in competition, which in turn improves productivity. It thereby acts as a catalyst for economic growth and national competitiveness. By providing a nurturing ecosystem for the growth of entrepreneurship, business incubators are now gaining recognition as a vital link between agriculture and industry and the improvement of economic, social and environmental conditions especially of rural communities.

At ICRISAT, we believe that smallholder farmers should be enabled to access markets and directly benefit from technology-based solutions, if they are to become resilient and resourceful in the sea of challenges facing the sector. Guided by an Inclusive Market-Oriented Development (IMOD) approach in all our Research for Development activities, ICRISAT's Agri-Business Incubation (ABI) Program has been at the forefront of transforming the sector through its initiatives and work in entrepreneurship and promoting agribusiness ventures that focus on helping farmers, women and rural youth. We have used this platform to reach out to more number of beneficiaries by helping setup incubators in different parts of India and Africa. Our partnership with the Indian Council of Agricultural Research (ICAR) has strengthened the agribusiness incubator network in the country and enhanced the results on the ground. With 22 Business Planning & Development (BPD) Units mentored and guided by the ABI Program, tremendous results in terms of both economic and social impact in the short span of four years have been achieved.

We acknowledge that there are many challenges that these incubators will face in the near future. We should be ready to address them through innovative public and private sector partnerships and solutions. We must sustain these incubators because they made us challenge ourselves and our research work. Most importantly, we must sustain these incubators to enhance our research results and impact the lives of millions who depend on this sector.



Dr William D Dar
Director General, ICRISAT

Preface

Since 2009, Agri-Business Incubation (ABI) Program of ICRISAT has been handholding and mentoring the Business Planning and Development (BPD) Units that have been setup inResearch Institutes of the Indian Council of Agricultural Research (ICAR) and State Agricultural Universities (SAUs) in the country under the World Bank funded National Agricultural Innovation Project (NAIP). These BPD Units are essentially agribusiness incubation centers designed for promoting agribusiness ventures in the agriculture sector. The objective was to bring a change in the National Agricultural Research System (NARS) through innovative system that will inculcate innovation and enhance agribusiness development through innovation and entrepreneurship development.

Under the mentorship of ABI-ICRISAT, the BPD Units have so far commercialized 331 technologies and generated overall revenue of Rs. 2433 lakhs through technology commercialization, incubation services and other activities. The BPD Units have been able to promote agripreneurship in the country and is currently incubating 1218 entrepreneurs/ agri-based start-ups of which 91 ventures have successfully graduated.

A critical aspect of the mentoring process was to ensure that these BPD Unit become self-sustainable once the project end, and to a large extent ABI-ICRISAT has made it possible through securing different funding sources and developing a vast client base for these units. A major initiative to achieving this was the setting up of the Network of Indian Agri-Business Incubators (NIABI) that has become a hub for promoting technologies and entrepreneurship amongst the BPD Units and across the country. The agribusiness incubators have proven themselves to be capable of addressing the demands of both the farming community as well as that of the other larger players in the agricultural domain.

For us at ICRISAT, this handholding and mentoring partnership with NAIP-ICAR has been a very rewarding experience in terms of expanding our operations and knowledge. We are sure that our partnership initiatives will help in dealing with the diverse challenges and nature of the sector as we all strive forward in developing the agricultural sector and helping our smallholder farmers become more resilient and resourceful.

This publication highlights how the BPD Units along with ICRISAT have been able to bring in a change within the System and how agribusiness ventures and innovations can be promoted amongst farmers, youth and women, while also becoming a platform for larger agro-players to partner with.

We sincerely thank Dr. S. Ayyappan, Director General of ICAR for his vision in implementing and scaling-up the programme, Dr. D. Rama Rao, National Director of NAIP for his strategic guidance, and Dr. P.S. Pandey, National Coordinator, component -1 of NAIP for his constant support. I would also like to thank the Leaders, Principal Investigators and Managers of the twenty two BPDs who provided support in the successful establishment and operation of the programme. I sincerely thank Dr. William D. Dar, Director General of ICRISAT for his guidance and support in implementing this unique project. I would finally like to mention the dedication of my team from the Agri-Business Incubation Program at ICRISAT including SM Karuppanchetty, Jonathan Philroy, Divya Nancy, Bhubesh Kumar and Selvaraj Aravazhi and thank them for compiling this publication.

Dr Kiran K Sharma

Chief Executive Officer
Agribusiness and Innovation Platform
ICRISAT

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Abbreviations and Acronyms

AAU	Anand Agricultural University
ABI	Agri-Business Incubation Program
AIS	Agricultural Innovation Systems
ARYA	Attracting Rural Youth in Agriculture
ATMA	Agricultural Technology Management Agency
BAU	Birsa Agricultural University
BPD	Business Planning & Development
CCSHAU	Chaudhary Charan Singh Haryana Agricultural University
CDP	Community Development Program
CIAE	Central Institute of Agricultural Engineering
CIBA	Central Institute of Brackishwater Aquaculture
CIFA	Central Institute of Freshwater Aquaculture
CIFT	Central Institute of Fisheries Technology
CIPHET	Central Institute of Post-Harvest Engineering and Technology
CIRCOT	Central Institute for Research on Cotton Technology
CPCRI	Central Plantation Crops Research Institute
CPRI	Central Potato Research Institute
CRRI	Central Rice Research Institute
CSOs	Civil Society Organizations
FICCI	Federation of Indian Chamber of Commerce and Industries
GABI	Global Agri-Business Incubation
GDP	Gross Domestic Product
GoI	Government of India
HTM-BPD	Horticultural Technology Management-Business Planning & Development
IARI	Indian Agricultural Research Institute
ICAR	The Indian Council of Agricultural Research
ICRISAT	The International Crops Research Institute for the Semi-Arid Tropics
IIHR	Indian Institute of Horticultural Research
IISR	Indian Institute of Spices Research
IIVR	Indian Institute of Vegetable Research
IVRI	Indian Veterinary Research Institute
JNKVV	Jawaharlal Nehru Krishi Vishwa Vidyalaya
KVK	Krishi Vigyan Kendra
MSE	Medium Sector Enterprises
MoMSME	Ministry of Micro, Small and Medium Enterprises
NAARM	National Academy of Agricultural Research Management
NAEP	National Agricultural Extension Project
NAIP	National Agricultural Innovation Project
NARS	National Agricultural Research System
NATP	National Agricultural Technology Project
NDRI	National Dairy Research Institute
NIABI	Network of Indian Agri-Business Incubators
NIRJAFT	National Institute of Research on Jute and Allied Fibre Technology
NRC	National Research Centre
OECD	Organisation for Economic Co-operation and Development
SAUs	State Agricultural Universities
SFAC	Small Farmers Agribusiness Consortium
SMEs	Small and Medium Enterprises
SSE	Small Scale Enterprises
TNAU	Tamil Nadu Agricultural University
UOS	Un-Organised Sectors
VC	Venture Capitalists
VCO	Virgin Coconut Oil
VIA	Vanavarayar Institute of Agriculture
ZTM-BPD	Zonal Technology Management & Business Planning and Development

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CHAPTER I: NEED FOR ENTREPRENEURSHIP IN AGRICULTURE

Given the critical role of agriculture to the local economy and the centrality of smallholder farmers in agriculture, encouraging entrepreneurship in agriculture with focus on smallholder farmers would help the sector cope with the rapidly changing global environment. But for such transformation to happen in the sector, there needs enabling conditions that help nurture an entrepreneurial ecosystem which can help in making farmers take risks and operate agribusiness start-ups but can also enable other stakeholders of the sector to play a bigger and effective role that will enhance the development of the sector. The chapter focuses on the need for this transformation from within, the expected challenges and the way forward.

Entrepreneurship in Agriculture, Market Linkages and Value Chain

A significant quality entrepreneurs possess is that they innovate and for them, innovation is an instrument (Drucker 1986). Entrepreneurs operate through creative destruction (Schumpeter 1942). They try to address local issues and in the process use local resources, manpower and application of new technologies, thereby generating employment and income for the local economy. This has a multiplier effect on the economic cycle: the generation of demand and supply from the local economy leads to more value creation and newer allied ventures and thus acts as a catalyst for structural changes, growth of the economy and national competitiveness[1]. Formal small and medium enterprises (SMEs) contribute up to 45% of employment and up to 33% of the GDP in developing economies; these numbers become significantly higher once the contributions from the informal sector SMEs are also added[2].

Given the critical role of agriculture in the local economy and the centrality of smallholder farmers in agriculture, encouraging entrepreneurship in agriculture with focus on smallholder farmers would help this sector cope with the rapidly changing global environment. Entrepreneurship thrives on the ability to take risks, adapt and innovate. Given that they possess all this in good measure, smallholder farmers – who constitute close to 80% of the Indian farming community – are poised to be at the vanguard of the shift of the Indian agricultural sector to a more innovative, entrepreneurial and competitive paradigm.

Need for market linkages

Encouraging smallholder farmers to increase their productivity and diversify into higher value agriculture production that meets the market demand requires the building or strengthening of their market linkages. At present, these linkages at village levels are not strong enough. Smallholder farmers and SMEs in the rural developing world typically face access-to-market barriers due to infrastructural deficits (i.e., lack of rural roads, water management systems and distribution systems), limited access to knowledge and technology, and asymmetric market information[3]. Furthermore, only a very small share of smallholder farmers is fully market-oriented. Most of them produce exclusively for home consumption or for home consumption with the intention of selling the surplus in the market.

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1 2010 Global Report, Global Entrepreneurship Monitor. Retrieved on 2 June 2011 from http://www.gemconsortium.org/docs/266/gem-2010-global-report

2 IFC 2010. Retrieved on 2 June 2011 from www.ifc.org/wps/wcm/connect/1e6a19804fc58e529881fe0098cb14b9/IFC+Report_Final.pdf?MOD=AJPERES

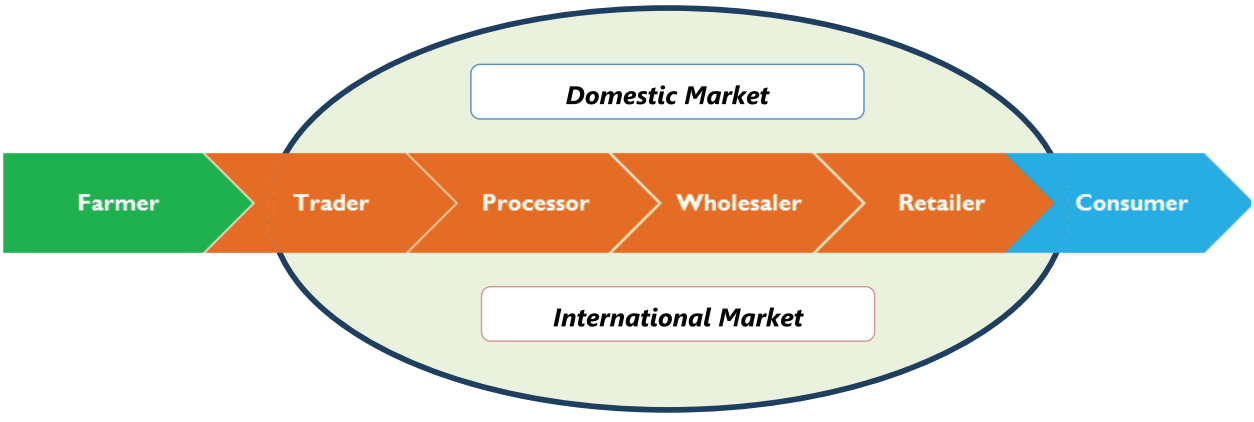
3 Guiddi.D (2011). Sustainable Agriculture Enterprise: Framing Strategies to Support Smallholder Inclusive Value Chains for Rural Poverty Alleviation

The challenge lies in enabling these farmers to become fully market oriented and encouraging them to make long-term investments and diversify into high value products with the aim of making profits. To achieve this, a value-chain approach that catalyses appropriate linkages of farmers to the markets needs to be nurtured.

Agriculture Value Chain approach

According to the Asian Development Bank, 'the sequence of steps and participants involved in the process from production to delivery of a product to market is called a value chain'. A value chain differs from a supply chain in that a value chain is about linkages generating value for the consumer while the supply chain is about processes of moving and transforming commodities into products from producers to consumers. While a value chain is about generating value for the consumer, a supply chain is about logistics. The productivity, efficiency, and depth of the value chains are important elements driving commercial agriculture and agri-business[4].

Figure 1. Agriculture value chain



Source: Agri-Business Incubation (ABI) Program, ICRISAT.

By becoming an active partner in the value chain (Figure 1), farmers will be able to realize better value for their products, either through better partners in the chain or by becoming a forward entity of the chain themselves. As can be seen from the above figure, the agricultural value chain can be very long and accommodates several players between the farmer-producer and the end consumer. Enabling farmers to access the chain as entrepreneurs and not just suppliers, will have a multiplier effect in rural development, as it will usher in a virtuous cycle of higher yields and production, more demand for diversified products – which creates a pull in the market and leads to growth of existing industries – and finding new ventures, all of which lead to local and national economic development.

However, there are several issues with the current value chain in the Indian agricultural scenario. The agricultural value chain in India tends to be long due to the number of middle-men involved. As a result, the farmer-producer usually gets only 25-30% of the end-consumer's price (FICCI Agricultural Summit 2006). The chain remains disjointed and transaction cost and product loss remains high, especially for

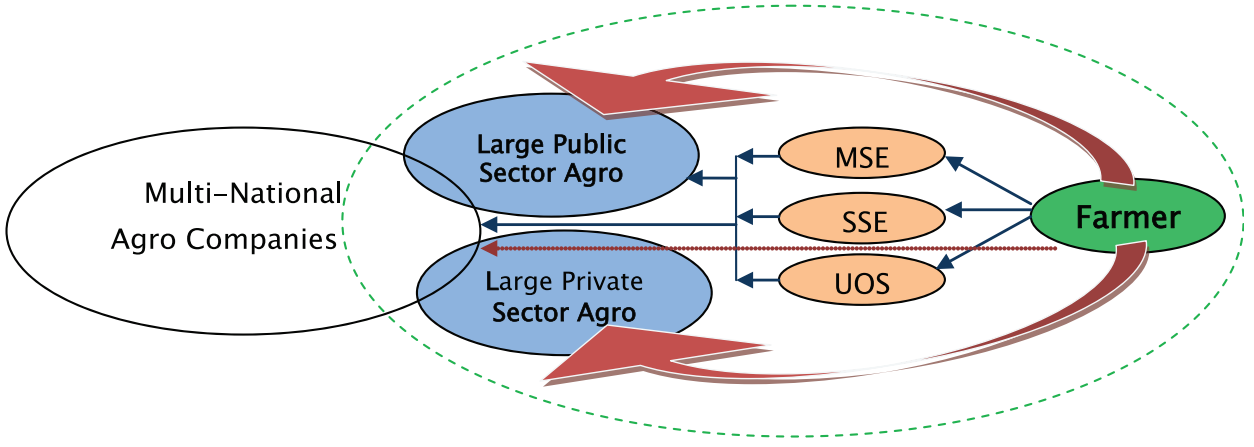
4 ADB (2012). Support for Agricultural Value Chain Development. Evaluation Knowledge Study

the producer. These show that an agri-business venture driven from bottom-up and along the chain has a lot of potential for business gains, and offers benefits that will accrue to the farmer producer. At a time when farming is becoming more cost intensive, this can be one of the approaches to revive the declining livelihood and potential of the sector.

Agri-business Ecosystem

For the growth of an ecosystem that links farmers with markets, entrepreneurship and agri-business ventures need to be promoted. Such ventures will create a pull in the local economy and will connect with the farmers far more effectively than other initiatives, and help them to access the value chain, as can be seen in Figure 2. It will also enable adapting the agro-technologies from the research stations to local conditions.

Figure 2. Linking farmers to markets



Source: Datta Mazumdar, Saikat & Philroy, Jonathan[5]; smaller players who are Small Scale Enterprises (SSE), Medium Sector Enterprises (MSE), the Un-Organised Sectors (UOS).

As agri-business is a broad term, encompassing the collective business activities that are performed from farm to fork (Food and Agriculture Organization), it allows for many types of entrepreneurial categories. At the farm level agri-business opportunities exist in any sector of agriculture such as farming, horticultural ventures, livestock and dairying and fisheries; as service providers such as input ventures; ancillary ventures such as soil testing, meteorology services, cold-storage services, transportation, trading and credit agencies run by farmer groups; and processing and marketing ventures, just to mention a few. The ecosystem will also help in evaluating new local technologies that are generated at any point in the chain, which can then be scaled up.

Challenges to entrepreneurship in Indian agriculture

Given that agri-business ventures are played out in a live and at times unpredictable environment involving natural and artificial entities, the following challenges to entrepreneurship exist in the sector:

5 Mazumdar, S D and Philroy, J (2011) *Food and Nutritional Security. Retrieved from* http://oar.icrisat.org/id/eprint/7052

- **Motivation:** Agri-business is a challenging field with considerable risks and varying returns, which might take many years to be realized. The difficulty in accessing credit for agri-business ventures in the initial stages, government clearances, regulatory issues, etc, can be major deterrents for a newcomer. This is further exacerbated by poor management skills, lack of access to raw materials and inadequate scientific knowledge. Access to modern technologies is also lacking, primarily due to disconnect between extension agencies and the farming community.
- **Knowledge:** The entrepreneur should be able to access relevant information regarding the nature of the business and its social and financial benefits. Apart from the scientific and technical details, the entrepreneur should also be equipped with knowledge of financial management, people management and should be aware of the government policies and regulatory issues that can have a bearing on the start-up venture. Networking also plays a vital role in ensuring the viability of the firm and in getting entry into the market.
- **Skills:** It may not be possible for entrepreneurs to have all the skills required for their respective enterprise; however, they need to possess certain generic skills required by any entrepreneur, including self-motivation, self-confidence, work ethics, time management, administrative skills, and knowledge of sales, marketing, and finance, and other skills specific to their own venture. Currently, the avenues available for an Indian entrepreneur to acquire skills through adequate training and/or hand holding support in agri-business ventures are very limited.
- **Market/Business development:** In today's competitive scenario, marketing and selling one's product is not an easy task. The challenges involve finding a suitable market, developing the marketing channels, and reaching the end consumers. Whether for an existing or a developing market, these are formidable challenges faced by all entrepreneurs. Product development and acceptability amongst customers remain critical challenges, especially in the food processing sector.
- **Finance and Risk mitigation:** The development of agri-business and agro-industries will require a substantial infusion of fixed investment and working capital. Early stage start-ups and SMEs generally find it difficult to get access to finance. Public sector banks look for adequate collateral and credit worthiness of the entrepreneur before funding and are generally risk averse. The risk mitigation mechanism is also not well developed in the sector, thereby leaving agripreneurs and farmers in a difficult position. Besides, the tendency to avoid taking risks is more marked in the Indian psyche.
- **Regulatory issues:** The new Indian regulatory scenario, following the introduction of Food Safety Standards Authority of India regulations, poses several challenges for entrepreneurs. Restrictions on marketing, futures trading, and export and import of various items have the potential to constrain innovative agri-business ventures. Each segment of the sector has its own rules and regulations and lack of knowledge and its applications will hamper the growth of entrepreneurship in the sector.
- **Bottlenecks in Business environment:** Business facilitation environment within the country is yet another challenge. Access to relevant information and quality infrastructure is lacking and this leads to additional costs for the entrepreneur. Based on various parameters, India is ranked 134 amongst 189 economies on ease of doing a business in the latest scores released in Doing Business 2014 report

of the World Bank[6]. In terms of starting a business, India is ranked 179 and involves 12 procedures and takes 27 days to start a venture, whereas in New Zealand (ranked #1 in this parameter), it involves 1 procedure and half a day. The average in the South Asian region is 7 procedures and 16 days. For the unorganized sector SMEs, these numbers are bound to be higher. These statistics show that setting-up shop in the country, especially for SMEs, can be a long and arduous task.

Way Forward: The Case for Agri-business Incubators

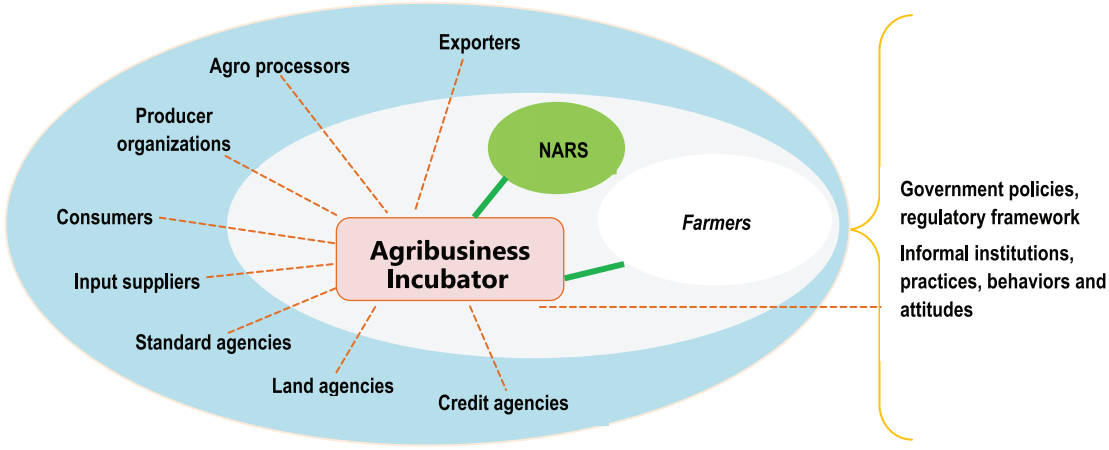
The growth of entrepreneurship in the sector is very much the need of the hour. However the challenges that can hinder such growth are numerous. There is need for a mechanism that can facilitate agri-business ventures. Business incubators are proven to be an effective model that can be considered not only for technology transfer and commercialization but also in achieving growth of the venture by offering the required business ecosystem. It has also proven to be a flexible platform for promoting entrepreneurship through which inclusive development of the community — and thereby the economy — can be achieved. Agri-business incubators are relatively new to the arena, but have seen considerable success, which can be a compelling reason to view this as an alternative and effective extension model for the growth and prosperity of the agricultural sector and rural sector.

With the approach to agricultural development now shifting to a more market-oriented focus, the concept of Agricultural Innovation Systems (AIS) presents a paradigm shift that is attractive not only because it offers a holistic explanation of how knowledge (at local/regional/national level) is produced, diffused, and used, but because it emphasizes the need to have continuous and interactive learning amongst different stakeholders connected with the sector: farmers, researchers, extension agents, policymakers, private and public sector companies, civil society organizations, etc. The system is designed to succeed from the linear research-to-market model and adopts a demand-driven approach which will see innovative and unique partnerships amongst the different stakeholders. It essentially stresses the need to offer holistic support systems to farmers and to bring all the stakeholders on a common platform.

However, for the system to be fully operational, it needs a facilitator to enable the linkages and interactions. In its quest to promote entrepreneurship in the sector, the agri-business incubator, given its flexible and dynamic nature which allows it to have a diverse set of services that are customized to local conditions, needs to connect with different stakeholders in the sector to take up additional services or identify new partners from the market space (Figure 3). It can thus be seen that an agri-business incubator fits the role of facilitator very well: the role of bridging amongst different entities, brokering transactions and catalyzing the growth of new partnerships and getting the required results at the grassroots level, all of which should ultimately be benefiting the farmer. In a nutshell, the incubator can be considered a new model in agricultural extension.

6 World Bank. 2013. Doing Business 2014: Understanding Regulations for Small and Medium-Size Enterprises. Washington, DC: World Bank Group. Retrieved on 31 October 2013 from http://www.doingbusiness.org/~/media/GIAWB/Doing%20Business/Documents/Annual-Reports/English/DB14-Full-Report.pdf

Figure 3. AIS & Agribusiness incubators



Source: World Bank (2012); modified by Agri-Business Incubation (ABI) Program, ICRISAT

Agri-business incubation thus not only becomes a channel to commercialize technologies but also complements farmer development, provides researchers with an avenue for feedback, facilitates investments (physical and fiscal) into the value chain, and fosters the growth of SMEs that improve and increase rural non-farm employment opportunities thereby adding value to primary agricultural produce and aiding livelihood development.

The future course of agricultural growth needs a mechanism that brings together the public and private players to advance new agro-technologies and reach out to the farmers. The 12th Five Year Plan (2012-17)[7] rightly stresses the need to keep the smallholder farmer at the center of any developmental initiative. The Plan Document cites the following focus areas in the section on major challenges and priorities for the agricultural sector:

- Viability of farm enterprise and returns to investment that depend on scale, market access, prices and risk.
- Availability and dissemination of appropriate technologies that depend on quality of research and extent of skill development.

The initiatives proposed by the Indian Council of Agricultural Research (ICAR) in the Plan period such as National Agricultural Entrepreneurship Project, Student Rural Entrepreneurship and Awareness Development Yojana (Student READY), Attracting Rural Youth in Agriculture (ARYA), and Farmer FIRST, all focus on the grassroots level and in promoting entrepreneurship and technology development. Innovative partnerships and ways to address the diverse needs of the actors in the agricultural domain have to be designed if farmers, public and private ventures, and even nations are to cope, compete and sustain themselves in the midst of the global economic changes. And agri-business incubators will play a vital role in this endeavor.

7 Planning Commission, Government of India. Retrieved on 12 February 2014 from planningcommission.nic.in/plans/planrel/12thplan/pdf/12fyp_vol2.pdf

CHAPTER II: BUSINESS INCUBATORS: A TOOL TO PROMOTE ENTREPRENEURSHIP

The development of a competitive, sustainable agribusiness community needs an effective innovation and entrepreneurship ecosystem, which fosters the growth of agribusiness ventures and resolves issues at the grassroots farming level. This needs different stakeholders in the agricultural sector to work in coordination and provide services such as adequate infrastructure, accessibility to finance and resources such as technologies, along with supportive policies and regulations to make the ecosystem more responsive and effect a positive change in the predominantly agriculture based community of India. Such an ecosystem needs a platform to enable these linkages between research and business and which helps the farmer to access them and help become an entrepreneur. We look at how an agribusiness incubator can be that platform that connects all the stakeholders and yet can help in the transformation of the farmer's livelihood. The chapter outlines what can be expected from an agribusiness incubator.

In general, start-up companies are particularly vulnerable in their early stages of growth since the business environment is generally hostile and there are not many options available for testing one's idea due to lack of funds, technical support, networks and infrastructure. Studies show that worldwide, while 66% of new start-ups survive after two years of starting up, the survival rate reduces to 44% after four years. An Organization for Economic Co-operation and Development (OECD) study shows that over 70% of start-ups wind up their operations by the seventh year of their operation[8]. This is where business incubators play a vital role and provide solutions to entrepreneurs for dealing with the difficulties faced during the start-up stage.

Business Incubators

Business incubation is now widely acknowledged as a way of meeting a variety of economic and socioeconomic policy needs, which can include[9]:

- Promoting entrepreneurship and thereby creating employment and wealth at local and national level.
- Platform for technology transfer and commercialization.
- Identifying and nurturing innovations.
- Enhancing the links between universities and R&D centers and the business community and taking research to the market.
- Supporting small, local firms and helping the development of industrial hubs.
- Dealing with market failures relating to knowledge and other inputs of the innovative process.

Such incubators facilitate the bringing together of a set of business development services and diverse partners to help the budding venture attain sustainability and later scalability. In general, with incubation support, the closure rate has been shown to come down to 15–20% amongst incubator tenants.

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8 *info*Dev *(2009). Mixed use incubator handbook.*

9 *ibid.*

Incubators have evolved over the years since the inception of the first incubator in 1942; depending on the environment, different types of incubators are now present across the world: Mixed portfolio, Sector oriented and Technology oriented.

In general, an incubator is a physical location that provides a defined set of services to individuals or small companies. This usually includes office spaces, access to technology, financing, technical assistance and business development services such as marketing, legal, finance, manpower recruitment and training, mentoring, and networking with industries, government bodies, etc. By locating similar or complementary entities in proximity to each other, the incubator may also play a critical role in promoting knowledge transfer, both formally and informally[10].

Thus an incubator benefits the various stakeholders in the ecosystem in different ways. While business development and job creation remain the primary benefits, innovators at grassroots level get a chance to scale their ideas to market stage, universities and R&D centers get an outlet to commercialize their technologies, companies get access to innovations and products thus achieving economies of scale, funding agencies get an opportunity to fund feasible ventures at lower transaction costs, and the local and national government benefit through job creation, increased tax revenue and growth of different sectors, which leads to economic development. The incubator therefore remains an important agent of change in the ecosystem.

Studies show that for every US$ of public investment in an incubator, the return has been US$ 30 in local tax revenue; 84% of incubator graduates stay in the community where they were incubated (thus keeping the economic cycle running) and 87% of the graduated firms remain in business.

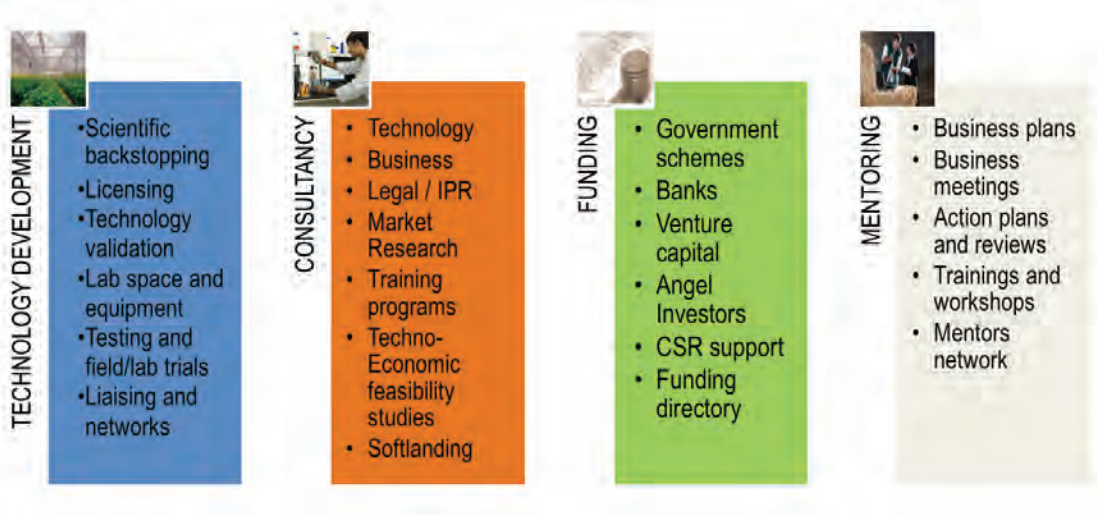
Source: The World Bank (2012). 'Agricultural Innovation Systems: An Investment Sourcebook'

Agri-business Incubators

In view of the multiple challenges faced by the agricultural sector such as vagaries of nature, price volatility, infrastructure deficits and lack of access to finance, apart from technological and market risks, the agri-business incubator provides a different dimension of services when compared to its contemporaries. Some of the generic services provided by an agri-business incubator are shown in Table 1.

10 *info*Dev *(2009). Mixed use incubator handbook.*

Table 1. Generic services offered by agri-business incubators

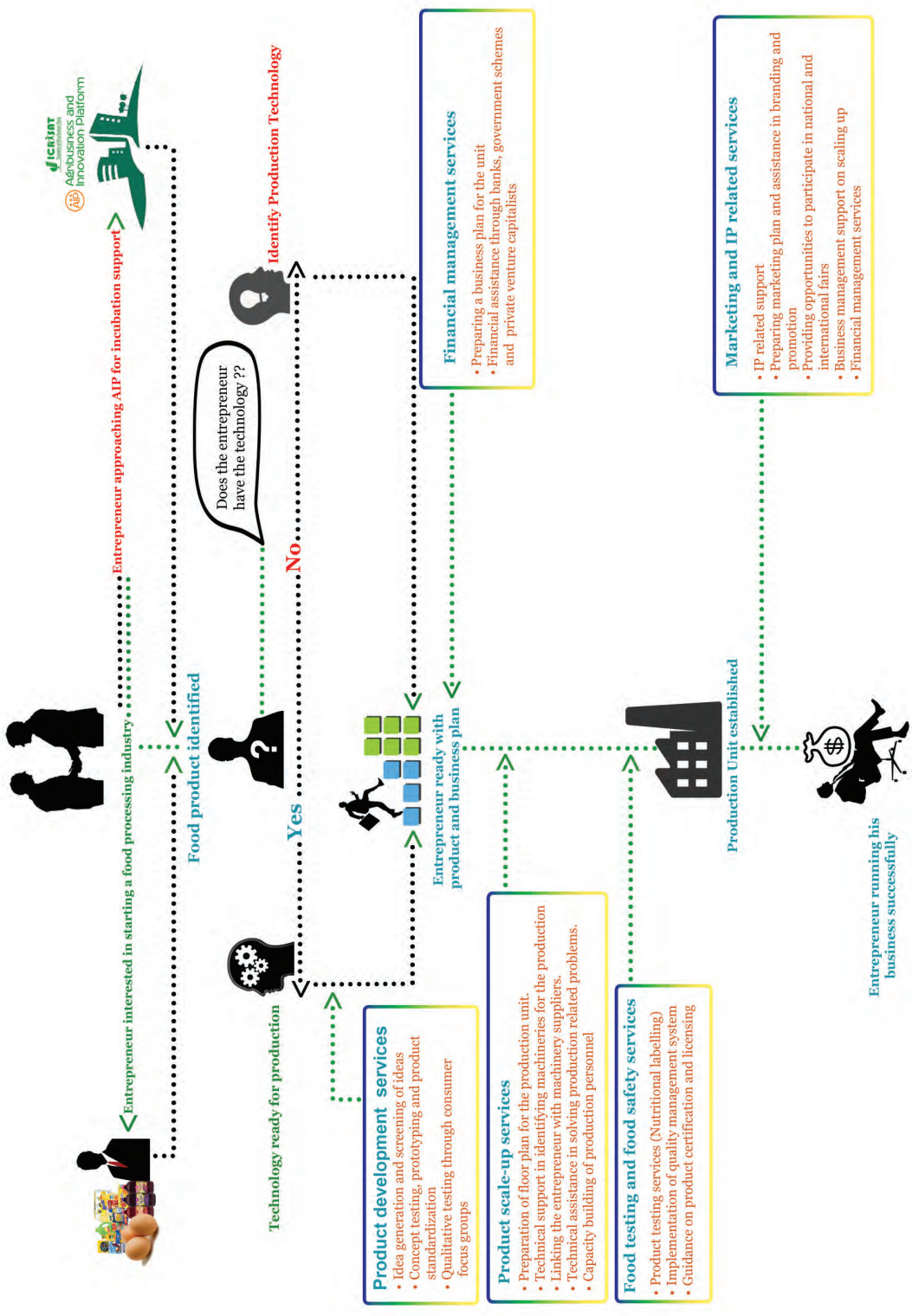


Source: Agri-Business Incubation (ABI) Program of ICRISAT.

Given that the agriculture system is a *live* model, the incubator does not need to operate as a physical entity alone, but can provide its services on the ground and in virtual mode as well. One of the advantages such incubators have over other business support systems in agriculture is the ease with which it can intervene in any of the business development phases of an agri-business venture. As an example, Figure 4 shows how agri-business incubators operate in the context of supporting a food processing based SME.

The changed agricultural development scenario, which needs more meaningful partnerships and feedback mechanisms for its growth, requires a dynamic and flexible model such as a business incubator to help farmers improve productivity of the sector and, thereby, livelihood. While technology commercialization is important, the incubators bring in the much needed perspective of market-oriented research to the research institutions. By providing for an incubation ecosystem, the incubators will provide an opportunity for farmers and rural youth to proceed beyond just farming and engage in more meaningful mechanisms of economic contribution through creation of ventures and employment opportunities.

Figure 4. Agri-business incubator services for food processing SMEs



Source: http://oar.icrisat.org/7259

CHAPTER III: BPD UNITS: AGRI-BUSINESS INITIATIVES IN INDIA

The Business Planning & Development (BPD) Units were started way back in late 2008 by the Indian Council of Agricultural Research (ICAR) in a bid to catalyze changes in research and development activities within the Council. The chapter provides a brief insight to the rationale for setting up the BPD Units.

The ICAR is an autonomous organization under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture, Government of India. It is the apex body for co-coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country. With 99 ICAR institutes and 53 State Agricultural Universities (SAUs) spread across the country, this is one of the largest national agricultural systems in the world. Apart from these entities, the National Agricultural Research System (NARS) comprises 631 Krishi Vigyan Kendras (KVK), 17 National Research Centres (NRC), six National Bureaus, and 25 Project Directorates, along with the line departments at the State level. The private sector agro-companies and Civil Society Organizations (CSOs) that operate in the agricultural domain are also part of the NARS.

Through these many agencies, the agricultural extension mechanism plays a vital role in taking research to the farmers and the markets. Over the years, extension services have continued to evolve with programs like the Community Development Program (CDP), location-specific extension activities such as Intensive Agricultural District Program, Intensive Agricultural Area Program, Integrated Rural Development Program and the Training and Visit (T&V) system of extension that was introduced under a World Bank-financed project. These were later followed by the National Agricultural Extension Project (NAEP) and the National Agricultural Technology Project (NATP). The latter was instrumental in implementing the Agricultural Technology Management Agency (ATMA) at the district level, which reformed the traditional extension system to a very significant extent by integrating extension programs across line departments.

Changes in NARS

Understanding the complexities facing the sector, the ICAR had undertaken new strategies to address the same. The National Agricultural Technology Project (NATP), supported by the World Bank, focused on technology-led-pro-poor growth and facilitated public sector reform processes for accelerating the flow of agricultural technologies.

A key lesson from the NATP was that deliberate investments in partnership building and shared governance are required to speed up technology adaptation and dissemination.

'Indian Agriculture is the largest private enterprise run by 65 crore farmers serving a huge consumer base of 125 crore people. Indian agriculture today is a broad-based and complex system due to climate change and trade related issues. But the sector has a huge business potential waiting to be explored and there is a need for integration of innovation with incubation of technologies.'

Dr S Ayyappan, Secretary, DARE and Director General, ICAR in his Inaugural Address at the Agri-Investors Meet, July 2013

This was followed by the ongoing World Bank funded, National Agricultural Innovation Project (NAIP), which gave high priority to generation and transfer of agricultural technologies, and promoted agri-innovations as a way to generate income and employment opportunities for rural communities.

Agri-business Incubators in NARS

As outlined in the NAIP Project Implementation Plan, the Business Planning and Development (BPD) Units were set up through the NAIP under its Component I[11] activities with the objective of encouraging, nurturing and supporting technologists and scientists to turn their innovative research ideas into sound commercial ventures by engaging with entrepreneurs, start-up ventures, and public and private sector companies. In the short span of three years, the BPD Units (or agri-business incubators) have played a significant role in driving sustainable and lasting change in the way agricultural research is conducted in the NARS.

In the *ICAR Vision 2030* document, the Council highlights the need for an effective agricultural invention-and-innovation continuum to exploit the opportunities and address the challenges and problems emanating from both the supply and demand perspectives. Indeed, evolving effective mechanisms for technology delivery and enhancing the capacity of all stakeholders in the invention-innovation continuum are the preconditions for a more remunerative and sustainable agriculture sector.

The BPD Units could be the ideal platform to build this continuum. Business Incubators have the unique advantage of developing multiple partnerships amongst research bodies and public and private sector entities to come together and share their innovations, knowledge and ideas.

The current group of BPD Units were set up in two phases: 10 were begun in late 2009, and their performance within the span of three years helped set up 12 more units in June 2013. A key reason for their success was the decision of the NAIP to have a handholding and mentoring partner for guiding the BPD Units in their initial stages of operation. This incubation of incubators was entrusted to the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and its ABI Program (ABI-ICRISAT).

Figure 5 shows the location of these units, through which the ICAR is now able to provide entrepreneurial opportunities in almost all sectors of agriculture across the country.

11 *The goal of this Component is "To accomplish science and technology-led, sustainable socioeconomic gains by applying inventions emerging from the NARS through technology validation, technology transfer and enterprise development". (NAIP Project Implementation Plan, February 2006)*

Figure 5. BPD Unit Network

Source: Agri-Business Incubation (ABI) Program, ICRISAT.

CHAPTER IV: EMPOWERING INDIAN INCUBATION THROUGH HANDHOLDING AND MENTORING

The concept of business incubation was new to the Indian National Agricultural Research System (NARS), and the Council felt the need to have a handholding and mentoring partner to help the newly inducted BPD Units to grow and become sustainable in their operations in the long term. The ABI Program of ICRISAT was chosen for this purpose in view of its experience and expertise in the field of nurturing incubators and start-ups in agri-business. This chapter highlights the key roles initiated by ABI-ICRISAT that helped it in achieving the mandates it was entrusted with, in terms of ensuring that the BPD Units were able to achieve targets and bring in positive changes within the NARS.

Need for a Handholding and Mentoring Partner

The National Business Incubation Association (NBIA)[12] estimates the total number of business incubators to be about 7000[13], most of them operating in the Information and Communication Technology (ICT) sphere. Agri-business incubators are a small segment in the global incubator community and it is estimated that there are around 80-90 such incubators currently in operation, especially in developing countries in Asia, Latin America and Africa.

Operating within an agri-business domain needs a contextual understanding of how a business incubator operates and a high level of customization, given the diverse background, needs and challenges of the agricultural sector and its various stakeholders. The need to have a divergent perspective is greater in this segment than the *plug & play* model that is frequently seen in other incubation domains.

Given this, and also the fact that agri-business incubators was a new concept to the Indian NARS, the need was felt to bring on board a proven incubator that could guide, nurture and support the activities of the BPD Units, in short *incubate* them in their initial years of operation. The task was entrusted by the NAIP to ABI-ICRISAT.

Handholding and Mentoring Partner: ABI Program of ICRISAT

ICRISAT is a non-profit, non-political organization that conducts agricultural research for development in Asia and sub-Saharan Africa with a vision to help empower the smallholder farmers and the poor in these regions to overcome poverty, hunger and a degraded environment through better agriculture. Understanding the changing landscape in the agricultural sector and the need to bring in entrepreneurship with the farming community for achieving inclusive growth and fast-tracking development initiatives in the sector, it was felt that a multifaceted platform needs to be developed at the Institute level. The ABI-ICRISAT Program was born out of this idea and initiated in 2003, with the support of the Department of Science and Technology (DST) of the Government of India (GoI). The incubator at ICRISAT was the first agri-business incubator in the country and ICRISAT was the first among the Consultative Group of International Agricultural Research (CGIAR) institutions to have one.

12 *NBIA is considered to be the world's leading organization advancing business incubation and entrepreneurship*

13 *NBIA FAQs. Last accessed on 15 May 2014 from http://www.nbia.org/resource_library/faq/#3*

The activities undertaken by ABI-ICRISAT are in line with what was conceived of the Inclusive Market Oriented Development (IMOD) approach of ICRISAT. It has become the visible hub at ICRISAT that has helped connect farmers and rural entrepreneurs with markets, taking technologies from the Institute and its partners to the market, proving that a Technology Based Incubator (TBI) can be an excellent platform that brings together all the stakeholders – farmers, scientists, public and private companies, government and funding agencies – to help develop an Agricultural Innovation System. The incubator was a precursor to the Agribusiness and Innovation Platform (AIP), (formerly the Agri-Science Park) which ICRISAT set up in 2004.

ABI-ICRISAT operates with the mission of improving the well-being of the poor through creation of competitive agribusiness enterprises by technology development and commercialization.

The incubator works on five thematic areas including seed business ventures, bio-fuels ventures, farming ventures, agri-biotechnology ventures and Innovative ventures.

Services offered: Scientific consultancy for technology development, standardization and commercialization; lab, land and office space; facilitating access to funds; providing business consultancy, networking and business development support for start-up ventures; and conducting capacity building programs.

Specialized services include funding innovations and soft landing for foreign agribusiness firms who wish to set up base in India.

Over the past ten years, ABI-ICRISAT has been able to create an impact in the following different aspects of business incubation:

- Facilitated extended research and market linkages for ICRISAT R&D on sweet sorghum for ethanol production and Bt cotton seed multiplication for a large biotechnology company.
- Developed a novel seed business model through farmer entrepreneurs that addressed demand-supply gap of good quality seeds of pulses such as groundnut and pigeonpea. Overall, it is estimated that ABI-ICRISAT has benefited more than 500,000 farmers in Andhra Pradesh, Maharashtra, Madhya Pradesh, Karnataka and Tamil Nadu.
- As a TBI, facilitated commercialization of more than 200 technologies from ICRISAT and partners in the NARS.
- Facilitated business development worth US$ 17.3 million for clients and Institute. ABI-ICRISAT also helped a few of its clients access the international market through its partnership with other incubators abroad.
- Perfected a co-business incubation model that leverages the strengths of the agri-business incubators within India and abroad, and also with other incubators in the country.

ABI-ICRISAT has won:
Best National Technology Business Incubator award from the GoI in 2005

Best Business Incubator award of the Asian Association of Business Incubators (AABI) in 2007

Best Business Incubator award from Villgro in 2009

Best Incubator by the Federation of Indian Chambers of Commerce & Industry (FICCI) for 2013.

- Supported innovations from grassroots level by providing technical and financial assistance from the incubator.
- Developed an outreach strategy that now comprises agri-business incubators in India, and extends to Nepal, Indonesia, Sri Lanka, Philippines and the African continent, thereby supporting a greater number of agri-business ventures to benefit farmers in the region.
- The team at ABI-ICRISAT is an optimal mix of youth and experience and has developed and executed incubation services and new incubator programs.

These were some of the reasons the NAIP chose ICRISAT and its ABI Program as the handholding and mentoring partner for this sub-project under its Component I[14] efforts.

Overall Objectives of Handholding

The initiatives made by ICRISAT through ABI-ICRISAT focused on attaining the following overall objectives:

- Develop infrastructure and required facilities at incubator level for promoting agri-business ventures.
- Develop process and guidelines for setting up incubators and effective servicing of the incubatees.
- Monitor progress of the BPD Units and guide them towards realizing their targets and potential.

Based on the above, ABI-ICRISAT developed the following intervention strategies to help the BPD Unit grow and sustain their operations after the project period.

Infrastructure:

- Creating infrastructure facilities like office spaces and laboratories for supporting entrepreneurs and innovators.
- Creating a databank of indigenous agrotechnologies for commercialization from ICAR, SAUs, etc.
- Identifying international agrotechnologies suitable in the Indian context.
- Creating a networking platform for agripreneurs and mentors.
- Generating an opportunity to facilitate funding to start up agri-business.

Process:

- Capacity building / training program for BPD managers on new initiatives and approaches in agri-business incubation.
- Mentoring and guidance of BPD through direct visits and annual meetings.
- Promotion of agri-business incubation nationally through co-business incubation.

14 *The goal of this Component is: "To accomplish science and technology-led, sustainable socio-economic gains by applying inventions emerging from the NARS through technology validation, technology transfer and enterprise development". (NAIP Project Implementation Plan, February 2006)*

Outcomes:

- Facilitate business development for incubatees of the BPD Unit through different platforms such as B2B meetings, participation in local and international exhibitions, e-marketing and networking events.
- Create a network of mentors for providing advice and guidance to incubatees and help BPD Units to get new projects.
- Facilitate soft-landing support for incubatees planning to set up operations abroad and agri-companies planning to enter Indian market.
- Facilitate creation of the Network of Indian Agri-Business Incubators (NIABI) for building synergy amongst BPD Units and to promote technology commercialization and incubatee business development through its pan-India presence.
- Facilitate sustainability of the BPD Units by availing various schemes and projects of the GoI and facilitate private sector partnerships for mutual growth.
- Recognize the best BPD Unit and BPD Unit incubatee through annual awards for their excellence in promoting agri-business incubation in the country.

Interventions of Handholding and Mentoring Partner

The role of the handholding and mentoring partner for this sub-project from NAIP was to ensure that the BPD Units were able to become a sustainable entity within the NARS and to promote their technologies and incubator services to potential entrepreneurs in the sector. The section focuses on the interventions made by ABI-ICRISAT and its results, which have helped in the growth of the BPD Units and helped in institutionalizing the concept of agri-business incubation in the Indian NARS.

Institutional Interventions

In the short span of four years, the 22 BPD Units (or agri-business incubators) established in ICAR and SAU Institutes have played a significant role in enabling sustainable and lasting change in the way agricultural research is conducted in the NARS.

Critical to the successful establishment and operations of the BPD Unit was the need to ensure that the top management at the institute level understood the concept of an agri-business incubator and accepted this model into the activities and operations of the BPD Unit. Sensitization meetings and periodic appraisals were held with the top-level officials of the Institute and NAIP. This helped ensure the buy-in of the management for most of the activities and operations of the BPD Unit.

Functional autonomy is an area where ABI-ICRISAT has made efforts to ensure that the incubator services are not held back by red tape. The proactive nature of the top management at most of the BPD Units has seen them operating at a high level of efficiency, but keeping within the mission of the Institute. The BPD Units are the business incubation centers in the institute dealing with the government agencies, private sector companies and individual entrepreneurs. BPD Units have to extend timely incubation services in a customized manner. To do so, the BPD Unit team has to be vested with the required authority and the

units have to be given enough autonomy. To ensure better autonomy, ABI-ICRISAT has guided the BPD Units to register themselves as a Society or Section-25 company. The Tamil Nadu Agricultural University (TNAU) was the first to register its BPD Unit as a society. This lead was followed by other BPD Units in ICAR institutes and SAUs.

To avoid duplication of efforts, ABI-ICRISAT was able to successfully convince NAIP and ICAR to merge the Institute Technology Management Units (ITMUs) and the Zonal Technology Management Units (ZTMUs) wherever they existed in institutes with a BPD Unit, and to elevate the BPD Unit as a single window system for technology commercialization and promotion of entrepreneurship. This has helped to streamline the operations and process involved in providing such services.

ABI-ICRISAT has facilitated strategic partnering of BPD Units amongst institutes within and outside the ICAR so as to leverage their strengths in providing relevant technology and support to clients of the BPD Unit. This involves planning and development, capacity building, seed fund for incubators, development and establishment of incubation service modules, consultancy services, facilitation support and co-branding, and ensuring sustainability through monitoring and evaluation. For example, the BPD Unit of Central Plantation Crops Research Institute (CPCRI) is setting up a coconut value chain in partnership with Vanavarayar Institute of Agriculture (VIA), Pollachi, Tamil Nadu. This will aid in promoting technologies and scientific expertise of CPCRI to the farmers' groups that VIA will mobilize, helping the BPD Unit create social as well as business impact.

Technological Interventions

One of the earliest interventions by ABI-ICRISAT was to help the BPD Units develop a database of agrotechnologies of their respective parent institute. This helped in promoting numerous technologies from these institutes, most of which were *kept on the shelf,* and starting up ventures based on these technologies. Formats for technology cataloguing were shared with the units for collecting and analyzing the data of each technology, after which they were trained on how to target each technology to the concerned sector. This has helped in commercializing 331 technologies among 518 licensees through the BPD Units, which has brought in additional revenue to the NARS and much higher revenue than before BPD Units were conceptualized.

ABI-ICRISAT was also able to institutionalize the process of technology commercialization among the NARS through its efforts for the NAIP Agri-Tech Investors Meet of July 2013. A multi-step process involving technology identification, shortlisting based on evaluation and valuation against benchmarked technologies, promotion and marketing, and finally selling them through business meetings gave the BPD Unit personnel and officials in the NARS a glimpse of how technology commercialization can be scaled up within the System. The meet saw 53 technologies developed under NAIP getting commercialized to 80 licensees and generating Rs 31.5 million as technology license fee. A technology compendium was also developed by ABI-ICRISAT for promoting technologies amongst private and public sector companies and agri-business based SMEs.

ABI-ICRISAT also brought in contract research-based initiatives between institute and private sector agro-companies through the BPD Units, such as research on CRY 2*Ai* gene by TNAU with Bioseed Research India

Limited, which was facilitated by ABI-ICRISAT and BPD Unit, TNAU. Technology consultancy work was also initiated by the handholding partner in the NARS by facilitating such activities at BPD Units in CIFT and TNAU.

Operational Interventions

ABI-ICRISAT conducted many mentoring and training sessions to enhance the skills of the BPD Unit team in dealing with incubator management and troubleshooting the many issues that generally come up in business incubation. Apart from generic topics like financial management and marketing, these sessions also focused on client servicing and engagement, mentoring and guidance tools, and also specific areas of operations to be performed in the agri-business incubation domain. ABI-ICRISAT is the only agri-business incubator in the country to have an *info*Dev (The World Bank) certified trainer.

ABI-ICRISAT was also involved in the development and refinement of the business plan for each BPD Unit, providing key strategic inputs and overview for operationalizing and ensuring sustainability of the incubator in the long term. It also played a key role in the policy framework and guided the incubators in their governance and management system. Host-institute integration is critical to the survivability of the BPD Unit and this was one of the primary issues tackled at each visit to the BPD Unit and institute meetings.

Infrastructure and key documents such as Operational Manuals, Standard Operating Procedures, Terms of Reference (ToR) and Sample Agreements related to incubator operations and management were provided by ABI-ICRISAT. A critical area of support provided to the BPD Units to benefit their incubatees was that of Mentors Booklet and Funding Directory. The booklet was prepared after shortlisting and interviewing many applicants from the field of agri-business, while the directory was a ready reckoner of all the funding agencies-public, private and Venture Capitalists (VCs) that can be approached by the BPD Unit in securing funding support for their clients.

To help enhance the outreach of the BPD Units and technologies, ABI-ICRISAT developed a Co-business Incubation approach that works in developing the capability of the unit as well as promoting technologies from different sectors (represented by the different sectors of the parent institutes of the BPD Unit) across the country. For example, BPD Unit at the Anand Agricultural University (AAU), Anand was able to promote coconut based technologies of CPCRI, Kasargod for which the technology details and support was provided by the BPD Unit of CPCRI.

Hands-on experience was provided to the BPD Unit in organizing agri-business camps for promoting technologies and identifying innovations. ABI-ICRISAT also participated in numerous exhibitions across the country to promote the BPD Unit as well as its clients, which has helped both the categories in business development. Promotional activities were also done in new countries, which helped some of the clients get business orders from overseas companies.

At the management level, ABI-ICRISAT constantly brought to the notice of NAIP the many issues that plagued the incubator's operations and facilitated their entry and operating domain within the parent institute's activities. Although many new issues and constraints have now been identified, ABI-ICRISAT,

with the support of NAIP and ICAR, has been able to provide solutions to most of them. This has helped in better performance and results from the incubators.

Fund mobilization for sustainability

A critical aspect of the handholding and mentoring activity was to ensure that the BPD Units became self-sustainable after the project ended. For this, efforts were made by ABI-ICRISAT to identify and highlight sources of revenue such as membership fees, incubator service packages, consultancy assignments, etc. It was proposed by ABI-ICRISAT that BPD Unit should retain revenue with the unit itself rather than providing it to the central pool, so that it can be used by the unit for its operations. This proposal is under consideration by NAIP.

Apart from this, ABI-ICRISAT approached various Government agencies for schemes and grants available for the promotion of entrepreneurship and helped secure their support. These agencies included the Ministry of Micro, Small and Medium Enterprises (MoMSME) of GoI, Small Farmers Agribusiness Consortium (SFAC), Department of Biotechnology, and DST. Through these schemes, BPD Units will have access to funds to (partly) support their operations and their clients' fund requirements. Besides, the growth of the BPD Units has also attracted the interest of VCs and social investors. Work still remains to be done in this segment, but as of now, the BPD Units will be able to continue operations for at least another year.

Another area that has been explored by ABI-ICRISAT involves that of the possibility of registering the BPD Units as a Section 25 entity so as to derive the benefits that accrue to such entities and to pass on such benefits (especially tax breaks) to the start-ups.

Human resource and capacity building

Having adequate and quality manpower equipped to handle the many issues that can arise in the agri-business domain is a vital activity for the handholding partner. ABI-ICRISAT took steps to address this from the start, beginning by developing ToRs for the staff, work allocation, selection of business manager and staff members, and later conducting capacity building programs every year on all business incubation related activities with experts from the field. Apart from this, online seminars were held to keep capacity building activities running throughout the year. The annual Global Agribusiness Incubation Conferences organized by ABI-ICRISAT for the NAIP also addressed new areas of entrepreneurship, technologies and modes of incubation.

Exposure visits were also held for business managers and Consortium Principal Investigator and officials of NAIP and ICAR to observe the operations in other successful incubator models and interact with incubation professionals in India and abroad such as the *info*Dev Global Forum at Finland and South Africa, Cornell University, USA, and EMRC Agribusiness Forum. This helped the personnel to further appreciate the work expected from them and to modify the incubator business plans accordingly so as to ensure it is able to support their clients to the best extent possible.

A key aspect of enhancing motivation levels within the incubator was the concept of recognizing people's efforts and rewarding them. The NIABI Best Agribusiness Incubator Award given out to the best performing BPD Unit every year was institutionalized with this in mind, and each year has seen the competition amongst the BPD Units intensifying. The Units are assessed on various parameters by an expert panel

comprising of incubation professionals, industry and academia. The BPD Unit of TNAU was adjudged the winner of the first NIABI Best Agribusiness Incubator award while ZTM-BPD Units of the Indian Agricultural Research Institute (IARI) and the Indian Veterinary Research Institute (IVRI) won it in 2012. In 2013, the ZTM-BPD Unit of the Central Institute of Fisheries Technology (CIFT) took the honours.

ABI-ICRISAT also recognised successful start-ups that were incubated by the BPD Units. This helped in boosting the morale of the existing ventures within the network and aided in their growth. Towards this, ABI-ICRISAT initiated NIABI Best Agribusiness award to recognise outstanding clients of the BPD Units. The first award under this category was won by M/s Emral Tune-Line Tech, client of BPD Unit, TNAU in 2011 while M/s Sulthan Fish Feeds and All India Development Trust clients of ZTM-BPD Unit of CIFT and IVRI respectively won it in 2012. Kemrock Agritech Private Limited, client of BPD Unit of AAU won the award for the year 2013. The BPD Units are also encouraged to apply for various annual awards given by different agencies and some of them, such as the BPD Units of AAU, IVRI and IARI, have won accolades.

Networking

Networking remains a vital link in the process of business incubation and ABI-ICRISAT has always ensured that networking platforms are effectively used by the BPD Units. NIABI was conceived as a nationwide network specifically catering to agri-business incubators and agri-business ventures to build synergy nationally and creating momentum for entrepreneurship and innovation in agriculture. Coordinated by ABI-ICRISAT, the NIABI is more virtual rather than onsite and this has helped in reaching out to a lot of budding entrepreneurs from urban areas of the country and in cross promotion of technologies across states. The NIABI also became a launchpad for the annual Global Agribusiness Incubation Conference series to create global awareness, building competencies on agri-business incubation within the entrepreneurial community, and establishing partnerships in agri-business sectors worldwide. The NIABI Annual conference strengthened the capacities of agri-business incubators by networking with policymakers and funding agencies for policy and financial support. The conferences have enlightened funding agencies and policy makers about NIABI and its potential to act as a means of reaching out to entrepreneurs and reinvigorating the sector. Furthermore, it has sensitized the research community in NARS about NIABI as a means to disseminate agri-technologies. The NIABI annual conference was thus a big step in understanding the finer details of agri-business and business incubation, thereby providing a focused, inclusive approach to revamp agricultural systems across the world.

To enhance the operations further, ABI-ICRISAT developed the Global Agri-Business Incubation (GABI) Network; this will provide additional networking opportunities and new markets for these BPD Units to operate.

Promotional activities

ABI-ICRISAT has been promoting the activities of the BPD Units through its participation in leading agri-exhibitions in India such as KISAN, Agri-INTEX and Agri-Tech. At most of these platforms, the BPD Units and their clients are promoted, which has helped in business development. Other traditional forms of promotional materials such as brochures, videos, and exhibition collateral were also developed and used.

The social media platform was also used extensively and most of the BPD Units have a presence in the e-world.

NIABI Nexus is a half-yearly newsletter that compiles all the activities and achievements of the BPD Units that is developed by ABI-ICRISAT. The newsletter is widely circulated amongst the key people in the agricultural sector – public and private – to keep them abreast of the developments within the network.

Monitoring and Evaluation

In terms of monitoring and evaluation, ABI-ICRISAT provided the incubators with a monthly report template, so as to keep track of their activities in every month. Apart from this, the performance indicators collected every six months by NAIP also provided insights on the performance of the incubators on different milestones. Along with regular visits to the BPD Units, these assessments were scored on different parameters and the progress of the incubator was observed.

Performance indicators

The performance metrics developed by ABI-ICRISAT evaluated the BPD Units on various indicators-systems, activity, physical targets and financial targets (Annexure 1). Each of these indicators has its own set of sub-indicators on which the incubators were evaluated, and scores provided based on performance against set parameters.

The data for the analysis was based on the Project Appraisal Document (PAD) indicators and periodic review meetings held by NAIP along with an intra-BPD assessment and by not comparing performance between BPD Units. Figure 6 shows the performance of the BPD Units, and shows how the first set of 10 BPD Units have been able to improve their scores over two-year period, by making interventions, with assistance from ABI-ICRISAT, that have helped them improve their performance and achieve their targets.

The scoring for each BPD Unit was done based on its achievements against the targets that were set for it during the start of operations. These targets were accepted by every BPD Unit in the initial meetings and have been followed every year and tracked during review meetings.

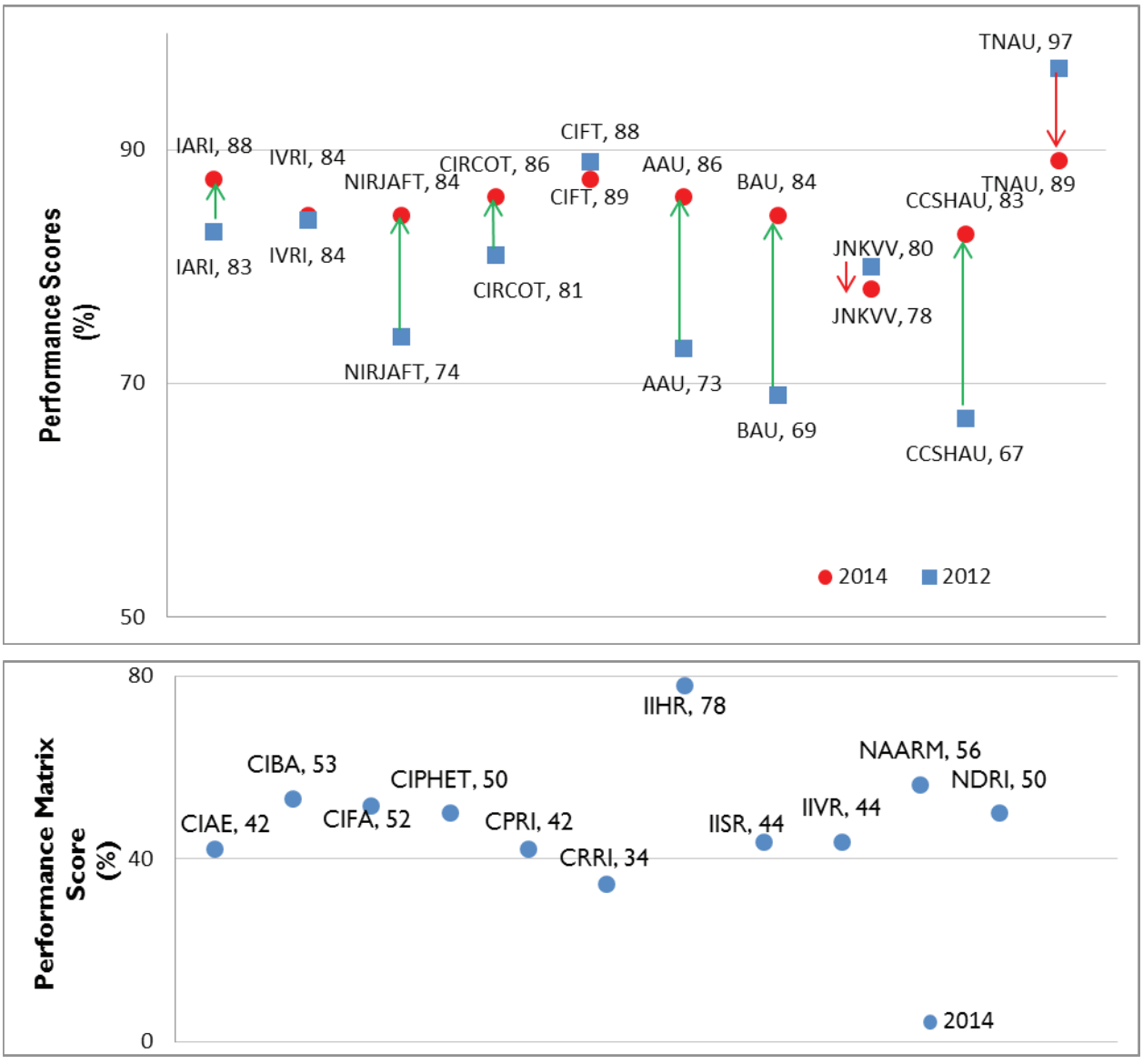
The scoring was based on performance of each BPD Unit and not by comparing the Units. The charts were only used to depict the scores in a better manner. None of the BPD Units were ranked in terms of their performance in the process.

The comparison between BPD Units cannot be done, considering that:

- Some of the BPD Units began operations in 2008, some in 2009 and the rest in 2013. It is possible that some of the initial ones could have gained a competitive advantage over the others thus rendering the comparison ambiguous.
- Of the lot, five BPD Units are from SAUs and the rest in ICAR institutions, which by itself allows for diversity and different nature of technology database and services that can be offered by each Unit.
- Location of the BPD Unit and sector of operation also needs to be considered for scoring as the entrepreneurial culture varies across cities in India; for example, Coimbatore has more of such a culture than Jabalpur. Animal vaccines may be able to generate higher revenue to the Unit than processed fish-product technologies and plant varieties.

- Each institute has its own mandate and administrative pattern that makes Systems implementation different and customized to suit the ground realties, such as accessibility to the technology database, scientists perception of the Unit, functional authority afforded to the Unit etc determine how well a Unit has been able to deliver results.
- The performance matrix has some subjective indicators that were evaluated and scored based on review meetings, onsite mentoring visits and monthly/annual reports.

Figure 6. Overall performance metrics score of BPD Units



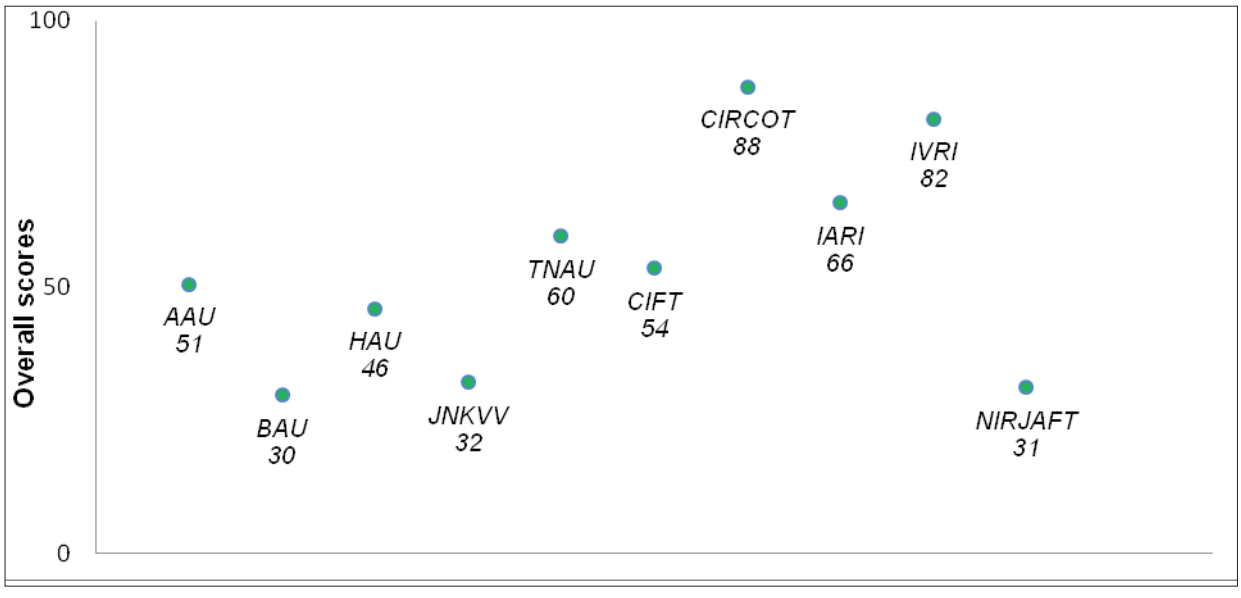
Source: BPD Data (September 2012; December 2013)

From a theoretical point of view, an analysis of the latest PAD indicator scores (Annexure 2) given by the BPD Units will show that the ZTM-BPD Unit of the Central Institute for Research on Cotton Technologies

(CIRCOT) will emerge as the best incubator among the first set of 10 BPD Units, while ZTM-BPD Unit of the National Institute of Research on Jute and Allied Fibre Technology (NIRJAFT) and BPD Unit of Birsa Agricultural University (BAU) are among the lowest (Figure 7).

Though this analysis does not consider the ground realties, such an exercise does provide a marker in terms of absolute performance. This helps the implementing and mentoring partners to identify and define new strategies to enhance operations of the poor performing BPD Units. Exclusive handholding visits and mentoring sessions were provided for the Units at NIRJAFT, BAU and Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV) to help them appreciate the role of the incubator in promoting the sector within the region. It also helped in resolving issues at the institute level.

Figure 7. BPD performance ranked on PAD indicators



Source: PAD Indicators of BPD Unit (March 2014)

Sustainability indicators

One of the roles entrusted with the handholding partner was that of helping the Units attain sustainability so as to continue their operations and service the clients, once the project ends.

To help in assessing the financial sustainability of the BPD Unit, a baseline figure (or burnout rate) was arrived at by calculating the manpower and operation cost that a Unit will incur to sustain its operations for a period of one year. As can be seen in Table 2, the amount differs for two categories of BPD Units in SAUs and ICAR Institutes, due to the differing operation costs.

Table 2. Burnout rates for BPD Units

Component *(cost in Rs million)*	BPD Unit (SAU)	ZTM-BPD Unit (ICAR Institute)
Manpower cost	**1.5**	**1.5**
Operations cost	**1.0**	**2.0**
Total	**2.5**	**3.5**

Source: BPD data

For a quick but critical assessment, the following slabs were developed based on the rates to highlight the position of the BPD Units:

>Burnout rate	>50% of Burnout rate	<50% of Burnout rate

Using data provided by the BPD Units, the revenue generated by each BPD Unit by way of transfer of technology (ToT), consultancy assignments, membership fees, training programs etc was calculated. As a rule of thumb, 30% of the overall revenue is expected to be retained by the Unit and considered as surplus fund. The fund was then compared against the respective burnout rates to assess the sustainability of the first set of 10 Units (Table 3). This exercise was done at every review meeting and presented to BPD Units and the NAIP team to help them plan ahead for the sustainability of the Unit.

Table 3. Sustainability of BPDs

(all amount in Rs Millions)	AAU	IVRI	TNAU	HAU	NIRJAFT	CIRCOT	CIFT	JNKVV	BAU	IARI	
Burnout rate	**2.5**	**3.5**	**2.5**	**2.5**	**3.5**	**3.5**	**3.5**	**2.5**	**2.5**	**3.5**	**Total**
Overall Revenue	5.95	69.21	4.74	16.41	1.54	10.28	9.27	7.90	16.2	81.55	**223.05**
Surplus (30% of revenue)	1.78	20.76	1.42	4.92	.46	3.09	2.78	2.37	4.86	24.47	**66.92**

Source: BPD data (February 2014).

ABI-ICRISAT also facilitated BPD Units in accessing additional projects and funding sources that were available through various schemes of the Government of India. It is estimated that projects worth Rs 233 million sourced from different Government agencies (table 4, page 57) is in the pipeline for these BPD Units.

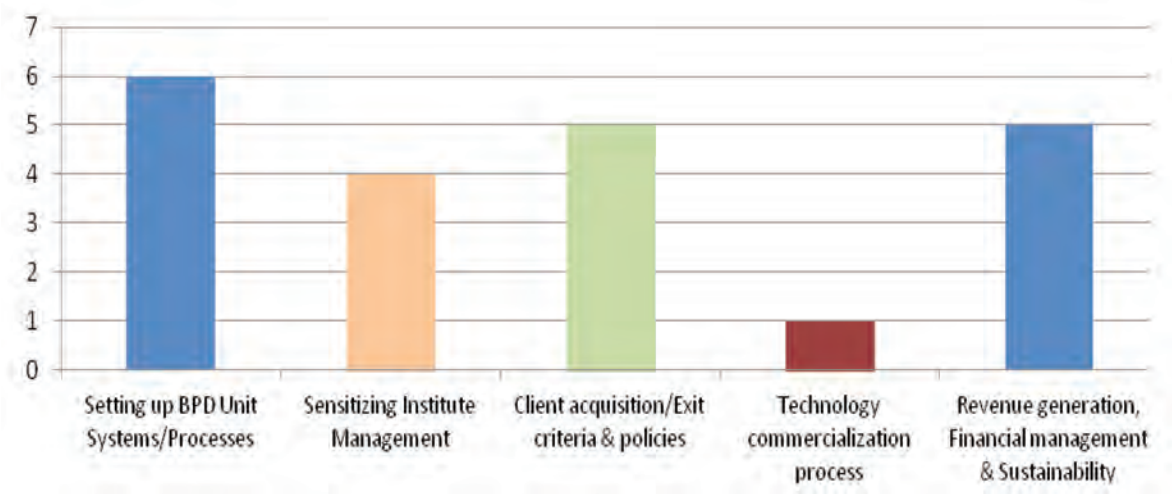
Feedback from BPD Units

Feedback from the BPD Units has often helped in fine-tuning the efforts put in by the ABI-ICRISAT and identifying newer areas of interventions that will help improve the performance of the Units.

ABI Program Support

In their feedback, the BPD Units indicated that the major support from ABI-ICRISAT was in setting up of their incubator and putting in place systems and processes. Key to the success of the BPD Unit was the sensitization work done by ABI-ICRISAT with the management of the Institute and in helping the Units get clients and understand revenue generation models (Figure 8). Technology transfer and its commercialization may need renewed focus by the program but the Units are governed by the ICAR Technology Transfer Protocols.

Figure 8. Response to ABI Program support

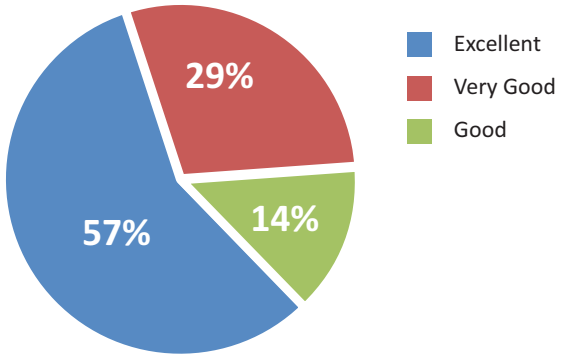


Source: BPD Unit Feedback (March 2014).

Feedback on ABI Team Response

More than 85% of the surveyed BPD Units found ABI-ICRISAT to be an effective handholding partner in addressing their needs and requirements (Figure 9). It shows the confidence the Units had with the Program and the belief that both entities were working towards the common goal.

Figure 9. Feedback on ABI team response

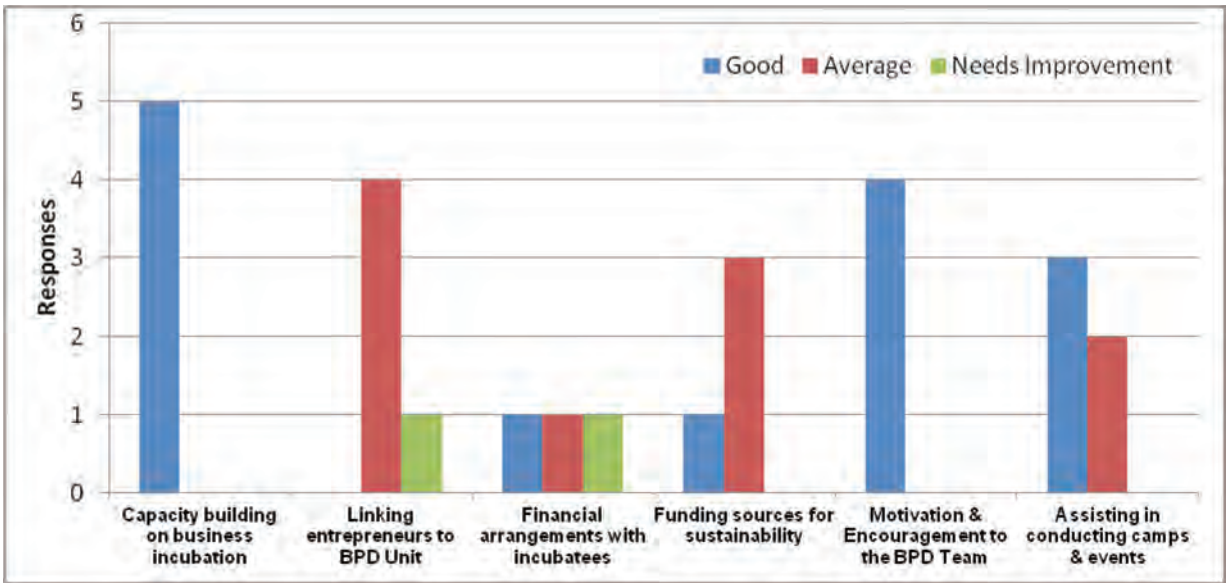


Source: BPD Unit Feedback (March 2014).

Specific incubator support services by ABI Program

The Units were also asked for feedback on some of the critical services that were provided to them by ABI-ICRISAT. Most of them felt they had benefited well from our interventions, as can be seen from Figure 10. As the handholding partner, ABI Program had given major thrust on capacity building programs through which it aimed to help the Unit on different aspects of the incubator domain. Key to success of the partnership has been the constant motivation and encouragement that was provided by the Program. While the Program has helped the Unit in getting new clients and access to funding sources, work needs to be done to enhance it further, at least in terms of guidance.

Figure 10. Response to incubator support services by ABI Program



Source: BPD Unit Feedback (March 2014).

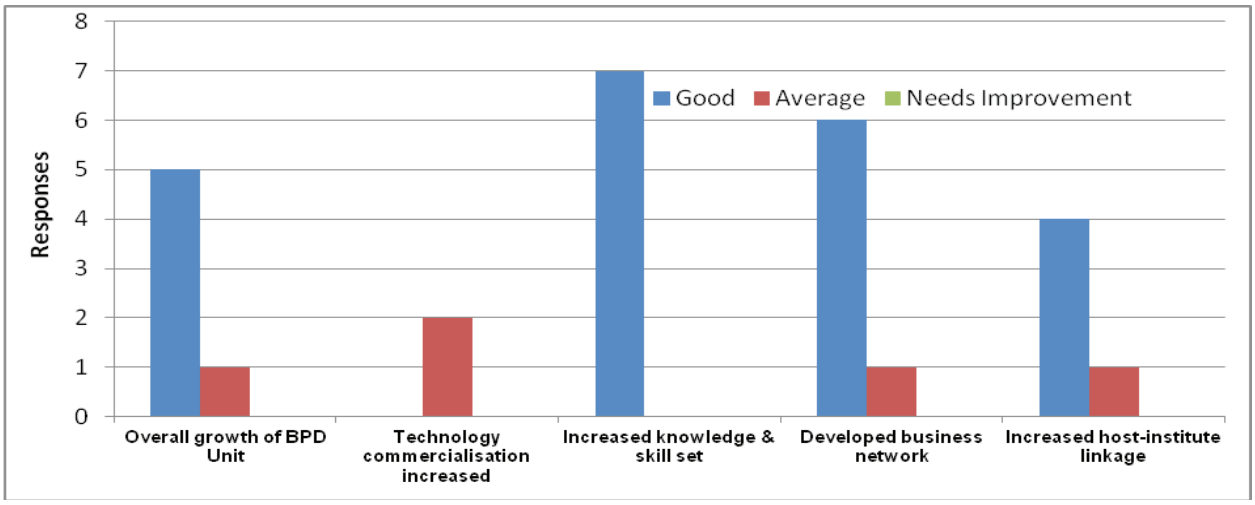
Benefits of partnering with ABI Program

On the whole, it was felt that the work done by ABI-ICRISAT had helped in enhancing the growth of the Unit (Figure 11). The BPD Units indicated that the interventions done by the program has helped in better integration between the Unit and the host institute, which has a major impact on the performance of the Unit and its daily operations.

Majority of them felt that there has been an increased sense of knowledge and skillsets within the BPD Unit team and an improvement in the rate of technology commercialization at the Institute level through the Unit, for which ABI-ICRISAT had provided training programs.

A key aspect of the scalability of the Unit has been an enhanced outreach and networking opportunities that were facilitated by the Program and which have been recognized by the BPD Units as one of the major benefits from this partnership.

Figure 11. Benefits of partnership with ABI Program



Source: BPD Unit Feedback (March 2014).

The role of the handholding and mentoring partner has been vital to the success of the BPD Units and helping the NARS adapt to the changes brought through by the incubation ecosystem. While some of the Units have been found wanting in terms of their performance, this will need additional support and guidance from the ICAR to fully realize its potential.

CHAPTER V : NAIP BPD UNIT PROFILES

This chapter provides a brief profile of each BPD Unit and what it can offer to aspiring agribusiness entrepreneurs and others in the value chain.

The BPD Units were provided with funding assistance through the NAIP, which helped them in creating infrastructure and assets such as pilot plants and laboratories to aid entrepreneurs. The initial set of BPD Units was located at five Zonal Technology Management and Business Planning and Development (ZTM-BPD) Units and five SAUs, while now the number has increased to 17 ICAR Institutions and five SAUs. This section provides an overview of the sector to which the BPD unit caters, as well as information related to the infrastructure, top technologies and achievements of the incubator. The overall performance and results will be provided in the next section.

Although the BPD Units are representing different institutions operating in different sectors, they all offer the following generic set of services to the potential entrepreneur. It is to be noted that these services are not limited to this list and that the BPD Units (just like any other incubator) has the flexibility to add new or modify existing services to suit the need of the entrepreneur, as long as it is within the mission of the Institute/University.

The generic set of services offered by a BPD Unit includes:

- One-stop solution for entrepreneurs through technology and scientific backstopping aided with operational support
- Support and services covering agriculture and allied sectors
- Regional presence as a reach-out strategy
- Pool of technologies that can be commercialized
- Mentoring, support and access to infrastructure facilities
- Technology and consultancy services
- *Plug & Play* model
- Access to high-end equipment for biotechnology ventures
- Conference and meeting rooms with AV systems including videoconferencing facilities
- Facilitation of funding for sustainability
- Capacity building for start-up team
- Onsite/Offsite incubation facility
- Marketing and business development

ZTM-BPD Unit, Central Institute of Fisheries Technology, Cochin

Operational since	29 August 2009		
Sector	Fisheries		
Address	ZTM-BPD Unit, CIFT, Willingdon Island, Matsyapuri P.O., Cochin-682 029, Kerala.		
Telephone No.	0484-2666845		
E-mail	naipcift@gmail.com		
Website	www.agriincubator.com		
Infrastructure	***Office space*** 5000 sq ft	***Laboratory space*** 210 sq ft/client	Conference room, 3 pilot plants, test beds

Top technologies for commercialization

- Chitin-Chitosan
- Retort pouch fish products
- Coated fish products
- Effluent Treatment Plant
- Extruded Fish Products

WINNER OF THE NIABI BEST INCUBATOR AWARD FOR 2013

Successful clients

- Quebec Biotech International Pvt. Ltd, brand: Flavour Spellz
- M/s Monsoon Bounty Seafoods Pvt. Ltd, brand: Monsoon Bounty
- M/s Ideal Foods and Caterers, brand: Freedom Kitchen
- M/s Sultan Seafood Court, brand: Fish Bite
- M/s Oceorganic Ventures Pvt. Ltd, brand: Pescado
- M/s Baigai Marine Foods, brand: Meenootty
- M/s Green Allies Organics Pvt., Ltd., brand: Vitagreen
- M/s Charis Food Products, brand: Prawnoes

Achievements and Impacts

- Awarded a Certificate of Appreciation from NAIP-ICAR in 2012 for the outstanding work on Establishment of Business Incubation Centre and Commercialization of Technology in Fish Processing
- Winner of NIABI Best Agribusiness Incubator, 2013
- State-of-the-art incubation office complex that can accommodate nine clients onsite
- FSSAI approved pilot plant facility with process lab
- Commercialized various fish processing based technologies
- Outlook for post-project sustainability remains good
- Incubatees have won export orders and accolades at national agri-events

ZTM-BPD Unit, Central Institute for Research on Cotton Technology, Mumbai

Operational since	19 November 2009		
Sector	Cotton technologies		
Address	ZTM-BPD Unit, CIRCOT, Adenwala Road, Matunga, Mumbai - 400 019, Maharashtra		
Telephone No.	022 2414 3718		
E-mail	bpd.circot@gmail.com		
Website	www.bpdcircot.com		
Infrastructure	***Office space*** 300 sq ft	***Laboratory space*** -	Lab and QC facilities available for incubatee

Top technologies for commercialization

- GINERP software
- Particle board
- Kawabata testing and analysis
- Nanocellulose production
- Technology for absorbent cotton
- Technology on eco-friendly dyes

Successful clients

- M/s. Bajaj Steel Industries Limited
- M/s. Precision Tooling Engineering
- M/s. Trytex Machine Company
- Shri Prakash Rathi, M/s Rathi Chemicals
- M/s. Millenium Rubber Technologies P Ltd.

BEST PERFORMING NAIP BUSINESS PLANNING AND DEVELOPMENT UNIT FOR TECHNOLOGY COMMERCIALIZATION AWARD AT THE AGRI-TECH INVESTORS MEET, JULY 2013

Achievements and Impacts

- Successfully marketed CIRCOT Calibration Cotton Standard for calibrating sophisticated cotton testing equipment, like High Volume Instrument (HVI) in India against stiff competition from the USDA standard, thus saving valuable foreign exchange.
- Commercialized 30 technologies and generated revenue of more than Rs 10 million; supported more than 120 entrepreneurs and incubated 15 of them; organized 30 events for entrepreneurs, undertook 29 consultancy agreements and filed 52 patents.

ZTM-BPD Unit, Indian Agricultural Research Institute, New Delhi

Operational since	01 January 2009		
Sector	Agriculture, agriculture biotechnology, farm machinery, crop and plant varieties and postharvest technology		
Address	ZTM-BPD Unit, IARI, Pusa Campus, New Delhi-110012		
Telephone No.	01125843542		
E-mail	zonaltech@gmail.com; zonaltech@iari.res.in		
Website	www.ztmbpd.iari.res.in		
Infrastructure	***Office space*** 900 sq ft	***Laboratory space*** 900 sq ft	Conference room, green house, polyhouse

Top technologies for commercialization

- Rice varieties
- Biofertilizers
- Nutraceutical concentrates
- Nanosulphur
- Vegetable and fruit varieties and processed products

Successful clients

- M/s Abu Biotech
- KAD Bio resources Pvt Ltd
- Farm Flux
- Krishna Pickles
- Sai Bio-Organics
- BeejIndia Producers' Company Limited

WINNER OF THE NIABI BEST INCUBATOR AWARD FOR 2012

Achievements and Impacts

- 87 diverse technologies commercialized to 118 companies
- 424 corporate members have been registered with Unit
- 71 seed varieties commercialized to seed companies like wheat variety HD 2967, HI 1544 HI1563, Rice variety PRH10, PB1509, Maize variety PHEEM5, several vegetable and flower varieties.
- Commercialization of bio-fertilizer technologies has led to creation of direct employment for approximately 2500 individuals.
- At least 30,000 farmers have benefited by getting quality inputs through BPD Unit clients.
- About 250 people per technology are likely to get employment when postharvest technologies related product comes into the market.

ZTM-BPD Unit, Indian Veterinary Research Institute, Izatnagar

Operational since	12 May 2009		
Sector	Animal husbandry, veterinary vaccines and diagnostics, value-added meat technologies, animal feed technologies		
Address	ZTM-BPD unit, IVRI, Izatnagar- 243 122, Bareilly, Uttar Pradesh		
Telephone No.	0581-2300207		
E-mail	drpuneet2006@gmail.com; puneetkumar@ivri.res.in		
Website	www.ivri.nic.in/ztmbpd		
Infrastructure	***Office space*** 625 sq ft	***Laboratory space*** -	12 incubator labs available

Top technologies for commercialization

- Peste des Petites Ruminants
- Vero cell based Sheep Pox vaccine
- Detection of L. Monocytogenes in milk
- Parentage verification kit for buffaloes, zebu cattle, camels and other ruminant livestock species
- Functional chicken nuggets

Successful clients

- All India Development Trust
- M/s Payas Agro
- Cross Bred Cattle Farm of Mr. Satwant Singh
- Sahiwal Dairy Farm of M/S Agrawal Milkies
- Royal Food Corporation
- S.N. Goat Farm of Mr. Aslam Javed

WINNER OF THE
NIABI BEST INCUBATOR AWARD FOR 2012

Achievements and Impacts

- 23 incubatees graduated
- Mobilized Rs 1.8 million for the incubatees
- 76 consultancy assignments undertaken
- 1354 farmers directly benefited from the value addition
- 17,445 local employment opportunities were generated directly by the incubatees
- Incubatee of BPD unit, AIDT, was winner of the NIABI Best Agribusiness Incubatee Award for 2012.

ZTM-BPD Unit, National Institute of Research on Jute and Allied Fibre Technology, Kolkata

Operational since	12 May 2009		
Sector	Jute and allied fibres		
Address	ZTM- BPD unit, NIRJAFT, 12, Regent Park, Kolkata – 700040, West Bengal		
Telephone No.	033-24714812		
E-mail	a_n_royin@yahoo.co.in		
Website	www.nirjaftbpd.in		
Infrastructure	***Office space*** 646 sq ft	***Laboratory space*** 1057 sq ft	Pilot plant of 306 sq ft

Top technologies for commercialization

- Jute based handmade paper, designer bags, decorative yarn, handloom fabric
- Jute stick particle board
- Tomato seed variety Swarna Sampada
- Brinjal seed variety Swarna Shakti
- Wine from litchi fruits

Successful clients

- Eco- Dev Consultancy Private Limited
- Kalighat Society for Development Facilitation
- Tru Blu International
- RBM Industries Limited
- G M Agro Allied Private Limited
- Sabuj Shakti Agro Revolutions Private Limited
- Sudharma Krishi Consultants Private Limited
- Fulia Women and Youth Welfare Society

JUTE BASED PRODUCTS DEVELOPED BY ZTM-BPD UNIT, NIRJAFT

Achievements and Impacts

- Establishment of pilot plant successfully completed for providing incubates facilities to manufacture jute stick particle board, handmade paper and decorative jute fabric.
- Facilitated nine ventures related to value-added products from jute amongst women and unemployed youth groups.

BPD Unit, Anand Agricultural University, Anand

Operational since	05 October 2009		
Sector	Agriculture, dairy, veterinary, food processing technology and bioenergy, agribusiness management, information technology		
Address	BPD unit, AAU, Anand-388001, Gujarat.		
Telephone No.	02692-260211		
E-mail	rajababuvyas@gmail.com, rvvyas@aau.in		
Website	www.aau.in		
Infrastructure	***Office space*** 415 sq ft	***Laboratory space*** 30,271 sq ft	Fermentor, distillation units, lab equipment

Top technologies for commercialization

- Liquid biofertilizer technology
- Date palm tissue culture
- Probiotic lactic culture MTCC 5463
- Area specific mineral mixture
- Biodiesel production for Jatropha

Successful clients

- Kemrock Agritech Private Limited
- Gujarat State Fertilizers and Chemicals (GSFC) LTD.
- Gujarat Agro Industries Corporation (GAIC) LTD.
- Dr. Baboo's Food Science and Biotechnology Pvt. Ltd.
- Orchem Industries Pvt.Ltd.

BPD UNIT AAU RECOGNIZED AT DIFFERENT FORUMS

Achievements and Impacts

- Renovated four technology pilot plants, namely liquid biofertilizers, area specific mineral mixture, biodiesel processing plant and traditional Indian dairy products manufacturing plant at AAU with incubation facility on respective premises.
- Times of India JP Morgan Social Impact Award for Lab to Land and Commercialization of Liquid Biofertilizers Technology
- NAIP-ICAR Certificate of Appreciation for development and commercialization of liquid biofertilizers technology
- FGI Award of Excellence for Best Developmental Work in Agriculture (Liquid Biofertilizers)
- Client of BPD unit, Kemrock Agritech was winner of the NIABI Best Agribusiness Incubatee Award for year 2013

BPD Unit, Birsa Agricultural University, Ranchi

Operational since	09 October 2009		
Sector	Agriculture, Animal husbandry		
Address	BPD Unit, BAU, Kanke, Ranchi – 834 006, Jharkhand		
Telephone No.	0651-2450060		
E-mail	dsfbau@rediffmail.com		
Website	www.bauranchi.org		
Infrastructure	***Office space*** 3000 sq ft	***Laboratory space*** -	Common business centre, Feed plant

Top technologies for commercialization

- Black Bengal X Beetle Goat Breeding farm technology
- Poultry processing unit

Successful clients

- M/s Lucky Charm Poultry Pvt Ltd
- Seed Business Incubation Programme at Govindpur (Dhanbad)
- Seed Business Incubation Programme at Upparsholi, East Singhbhum
- TeFFe's Retail outlet Chain

CLIENT OF BPD UNIT, BAU DEMONSTRATING HIS IDEA TO THE VICE CHANCELLOR, BAU

Achievements and Impacts

- Enhancement of farmers' lives due to increased income generation by adopting new technologies and practices of improvised farm production through higher yield
- Thirty entrepreneurs/NGOs were provided with consultancy and marketing assistance
- Four seed business ventures were successfully incubated
- BPD Unit has helped in commercialization of BAU technologies

BPD Unit, Chaudhary Charan Singh Haryana Agricultural University, Hisar

Operational since	10 February 2010		
Sector	Agriculture, crop and plant varieties, agri-biotechnology, food processing and postharvest, farm engineering and machinery		
Address	BPD unit, CCS HAU, Hisar-125004, Haryana		
Telephone No.	01662-289532		
E-mail	bpdccshau@gmail.com		
Website	www.hau.ernet.in/hrm/bpd/bpd.htm		
Infrastructure	***Office space*** -	***Laboratory space*** 9 labs	APE Workshop

Top technologies for commercialization

- Maize hybrids
- Milk urea detection kit
- Wheat varieties
- Schizont Cell Culture Vaccine against bovine topical Theileriosis
- Liquid biofertilizers

Successful clients

- Mr. Anurag Sharma, Healthy Bites DKS Incorporate
- Mr. Manoj Kumar, Y.S. Sons AGROTECH
- Mr. Shubh Karan Kamboj

Achievements and Impacts

- More than 130 technologies identified for commercialization.
- 10 patents granted for technologies.
- Two technologies (Milk Urea kit and Rice Hybrid HKRH 1) brought into market resulting in national recognition.
- 76 entrepreneurs/ companies/ NGOs have been registered for training and incubation and it brought awareness among the people.

MAIZE HYBRIDS ON DISPLAY

MOU EXCHANGE FOR TECHNOLOGY TRANSFER

BPD Unit, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur

Operational since	09 October 2009		
Sector	Agriculture, seeds, farming systems		
Address	BPD unit, JNKVV, Adhartal, Jabalpur-482004 Madhya Pradesh		
Telephone No.	0761-2903544		
E-mail	skrao_jnau@yahoo.co.in		
Website	www.jnkvv.nic.in		
Infrastructure	***Office space*** 2400 sq ft	***Laboratory space*** -	Lab facilities with various departments

Top technologies for commercialization

- Hybrid rice JRH-5
- Hybrid rice JRH-8

Successful clients

- Hari Om seeds
- Mahindra & Mahindra Ltd (Farm division)
- Krishi Seva Kendra
- Jabalpur Agri-Producer Company Limited (JAPCL)
- MP Seed Federation

Achievements and Impacts

- Facilitated partnership between Jabalpur Agri-Producer Company Limited (JAPCL) and Hindustan Insecticides Limited (HIL) that helped the former increase turnover by more than Rs 60 million in two years.
- Promoted the entrepreneurs by providing them full support. Ashish Patel of Krishi Sewa Kendra, an entrepreneur in Damoh District of Madhya Pradesh, started marketing biofertilizers and bio-control agents of JNKVV and now has a turnover of Rs 1.5 million.

TECHNOLOGIES OF JNKVV READY FOR COMMERCIALIZATION THROUGH BPD UNIT

BPD Unit, Tamil Nadu Agricultural University, Coimbatore

Operational since	09 October 2009		
Sector	Agriculture, Food processing, seed, farm machinery, bio-input, agri-biotech, innovative ventures		
Address	BPD unit, TNAU, Coimbatore - 641 003, Tamil Nadu		
Telephone No.	0422-6611377		
E-mail	business@tnau.ac.in		
Website	www.bpdtnau.org		
Infrastructure	***Office space*** 3000 sq ft	***Laboratory space*** 650 sq ft	Full-fledged lab, common business center

Top technologies for commercialization

- TNAU- Insect Egg Removal Device
- Milky and Medicinal Mushroom
- Sugarcane Booster
- Solar Crop Drier
- TNAU Coconut Tonic
- TNAU Master Trap
- Liquid Bio-fertilizer
- TNAU Bio-mineralizer
- Herbal Insect Repellant

WINNER OF THE NIABI BEST INCUBATOR AWARD FOR 2011

Successful clients

- M/S Emral Tune Line Auto Tech Ind
- M/S Bright Indian Organic Hi-Tech
- M/s Provimi Products Pvt Ltd
- M/S Eco Green Unit
- M/S Sp Engineering Pvt Ltd
- M/S Coronet Food
- M/S Vinzi Sperri Pvt Ltd
- M/s J.K.Foods

Achievements and Impacts

- Platform created for easy access of University technologies under single window system, scientific validation of innovations through expert guidance, assistance for patent filing, support for market information and linkage, skill-oriented training, capacity building, management development programs and funding assistance through financial institutions.
- Successfully facilitated the design and fabrication of a Banana Fibre Threading machine.
- Mr Rajkumar of Emral Tune Line Tech was the first winner of the NIABI Best Agribusiness Incubatee Award for 2011.
- Developed automation system for M/s Provimi Products Pvt Ltd., and bagged orders worth Rs 8 million from the Government of Tamil Nadu.

HTM-BPD Unit, Indian Institute of Horticultural Research, Bengaluru

Operational since	11 May 2013
Sector	Horticulture, fruits, vegetables, floriculture, medicinal and aromatic plants
Address	HTM-BPD Unit, IIHR, Hessaraghatta Lake Post, Bengaluru – 560089, Karnataka
Telephone No.	080 - 28466420-23 Ext: 263
E-mail	sudham@iihr.ernet.in
Website	www.iihr.ernet.in

Top technologies for commercialization

- Mass production technology for biopesticides
- Ready-to-serve juice of amla, jackfruit, kokum and banana
- Tomato crush technology
- Vegetable varieties
- Osmotically dehydrated mango, papaya and fruit bar technology

Successful clients

- M/s Krishi Biosys
- M/s Madhavi Foods
- M/s Divine clique foods
- M/s Hi7agribio solutions
- M/s Natural Remedies

LAUNCH OF HTM-BPD UNIT, IIHR

Achievements and Impacts

- Total enrolment of 70 members representing different membership categories, earning the BPD membership revenue of Rs 0.214 million.
- HTM-BPD unit incubated its first tenant client on 7 September 2013 for scaling up production of six biopesticides from 1 ton to 10 tons, through its handholding and incubation services.
- M/s Natural Remedies, in collaboration with Odisha Agricultural University, successfully developed three products/processes. The timely intervention by the HTM-BPD helped the client in reducing the production process to 4 hours from their earlier effort of 12 hours; helped bring down their production costs and modified the production process for commercial scale.

BPD Unit, Central Institute of Agricultural Engineering, Bhopal

Operational since	21 May 2013
Sector	Agricultural engineering, farm mechanization and agro produce-processing and value addition
Address	BPD unit, CIAE, Nabibagh, Berasia Road, Bhopal- 462 038, Madhya Pradesh
Telephone No.	0755-2521133/34
E-mail	pcbargale@ciae.res.in
Website	www.ciae.nic.in

Top technologies for commercialization

- Process technology for multi nutrient composite mix for biscuits
- Self-propelled multipurpose hydraulic lift system (for orchard operations)
- Arecanut sheath shredder

Successful clients

- M/s KGVK Agro Ltd.
- Shri Punit Singh Kanojiya
- M/s Bio Nutrients (India) Pvt. Ltd

Achievements and Impacts

- Three technologies commercialized
- Promoted various entrepreneurship development and capacity building programs
- Various interaction meets / workshops / conferences organized
- Filed for two patents and two copyright applications

BPD UNIT TEAM OF CIAE, BHOPAL

BPD Unit, Central Institute of Freshwater Aquaculture, Bhubaneswar

Operational since	June 2013
Sector	Fisheries, Freshwater aquaculture
Address	BPD Unit, CIFA, Kausalyaganga, Bhubaneswar- 751002, Odisha
Telephone No.	674-2468616
E-mail	bpd.cifa@gmail.com
Website	www.cifa.in; www.bpdcifa.com

Top technologies for commercialization

- Portable FRP Carp Hatchery, FRP Magur Hatchery
- Immunoboost-C
- CIFABROODTM
- Value added fish product like Rohu and Catla deboned fish, fish fingers, fish pickle, fish fillet, fish biriyani, fish pickle

CIFA TECHNOLOGIES ON DISPLAY

Successful clients

- M/s Aisharya Aquaculture Pvt. Ltd. Naihati (WB)
- M/s M R Aquatech, BBSR
- M/s Smruti Agency, BBSR
- M/s Prabhakar fish pickle, BBSR
- M/s Kesar sweet water fish product, Bhubaneswar
- M/s Poonam Fisheries
- M/S Gugly Centre for Biological Research

Achievements and Impacts

- Created office space and construction of technology park is underway
- Three freshwater ponds created for onsite training to entrepreneurs
- Developed freshwater fish processing unit. The unit developed products like fillet, finger, nugget, drumstick, and breaded and battered products. Freshwater fish pickle was another innovative product designed during the period and developed from Rohu, Catla, Murrel and Tilapia fishes. The developed products are being sold in the Reliance Fresh supermarket in Bhubaneswar city on an experimental basis.
- Two products, Rohu whole fish and Tilapia drumstick, were launched in the Pune market. The response was good and the supplier got repeat purchase orders for all the products.
- Fish hydrolysate is developed from fish waste in BPD Unit; the product is high in various nutrients and can be applied as foliar spray in fruits/vegetables and can also be used in tanks for plankton promoter. This product was tested in OUAT and CIFA lab to evaluate its nutrient value.

BPD Unit, Central Institute of Brackishwater Aquaculture, Chennai

Operational since	29 May 2013
Sector	Fisheries, brackish water aquaculture
Address	BPD unit, CIBA, 75, Santhome High Road, R. A. Puram, Chennai–600028, Tamil Nadu
Telephone No.	044- 24610565
E-mail	ravisankar@ciba.res.in
Website	www.ciba.res.in

Top technologies for commercialization

- pH and DO Kit
- Microanalysis kit for ammonia and nitrite
- Asian Seabass seed production technology
- CIBA shrimp feed technology
- CIBABA-1: Bacterial strain for development of bio augmenter
- CIBAX-1: Matrix for immobilization and imaging of bacteria
- Biosorbent for removal of heavy metals
- β- Nova RT PCR kit
- CIBA Bhetkiahar
- Immunodot technology for detection of WSSV
- Kit for the detection of WSSV

MOU EXCHANGE THROUGH BPD UNIT, CIBA

Successful clients

- M/s. Suryofoods
- M/s. Ratna Agro-Vet Feeds India Pvt Ltd.
- M/s. Tayo Matsya Super Feeds Pvt Ltd
- Agency for Development of Aquaculture (ADAK)
- M/s Poseidon Biotech
- Rajshree Sugars Pvt Ltd
- M/s. Laxminarayan feeds

Achievements and Impacts

- Consultancy/Technology transfer on Asian Seabass hatchery
- Collaborative research program on seed production of mud crab, Scylla serrata
- Consultancy services for feed plant and machineries and stocks of raw materials, finished goods and other current assets
- Cost-effective shrimp and fish processing technology
- Transfer of CIBASTIM technology

BPD Unit, Central Rice Research Institute, Cuttack

Operational since	31 May 2013
Sector	Agriculture, rice-based farming production systems
Address	BPD Unit, CRRI, Cuttack -753006, Odisha
Telephone No.	09437484576
E-mail	gak.kumar26@gmail.com
Website	www.crri.nic.in

Top technologies for commercialization

- Hybrid rice seed production
- HYV rice seed production
- Rice implements manufacturing
- Rice-fish Integrated farming system (This also includes technologies from fisheries, horticulture, tuber crop, poultry, goat rearing, apiculture, rice)
- Biopesticide production
- Bio-fertilizer production

Successful clients

- Mr. Chinmayee Mohanty
- Mr. Rabinarayan Mohapatra
- Dr. Satya Sundar Sahu
- Mr. Kedar Swain

Achievements and Impacts

- Integrated rice fish farming in Padmapur and Kalarahathi villages of Ersama block, Jagatsingpur District has helped in generating differential profit of about Rs 40,000 per ha.

FIELD VISIT SUPPORT BY BPD UNIT, CRRI

BPD Unit, National Academy of Agricultural Research Management, Hyderabad

Operational since	21 May 2013
Sector	Agricultural Research and Management
Address	BPD Unit, NAARM, Rajendranagar, Hyderabad- 500030, Telangana
Telephone No.	040-24581304
E-mail	kalpana@naarm.ernet.in
Website	http://bpd.naarm.org.in

Top technologies for commercialization

- Rice bran based health products
- Jowar based food products like multigrain atta, flakes, biscuits etc.
- Dyeing cotton with natural dyes
- Block printing technology

Successful clients

- Dia Vikas Capital
- NexFarm Pvt. Ltd
- M/s Mallaiah Sweets
- Vegetable hand block Kalamkari printers welfare association
- Palle Srujana

Achievements and Impacts

- Established BPD unit, identified ICAR/SAU technologies and developed database and information and knowledge tools
- Initiated training need assessment study
- Created website
- IP and technology valuation initiatives
- Capacity building initiatives
- Provided support for technology commercialization and entrepreneurship activities
- Began foresight and governance studies
- Developed case studies for eight sectors

PROMOTING SMEs IN AGRICULTURAL SECTOR

BPD Unit, Central Plantation Crops Research Institute, Kasargod

Operational since	21 May 2013
Sector	Horticulture, Food processing and post-harvest management, farm engineering and machinery, agro inputs, cultivars and varieties, cultivation practices
Address	BPD Unit, CPCRI, Kasaragod-671124, Kerala
Telephone No.	04994-232895
E-mail	kmurali.cpcri@gmail.com
Website	www.cpcri.gov.in

Top technologies for commercialization

- Virgin coconut oil (two methods: hot processing and fermentation)
- Coconut kernel based products (coconut chips, desiccated coconut, etc)
- Value addition by-products: Coconut water based beverages and vinegar; defatted coconut meal based products
- Activated carbon from coconut shell
- Coconut shell powder
- Coconut milk

VALUE ADDED & CROP RELATED TECHNOLOGIES FOR COCONUT

Successful clients

- Global Associates
- Shreekalpa Industries
- ESellZone.Com
- Mohd. Sinan
- P. Nagendra Babu

Achievements and Impacts

- India's first coconut Business Incubator under NAIP-ICAR, in Public Private Partnership (PPP) mode was set up at Pollachi.
- Two awareness camps on various coconut technologies and value added processing were organized.
- One of the incubatees was successful in utilization of steam instead of thermal liquid in the cooker during production of virgin coconut oil, which helped bring down the temperature of the VCO cooker immediately, resulting in colorless oil.
- Another incubatee was successful in use of biopreservative for a packaged coconut water beverage.
- One incubatee received export order from Italy worth Rs 1 million and another is awaiting the Letter of Credit from the buyer.

BPD Unit, National Dairy Research Institute, Karnal

Operational since	21 May 2013
Sector	Animal husbandry, dairy technologies
Address	BPD Unit, NDRI, Karnal- 132001, Haryana
Telephone No.	0184-2259291
E-mail	aksndri@gmail.com
Website	www.bpdndri.com

Top technologies for commercialization

- Bajra lassi
- Bajra biscuit
- Low cholesterol ghee
- Whey tomato
- Jaljeera whey drink
- Long shelf life paneer
- Test for detergent detection of milk
- Antibiotic kit

DAIRY TECHNOLOGIES AT NDRI, KARNAL

Successful clients

- Veerdeepika Pvt. Ltd
- Shri Shivani Agro Ltd.
- Aviva Dairy Farm
- Aggarwal Milkies
- Kamdhenu Milk Producer's Union
- Agathi Healthcare Pvt. Ltd.

Achievements and Impacts

- Five technologies commercialized
- Four entrepreneurs incubated/enrolled
- 331 entrepreneurs supported/ trained
- Four client servicing (commitment/delivered)
- Rs 257,900 revenue generated for the BPD
- Four consultancy assignments undertaken
- 90 farmers directly benefited with value addition

BPD Unit, Indian Institute of Spices Research, Kozhikode

Operational since	21 May 2013
Primary Sector	Horticulture, spices
Address	BPD Unit, IISR, Kozhikode- 673012, Kerala
Telephone No.	0495-2731302
E-mail	jayasree@spices.res.in
Website	http://www.spices.res.in

Top technologies for commercialization

- Plant varieties (turmeric, ginger, black pepper, cardamom, nutmeg, cinnamon)
- Novel method for storing and delivering PGPR/microbes through biocapsules
- Micronutrient mix for spice crops
- Seed coating technology for seed spices
- Biocontrol agent- Trichoderma, Pochonia
- Diagnostic for viruses infecting black pepper and cardamom
- Microbial consortium for black pepper- Talc formation
- PGPR Talc formulation- Ginger
- Rapid multiplication of disease-free planting material in ginger, turmeric and black pepper-plug trays

Successful clients

- Mr. Abdul Nabeel
- Mr. Abdul Latheef
- NHRDF

Achievements and Impacts

- One technology has been commercialized while 17 entrepreneurs are being supported by the unit with eight consultancy assignments being undertaken.
- Six patent applications have been filed and the BPD unit has generated Rs 0.352 million in revenue so far.

BPD UNIT TEAM OF IISR, KOZHIKODE

BPD Unit, Central Institute of Post-Harvest Engineering and Technology, Ludhiana

Operational since	17 May 2013
Sector	Agricultural engineering, agro-processing and value addition
Address	BPD Unit, CIPHET, P.O: P.A.U, Ludhiana-141004, Punjab
Telephone No.	0161-2313123
E-mail	bpdciphet@gmail.com; kadam1k@yahoo.com
Website	www.ciphet.in

Top technologies for commercialization

- Pearl millet based composite extrudates and pasta technology
- CIPHET cryogenic spice grinding system
- Ginger processing technology
- CIPHET tomato grader
- Cryogenic grinder

Successful clients

- Mr. Siddarath Agarwal
- M/s. Radiant Entreprises
- Mr. Baldev Singh
- Mr. Mohan Singh
- Mr. Rakesh Thapa
- S. Jagtar Singh

Achievements and Impacts

- Based on CIPHET developed technology, M/s Spectra Cryogenic, Rajasthan has started fabrication of CIPHET Cryogenic spice grinding system.
- Based on CIPHET developed technology of mechanized system for popping and decortications of makhana seeds, M/s Jwala Engineering and Consultancy Services, Ambala has started commercial production/fabrication of machines.
- From the sub-project, the unit has so far generated revenue of Rs 0.356 million through manufacture of CIPHET developed tomato grader on demand by enterprise, trainings, technology licensing and incubation.

POST-HARVEST TECHNOLOGIES FROM CIPHET, LUDHIANA

BPD Unit, Central Potato Research Institute, Shimla

Operational since	22 May 2013
Sector	Horticulture, potato cultivars, postharvest management and processing
Address	BPD Unit, CPRI, Shimla- 171 001, Himachal Pradesh
Telephone No.	0181-2791474
E-mail	minhas.joginder@gmail.com
Website	www.cpri.ernet.in

Top technologies for commercialization

- Aeroponics soil-less system for potato mini-tuber production
- Dipstick Kit for detection of potato viruses
- Bioformulation "B5" (Biofertilizer and biopesticide)
- Improved heap storage technology
- A process for the preparation of high quality dehydrated potato cubes and shreds"
- Tractor-drawn fertilizer drill cum line marker -
- Tractor-drawn automatic potato planter-.

Successful clients

- Rajdeep Agri. Product. Pvt. Ltd.
- Sekhon Biotech Pvt. Ltd.

Achievements and Impacts

- Capacity building of seed growers towards quality potato seed production
- Licensed aeroponics technology to two clients

MOU EXCHANGE FOR POTATO PRODUCTION TECHNOLOGIES

BPD Unit, Indian Institute of Vegetable Research, Varanasi

Operational since	22 May 2013
Primary Sector	Horticulture
Secondary Sector	Vegetables, postharvest management
Address	BPD Unit, IIVR, Varanasi -221305, Uttar Pradesh
Telephone No.	0542-2635236, 2635247
E-mail	bpdiivr@gmail.com; pmsiivr@gmail.com
Website	**www.iivr.org.in**

Top technologies for commercialization

- Cowpea variety 'Kashi Kanchan', 'Kashi Unnati', 'Kashi Nidhi' and 'Kashi Gauri'
- Other crop varieties (bottle gourd, chilli, brinjal, okra, tomato, cauliflower)
- Osmo-drying of vegetables
- Ready-to-eat chips of vegetables
- Green chilli powder

Successful clients

- Ravi Hybrid Seeds Pvt. Ltd
- Sadhan Seeds Pvt. Ltd

Achievements and Impacts

- Has begun revenue generation through membership and technology licensing
- Five technologies commercialized
- Capacity building workshops organized for FPOs, entrepreneurs

VEGETABLE VARIETIES ON DISPLAY

CHAPTER VI: USHERING IN CHANGE IN NARS THROUGH BPD UNITS

One of the specific objectives of NAIP Component I was that of building critical capacity of the ICAR and thereby being a catalyst that enables changes to the NARS. The BPD Units have outshone all the other sub-projects under the project and has brought in transformative changes to the way research can be done within the System. It has shown how it can be an alternate, but effective platform for translating research to results at the ground while at the same time providing better feedback to the scientists so as to refocus their attention on conducting research that is more market-oriented and scalable. This chapter highlights the achievements of the BPD Units and the interventions made through this sub-project that has ushered in change to the system.

The main idea behind the concept of the BPD Units was to bring about change in NARS by encouraging, nurturing and supporting technologists and scientists with an opportunity to turn their innovative research ideas into sound commercial ventures through entrepreneurship development. In the short span of four years, the BPD Units have played a significant role in bringing about sustainable and lasting change in the way agricultural research is conducted in the NARS. The BPD Units have been able to perform very well on various aspects through the mantra of *business*, as outlined in sections below.

Building Entrepreneurship and Enterprises through NARS

The BPD Units have been able to effectively use the technology and knowledge repository of the NARS to support agri-business ventures, thus achieving more than the traditional extension mode. As can be seen in Figure 12, the 22 incubators are currently providing incubation support to 1,218 entrepreneurs/ agri-based start-ups. Ninety-one ventures have successfully graduated from the incubator.

Overall, it is estimated that through this NAIP initiative, about 219,973 jobs have been created in the rural economy through these incubated agri-business ventures while 140 thousand farmers have benefited from the products and services developed by them. The incubators have also trained more than 3,700 entrepreneurs on the different aspects of agri-business, agri-business opportunities and helped in their capacity building.

Ushering in a Business Culture in NARS

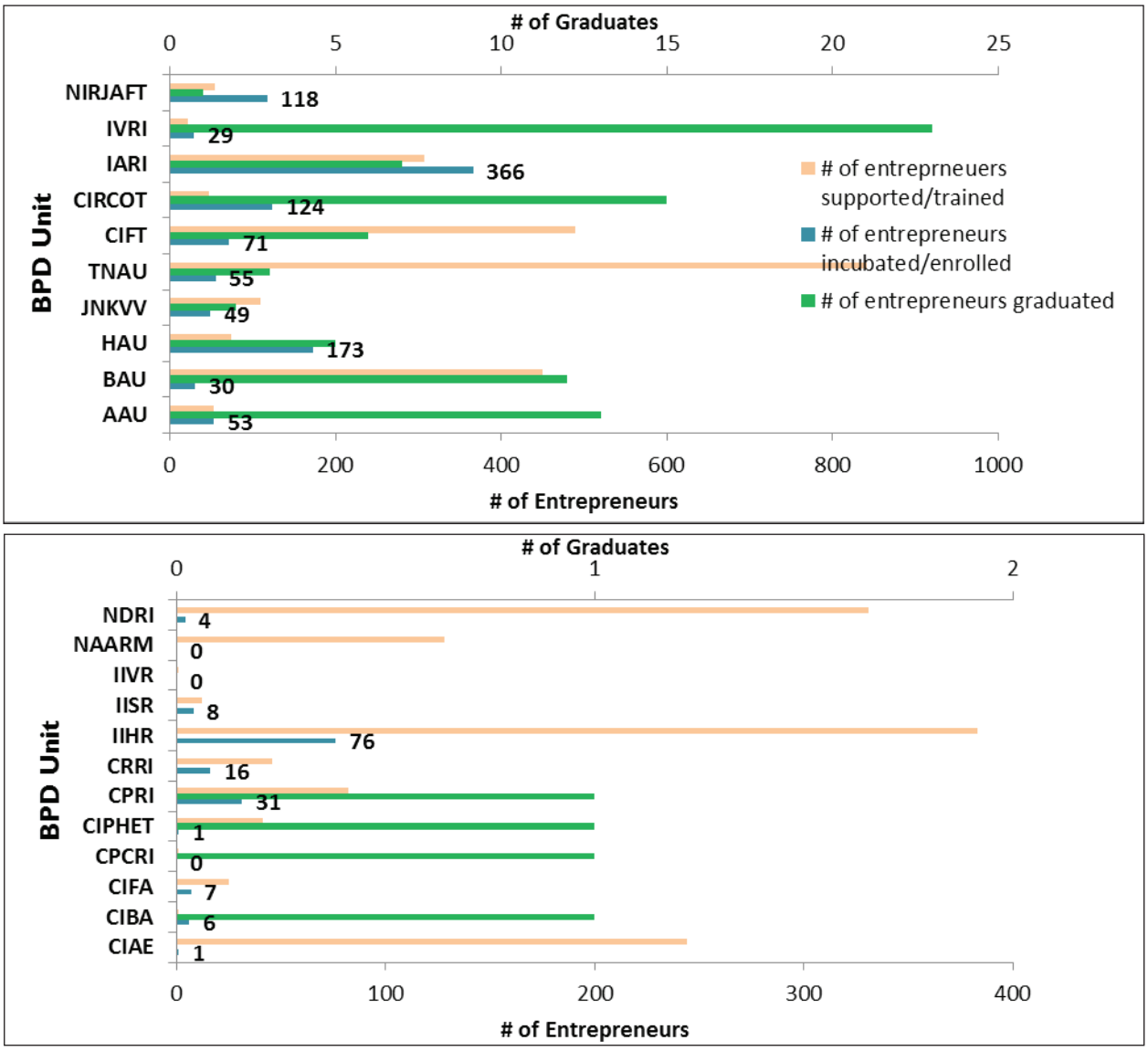
The BPD Units have brought in a healthy business culture in the NARS, with a positive influence on the number of technologies commercialized, revenue generated, innovative partnerships forged, and entrepreneurs supported.

The BPD Units are essentially business oriented in their operations and outlook. Hence each Unit has a business manager selected from reputed management institutes of the country, along with a support team from research and management backgrounds. This has driven a greater understanding of the entrepreneurs' requirements and the ability to cater to them in a professional manner.

The BPD Units followed a market and service oriented approach to meet their targets and deliverables. Each business activity undertaken by the BPD Unit was outlined clearly in terms of its execution and financial commitments. This ensured that the technology providers are remunerated for their time and

services while the clients are guaranteed the services they need. This approach was new to NARS and was institutionalized by the BPD Unit through tariffs, rate cards and service agreements. The IP guidelines followed in ICAR were also adopted by the BPD Units while engaging with clients and providing services. BPD Units were supported by a 72-member mentor network developed by ABI-ICRISAT that was comprised of mentors from different domains and functional areas such as marketing, finance and the like.

Figure 12. Incubator statistics on entrepreneurs nurtured



Source: BPD data (December 2013).

Again, BPD Unit activities were monitored on a different set of business-oriented yardsticks by ABI-ICRISAT to assess the progress and address the gaps in deliverables. The M&E system implemented by the NAIP also ensured that the reporting was done periodically and records updated regularly. An interesting feature of

this approach was the innovative partnerships that were developed by the BPD Units among themselves and among their clients so as to leverage mutual strengths where necessary.

The annual NIABI National Awards for the Best Incubator, instituted by the handholding partner, helped instill a competitive spirit amongst the Units and has had four winners so far: BPD Unit, TNAU (2011); ZTM-BPD Unit, IARI and ZTM-BPD Unit, IVRI (2012); and ZTM-BPD Unit, CIFT (2013).

The Units have won laurels and accolades at other forums as well. It is a matter of pride that the clients (or incubatees) of the Units have also won awards and recognitions in the public forum. Such appreciation is yet another positive reflection on the initiatives made by the NARS in this subcomponent.

Systematizing Change in NARS

Change is ubiquitous and inevitable. The introduction of BPD Units in NARS has brought in new systems and procedures in different areas of operation. Accountability and responsibilities have become the keywords and outcomes and deliverables are constantly being monitored. The concept of an agri-business incubator (or BPD Unit) was new to the system and the presence of ABI-ICRISAT helped in smoother initiation of the systems and process, while following the guidelines provided by NAIP. All the BPD Units were provided with adequate funds to develop their infrastructure and relevant facilities that were needed in their domain for servicing clients.

The GoI, through the DST, has been actively promoting the concept of business incubators. One major incentive provided is the tax benefit to the incubator, provided it becomes a Society. This is one area that is being explored by the BPD Units that will ultimately benefit clients and promote more ventures in the sector. For example, the BPD Unit of TNAU has been registered as Agri-Business Incubation Society-TNAU as per the Tamil Nadu Societies Registration Act, 1975, under which the incubator can avail Service Tax exemption. Recently, the BPD Unit of BAU was approved to be considered as a Section 25 society by the parent university. This shows a change in the mindset of the leadership in ensuring the sustainability of the incubator and inherent faith in its deliverables as a *game changer* for the sector.

Another change in the system was the environment that was developed by the BPD Units for engaging with multiple players – both public and private – from the agricultural sector. The incubator became the central hub for connecting with all these different stakeholders-entrepreneurs, researchers, scientists, public and private agro-companies, government agencies, funding and marketing players and the like. These initiatives were systematized by the handholding partner through training, exposure visits and networking events which could be later implemented at the Unit.

The performance of the BPD Units had been reviewed on a half-yearly basis by ABI-ICRISAT, which used different yardsticks to assess performance. This helped in understanding the level of transformation brought about by the Unit within its operating environment, while providing feedback to NAIP and ABI program as to where improvements were needed.

Incubating Innovations of Start-ups in NARS

The concept of business incubation is to encourage the development of start-ups and to ensure that they survive the initial years of business hardships. It also allows for identifying and nurturing innovations from the grassroots that could have business potential and manifold social impact in the rural community. This allows NARS to be more tuned in to the demands of the sector and completes the feedback cycle, which allows for new technology development and refinement of existing technology. This also opens up a new facet to the way NARS operates. The BPD Units have incubated many innovative ideas that have progressed to the prototype stage and generated interest amongst the funding community. Funding from such agencies will support the venture to reach production stage.

The BPD Units have so far facilitated the filing of 285 patent applications, of which 37 have been granted.

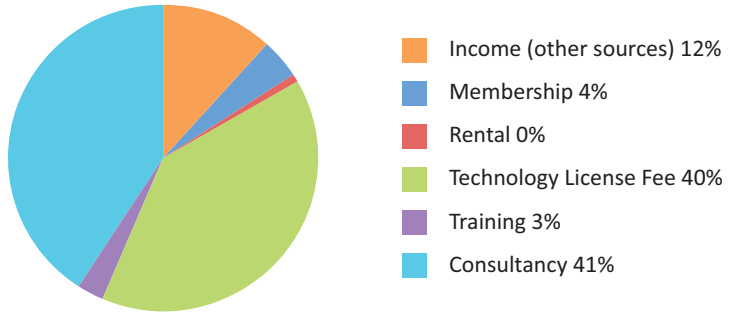
New Revenue Stream to NARS

The BPD Units have been able to open up new sources of revenue for the NARS such as rental charges, membership fees, incubation service packages, business development fees, traditional modes of technology transfer fee, royalty fee, consultancy assignments and training programs, Since the inception of the project, the BPD Units have generated revenue worth Rs 2,43.3 million for NARS (Figure 14). While the first set of BPD Units, through the incubators of AAU, NIRJAFT and TNAU, have refocused on revenue generation a lot still remains to be achieved. While it is expected that new BPD Units will take time to become operational, the performance of the units at CPCRI and CRRI need to be monitored, especially when other units have shown considerable revenue generation within six months of inception.

The main source of revenue has been technology commercialization and consultancy work undertaken by the BPD Unit (Figure 13). This highlights two critical aspects:

1. There is revenue to be realized from the technologies developed by NARS, and the incubators have shown how it can be tapped.
2. Private sector agri-companies and SMEs need support and are willing to utilize the expertise of the incubators on a consultancy basis.

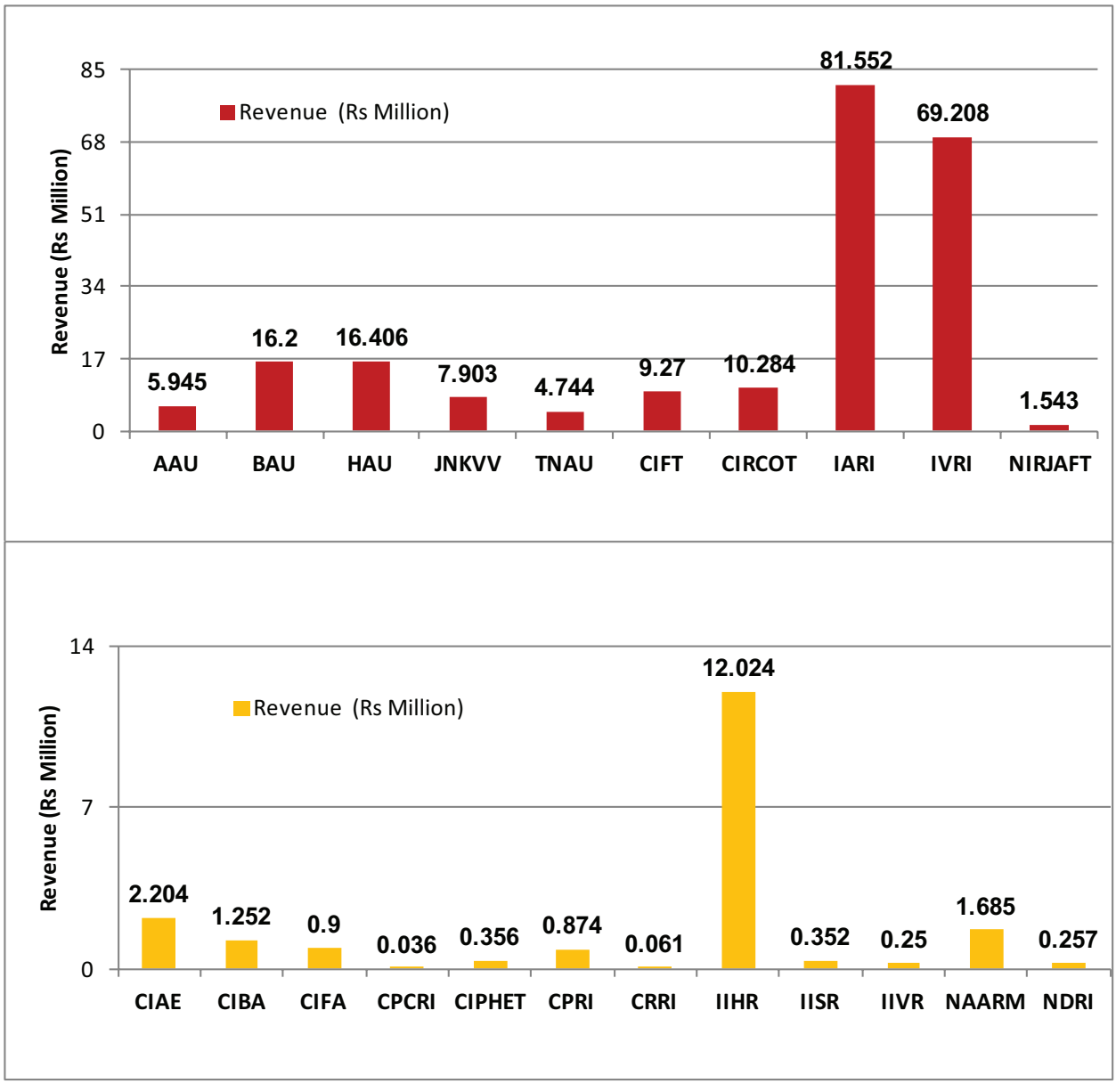
Figure 13. Revenue sources



Source: BPD Data (December 2013).

The other sources of revenue show that with improved infrastructure and streamlining of services and departments, the incubator stands to realize more revenue. This will help in sustaining the operations of the BPD Unit after the project period.

Figure 14. Revenue generation by BPD Units



Source: BPD Data (December 2013).

The BPD Units have also looked ahead and tried to source funds for Units and incubatees through different government agencies and their schemes (Table 4). This has ensured that units have sufficient funds to meet their burnout rates, and as reserve funds, after the end of the project period. This ensures sustainability of its operations. The newly started incubators can look at these partnerships to bring in much-needed

funds to sustain their operations in the long term. In addition, some of the schemes offer incentives to the incubators in terms of grants and tax benefits, which can be passed on to the incubatees.

Table 4. BPD Units and other support agencies

IARI	IVRI	CIFT	CIRCOT	AAU	BAU	CCSHAU	JNKVV	TNAU
SBIRI BIPP BIRAP MSME	MSME SFAC	MSME	MSME Govt of Maharashtra	MSME	MSME SFAC Govt of Jharkhand NABARD	MSME PNB-FTC SFAC	MSME SFAC	TDB MSME

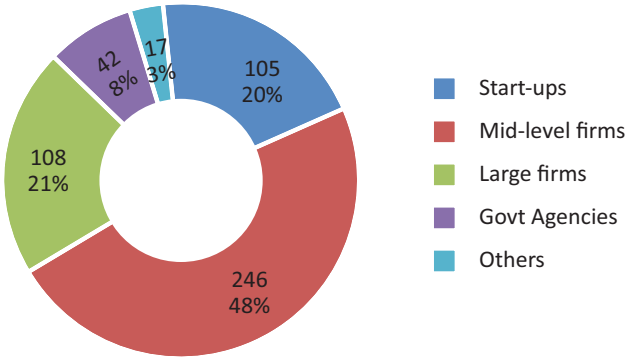
Source: BPD Data

Enhancing Market Oriented Technology Commercialization in NARS

FACILITATING TECHNOLOGY TRANSFER BETWEEN ICAR AND PRIVATE SECTOR

The business approach adopted has helped promote high potential technologies from the NARS, especially to agro-input and agro-biotechnology companies. The BPD Unit provides the stage for such companies to interact and engage with the scientists in the NARS and enables joint collaborative projects, technology developments and refinement activities. The role of the BPD Unit here is only that of the facilitator, but it is key to the success of the collaboration. Again, the incubator provides for technology commercialization by understanding the needs of the market and focuses its efforts in identifying the required technology and allied resources to meet such demands. Based on the analysis of data from BPD Units, it was found that there are 518 licensees for the technologies that have so far been commercialized. Figure 15 shows the diverse set of technology takers (or licensees) for technologies of NARS which was facilitated by BPD Units.

Figure 15. Diversity of technology takers through BPD Units



Source: BPD Data.

This shows that the investors have confidence in routing the process through the BPD Units, mainly due to the service package that these incubators offer. Some of the BPD Units have even managed to commercialize technologies internationally; for example, ZTM-BPD Unit, CIRCOT was able to promote the Bt Cotton detection kit in South Africa and China.

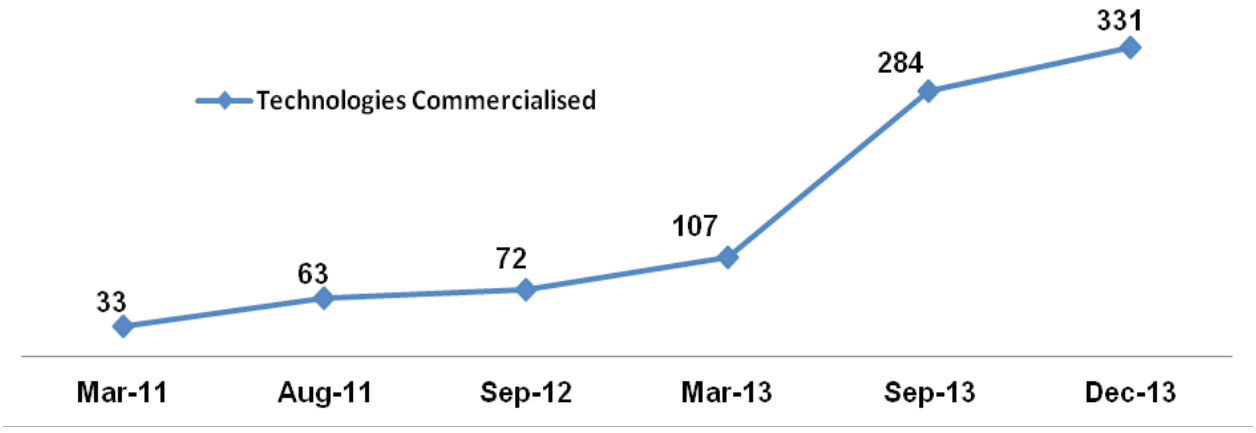
Seamless Scale-up and Speed of Technology Transfer in NARS

Technology transfer through the extension machinery has now found an alternative channel through the BPD Units. Compared to the supply-driven mode of the extension machinery, the incubator focuses more on market-oriented technology commercialization. Technology transfer can be defined as the transfer of a technology, technique, or knowledge that has been developed in one organization and then transferred to another where it is adopted and used.

Mowery captured its importance in this manner: "The economic impact of innovation, whether revealed in productivity growth, employment creation and destruction, or changes in wages and profits, is realized only through the adoption of innovations." In other words, technology business incubators such as BPD Units have an inherent capacity for economic impact through facilitating technology transfer[15].

The fact that BPD Units have proved their potential as effective technology transfer conduits can be seen in Figure 16. The increasing number of technologies being commercialized through the BPD Units indicates that the NARS is becoming more adapted to the concept of business incubators for technology identification and for its commercialization.

Figure 16. Technologies commercialized through BPD Units



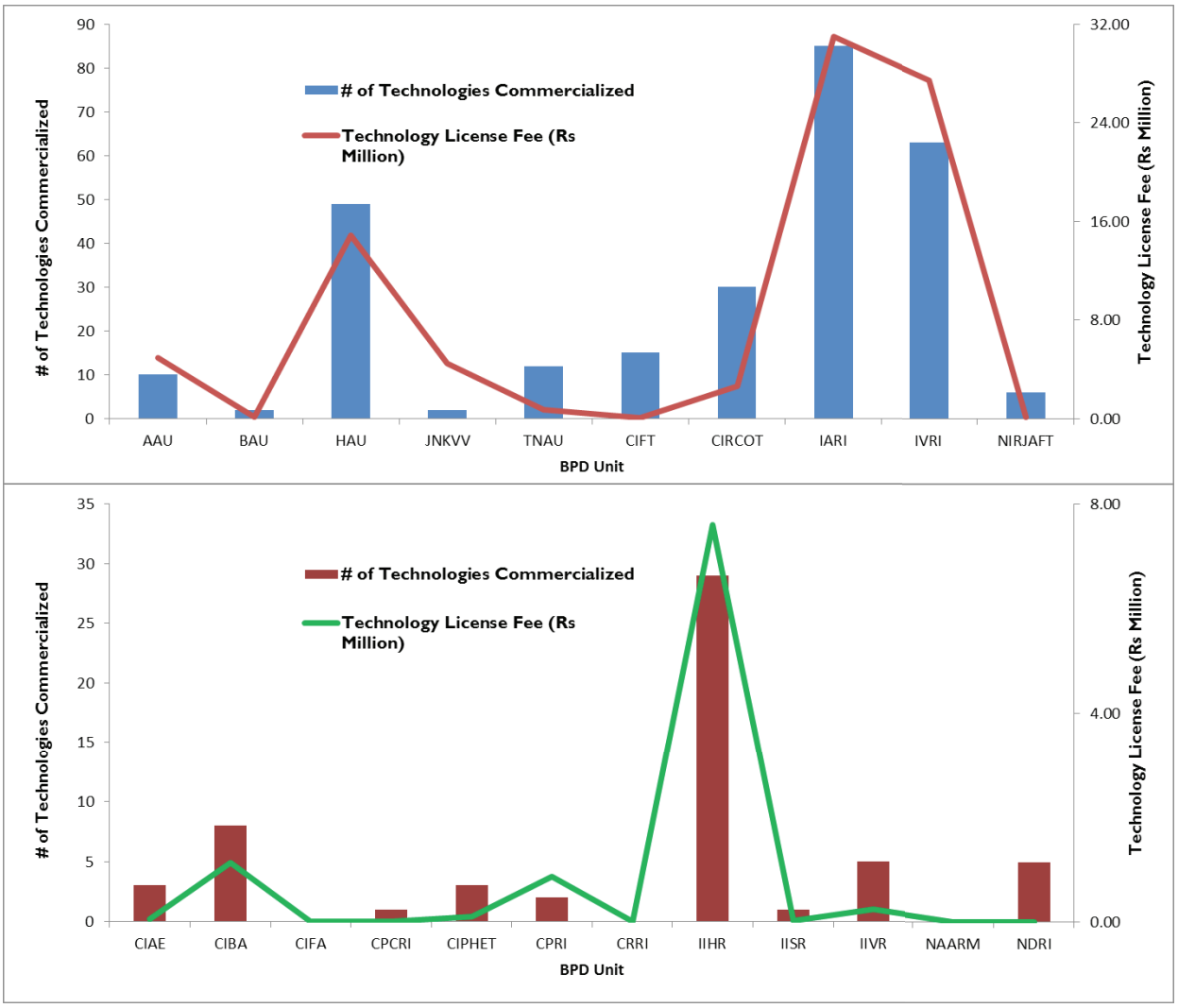
Source: BPD data (December 2013).

A snapshot of the incubator-wise data on technologies commercialized and revenue generated through the transfer is given in Figure 17. While some of the older units have performed well, there is still scope for improvement. An improvement is to be expected with the systems becoming fully operational for a

15 Indian STEP & Business Incubators Association (ISBA)

few of the currently underperforming units. As for the new incubators, the unit at IIHR is way ahead of the others in this aspect.

Figure 17. BPD Unit wise technology transfer and revenue



Source: BPD data (December 2013).

The sub-project from NAIP was even able to streamline the process of technology transfer and the BPD Units proved themselves to be good conduits of technology commercialization during the Agri-Tech Investors Meet. The units were guided by ABI-ICRISAT through a process that involved short listing of technology, evaluation and valuation, market assessment and promotion and finally signing up for technology transfer. More details are given in Box 1.

Box 1. Agri-Tech Investors Meet

ABI-ICRISAT, in collaboration with NAIP-ICAR, successfully conducted the Agri-Tech Investors Meet at New Delhi during 18-19 July, 2013.

During the event, a "*Compendium of NAIP Technologies*" which has potential for wide-scale commercialization, was released. The event was attended by more than 400 participants representing industry, agri-scientists, entrepreneurs, investors and incubator professionals.

The event had over 40 presentations on agro-technologies, an agri-tech expo and 98 B2B (Business-to-Business) meetings involving scientists, industrialists and agri-business entrepreneurs, for which 43 Letters of Interest (LOIs) were signed for technology commercialization.

A total of 53 technologies were commercialized to 80 licensees, which raised Rs 31.7 million as technology transfer revenue.

The BPD Unit of CIRCOT bagged the award for the Best ICAR-BPD for generating maximum license fee (Rs 10.7 million) while the BPD Unit of AAU won award for Best SAU-BPD category (Rs 1.1 million). The BPD Unit of IVRI got the award for the maximum number of licensees for NAIP and non-NAIP technologies (25).

The award for the maximum value for a single license agreement (Rs 6 million) went to Dr Arunav Goswami and Dr Madhuban Gopal for their technology on Nanofungicide. Dr N Vigneswaran of CIRCOT got the award for generating maximum licenses per technology (5 licenses, each of value Rs. 1.68 million) for his technology on Nanocellulose production.

Source: ABI Program (July 2013)

Soft-landing and South-South Collaboration in NARS

With the growth of the incubators, the BPD Units have received diverse enquiries from different parts of the country and even foreign shores. BPD Units are now getting consultancy assignments from Asia and African countries (BPD Unit, TNAU and ZTM-BPD Unit, CIFT) that in the future may be expected to be converted into full-fledged business plan development and project implementation.

NAIP-ICAR, ICRISAT, FARA and other Government agencies had signed a declaration for South-South Collaboration at the NIABI 2012 Global Conference. This will be a good platform for the BPD Units to consider entering the global stage to promote their business incubation services to foreign agro-companies planning to enter India, and to take their clients and NARS technologies to global markets.

PROMOTING AGRIBUSINESS THROUGH GLOBAL AGRI-BUSINESS INCUBATION NETWORK

CHAPTER VII: THE WAY FORWARD

The BPD Unit-led change within the ICAR and the Indian NARS has shown the pathway for transforming the Indian agricultural sector. The success of this intervention from the NAIP has led the ICAR to plan for setting up another 100 Units across the country in the current Plan Period. However, the challenges that beset the Units need to be resolved and newer plans chalked up so as to integrate a wider audience to this major intervention. This chapter outlines some of the strategies that may be considered for the future course of work.

The growth of entrepreneurship in the agriculture sector is very much the need of the hour. However the challenges that can hinder such growth are plenty. There is need for a mechanism that can facilitate agri-business ventures. It has been proven that business incubators can be an effective model that can be considered not only for technology transfer and commercialization but also to achieve growth of the venture by offering the required business ecosystem. Agri-business incubators are relatively new to the arena, but have seen considerable success, which can be a compelling reason for them to be viewed as an alternate and effective extension model for the growth and prosperity of the agricultural and rural sectors.

Thus the establishment of 22 NAIP ICAR BPD Units has brought in a healthy business culture in the Indian NARS with a positive influence in terms of the number of technologies commercialized, revenue generated, innovative partnerships forged and entrepreneurs supported. It has also proven to be a flexible platform for promoting entrepreneurship through which inclusive development of the community – and thereby economic development – has been achieved.

Even though there has been a visible impact and inclusive development achieved through BPDs, some further key measures are required to address the potential challenges that hinder agri-business development,and new models and approach are required to promoteSMEs, small and marginal farmers and rural youth, to address these challenges and drive progressive growth. Some of these are as follows:

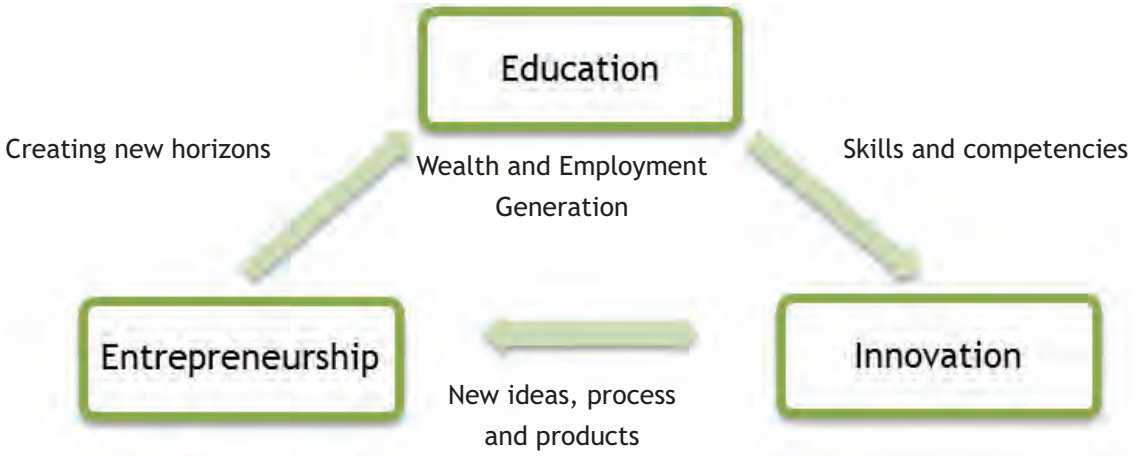
Capacity Building of Entrepreneurs in Agri-business

To create a pool of agripreneurs to spark an agri-business revolution, entrepreneurial capacities should be inculcated into the education curriculum (Figure 18) as a potential profession to motivate school students and graduates in agriculture and allied sectors to take up agri-business as a livelihood option. Entrepreneurial capacity building should include quality vocational training and skill development and should help the graduates in developing their new ideas and innovations.

Facilitating Funding

In order to encourage and support entrepreneurs, the GoI has, in the past, given a lot of emphasis to developing the SME sector, directing financial agencies to give credit to the sector, but this has not yet fully benefited the start-ups partly due to the risk averse nature of the banking industry. This problem can now be addressed with business incubators standing as facilitators, seed capital investors and underwriters of collateral.

Figure 18. Entrepreneurship in agriculture



Source: Entrepreneurship, National Knowledge Commission, GoI.

Improved support systems

Clearances and mandatory licensing required for setting up of the venture should be processed as quickly as possible and through a single window system. E-Governance and simplified regulatory policies will be a major fillip. Tax sops and other incentives should be extended to the agri-business sector also.

Scaling up agri-business incubators across the country through Public Private Partnerships

Agri-business incubation in Indian NARS has shown tremendous potential over the last five years in terms of agriculture and economic development of the country through entrepreneurship. The 22 NAIP BPDs have exhibited results that have nurtured start-ups for future agriculture development of the country. The current agri-business incubators address only a fraction of the population against the burgeoning growth of the country. Thus, creation of larger numbers of business incubators through public private partnership would help build and scale up the entrepreneur ecosystem in agriculture.

Various opportunities now exist in the country and steps need to be undertaken for post NAIP through the Public Private Partnership (PPP) initiatives with the intent of promoting entrepreneurship in agriculture and benefiting the small-holder farmers. They are as follows:

CSR investments in TBI

The GoI's budget for the financial year 2013-2014 has been a good boost to the incubators in the country. Funds provided to TBIs located within academic Institutions and approved by the Central Government will qualify as Corporate Social Responsibility (CSR) expenditure. The government's effort in providing direction and channelizing it towards incubation is a positive policy decision. These CSR investments will give incubators better access to a wider pool of funds. ABI-ICRISAT conducted a brainstorming session on

sustainability of BPDs among various stakeholders on 6th December, 2013 and came out with a PPP-based concept note for BPDs to scale up and sustain through these new CSR opportunities.

ICAR Investment in ABIs (BPDs) through 12th Plan

For the twelfth Five Year Plan, ICAR has proposed a number of new initiatives, which include setting up Research Consortia Platforms like agri-business incubators involving partnership of ICAR institutions with R&D organizations within and outside the NARS. Under this initiative, it is proposed to sustain and scale the current BPDs of NAIP ICAR from 22 BPDs to 50 BPDs across the country in the next three years. This plan is under the purview of the planning commission, which is expected to roll out the initiative soon.

New Models of Agri-Business Incubators and Possible Future Line of Work

Based on the deliberations of the stakeholders held during the 10th year celebrations of ABI-ICRISAT and the BPD Units, new models for possible future lines of work that may be taken up in line with the needs of entrepreneurs to ensure the future of agricultural growth have been proposed. Three incubator models are envisaged for leading this incubation movement in the country (Figure 19).

Figure 19. Proposed incubator models

ABI Model 1	ABI Model 2	ABI Model 3
Value Chain Agribusiness Incubator (VCABI)	**Attracting Rural Youth In Agriculture (ARYA) Incubator**	**Agrotech Business Incubator (ATBI)**
Agro Produce oriented development by promotion of enterprise across the value chain through FPO & SME	Motivate the rural youth especially to accept and appreciate farming/food production as a commercial venture	ATBI will support technology commercialization and innovation based SMEs, start-ups
Example: Paddy-Satnam Overseas Limited, Coconut-Marico Industries	Example: Agri skill based rural operations/Textile-LMW / Aravind	Example: CIPHET- Alfalavel, IVRI-Suguna Hatcheries
Investment: Rs 2-5 cr Impacts: 150 ventures & 20000 farmers	Investment: Rs0.5-1 cr Impacts: 200 ventures & 50 technologies	Investment: Rs 1.5-3 cr Impacts: 70-100 ventures

Model 1: Value Chain Agri-Business Incubator (VCABI)

The VCABI will primarily focus on setting up managing of the value chain for various crops (depending on the competency of the institute) combined with the business support packages offered by the incubator. It will develop, support and promote small enterprises throughout the country, ensuring their growth and sustainability, in coordination and partnership with various role players, including global partners, who make international best practices available to local entrepreneurs.

In short, VCABI will ensure that the farmers get the best possible resources, support and information in their endeavor to get better returns. The model is also flexible whereby an entrepreneurial farmer can take up value chain enhancement activities by enlistingthe support of other farmers in the locality. The role players will include public and private agri-players, input suppliers, marketing agencies etc. The support under VCABI can be availed at three different stages, thus helping both start-up ventures and SMEs to bigger ventures depending upon their business lifecycle and value chain interventions. The incubator at Timbali South Africa is cited asthe best example of such a model. The activities that can be adopted by VCABI include franchising operations in value chain of flowers, fruits etc.

Core Objectives of VCABI

- To enhance the competitiveness and capabilities of small enterprises through coordinated services, programs and value chain projects.
- To ensure access for small enterprises to business support services through theagri-business incubator.
- To enhance the returns to the farmer by way of value addition of crops by utilizing food processing technology and by providing employment opportunities to agriculture graduates.

Support services of VCABI

- Setting up value chain support by way of production and crop management techniques
- Providing holistic, end-to-end support for the SME and entrepreneur
- Infrastructure facilities for food processing and packaging
- Technology development
- Inbound and outbound logistics support through networks
- Marketing and promotional strategy using AGRINDIA
- Business development services
- Statutory and regulatory clearances as mandated by GoI and other governments
- Soft-landing assistance to other countries using incubator networks
- Finance solutions
- Human resource aspects
- Training and mentoring to farmers groups, cooperatives etc.

Intervention stages and Components of VCABI (based on phases of client lifecycle)

Stage 1.	**VCABI Business Start**	This package provides tools and techniques for clients who are ready to start a business and want assistance and direction. • Business planning • Business counseling • Access to finance • Business support
Stage 2.	**VCABI Business Build**	This package is designed to assist clients who want skills to sustain and strengthen their businesses and assistance includes: • Capacity building systems • Mentorship • Tender advice/ procurement • Export readiness • Franchising
Stage 3.	**VCABI Business Grow**	This package is targeted at entrepreneurs who wish to grow their businesses and expand nationally and internationally. VCABI will assist with: • Business systems development • Cooperative support • Growth strategies

Approach and benefits of VCABI

The value chain approach involves all stakeholders, i.e. farmers, traders, processors, consumers etc. It targets loss prevention to agri-produce, value addition, rural employment and quality raw material and processed products. The value chain incubator can be set up in partnership between a Public R&D institute/SAU with a private organization specializing in a specific crop /agro product. For example, in the case of the value chain for paddy, the Department of Rice Research/Central Rice Research Institute can partner with Syngenta foundation or Satnam Overseas on PPP basis. The investment range per value chain Incubator ranges from Rs 20 to Rs 50million depending on the number of product lines and the geography of operations. The Public institute could contribute technical knowledge and infrastructure, while the private partner could contribute management, marketing, financial and client services. The VCABI can be usedfor paddy, wheat, maize, fruits, dairy, fisheries, floriculture etc. Each incubator can promote 150 agri-business ventures and benefit a minimum of 20,000 farmers. In the Indian context of mainly smallholder agriculture, this model is an effective approach.

Model 2: Attracting Rural Youth in Agriculture Incubator (ARYA-i)

The concept behind the ARYA Incubator is to motivate the rural youth in particular, to accept and appreciate farming/food production as a commercial venture, thereby taking up farming as a life time vocation.

Core Objectives of ARYA-i

- Make the youth see that farming can be a commercial business venture.
- Generate appreciable income to meet farmers' domestic and personal needs.
- Improve the living standard of the youth through better income.
- Motivate the youth to stay in rural areas, as inputs will be delivered at their farm gates, on credit and interest free basis.
- Stimulate rural development spurred on by the youth.
- Produce enough food crops, meat and fish using modern methods, thus contributing to national food security.

Eligibility to join ARYA-i

- Primarily rural youth of less than 25 years of age
- Positive attitude and commitment
- Group of young men and women in a community interested in farming
- Should be located within the geography and be able to understand the language of instruction of the incubator
- Letter of confirmation for access to land /livestock post-incubation

Components of ARYA-i

Farming venture	• ARYA Incubator will lease land under the SAUs to rural youth who are interested in taking up farm business ventures. • Incubation period is three years. • ARYA Incubator will provide its client with scientific and technical backstopping, inputs and other support services like bank loans, marketing, training, mentoring etc. • ARYA Incubator can operate on a BOLT or Implement, Operate and Transfer model that involves joint activities in implementing innovative farm ventures with innovator entrepreneur, testing it through operations and later transferring the same to the entrepreneur. • Entrepreneur will have to pay for leased land by repaying a pre-fixed sum at the end of each harvest.

Livestock and Poultry	• This component targets unemployed youth to take to the production of livestock and poultry (broilers, layers, guinea fowls and piggery). They will be assisted with day-old chicks of broilers, layers and guinea fowls. They will be provided with housing, feed, drugs and vaccines, and utilities until they are weaned off the incubation support in one year. • ARYA-i will arrange to provide technical and scientific assistance to the entrepreneur as well as management of the unit.
Fisheries-Aquaculture	• ARYA-i will provide rural youth interested in setting up aquaculture units with technologies developed by fisheries research institutes. Since it is a full time business, it will reduce unemployment and poverty. • Water body can be leased out and fingerlings can be given on credit which will have to be repaid within two years.
Agri-business	• ARYA-i will focus on supporting youth with Agri Business Services and marketing, and market it through AGRINDIA. • ARY-i will provide training on the agri equipment hiring and agri marketing to the entrepreneur who can avail the services that are available in the SAU.

Support services provided by ARYA-i

- Tractor services and other farm machinery for farm business ventures on rental basis.
- Supply of inputs such as seeds, agrochemicals, and sacks at subsidized rates on credit without interest and to be repaid in two years.
- Facilitating marketing of produce which will assist in branding, QC, standardization and packing.
- Technical support from the concerned crop and agronomy department in SAU.
- Training on good agricultural practices by extension department of SAU.
- Monthly stipend to rural youth for a period of two years to sustain the drive, which will be repaid by the entrepreneur from the returns generated by his/her venture.
- Encouragement and motivation through awards, rewards and publicity of STAR performer

Approach and Benefits of ARYA-i

The ARYA-i approach involves empowering rural youth and Farmers Producers Organization (FPOs)as next generation farmers, traders, processors etc. It targets employment generation for rural youth in agriculture by providing opportunities in farming and agri-business. The ARYA Incubator can be set up in partnership between a SAU/Krishi Vigyan Kendra in partnership with a private organization/NGO specializing in CSR/Livelihoods. For example, TNAU-Aduthurai Rice Research Centre/KVK, Patthanamitta and Syngenta foundation can partner for paddy cultivation and mechanization; and for textile /ginning/hosieries it can partner with LMW /ARAVIND on PPP basis. The investment range per ARYA Incubator ranges from Rs 5 to 10million depending on operations. The public institute could contribute via technical, training, land

and facilities, while the private partner could contributevia management, marketing of agro produce, and financial and client services. The ARYA incubator can be operated in agricultural services and production of paddy, wheat, maize, fruits, dairy, fisheries, floriculture, and skills-oriented aspects of jute, coir, textiles etc. Each incubator can promote 200 Agri-business ventures and help promote agriculture as a career opportunity among youth. In the Indian context where the rural youth are migrating to urban areas, this model can be an effective approach to mitigate this migration.

Model 3: Agrotech Business Incubator (ATBI)

The ATBI adopts a PPP approach which links NARS Institutes, education, research and business in sustainable agriculture and supports the following interventions:

- Development and implementation of collaborative programs fostering innovation, among universities, research institutions and the private sector.
- Development and implementation of improved and better contextualized undergraduate and post graduate agri-business teaching and learning.
- Facilitating exchange of experiences and sharing of resources and knowledge.

ATBI will support the establishment of agri-business innovation incubators that will function as training, research and advisory centers for SMEs, start-ups and enterprises undertaking change and innovation.

Core Objectives of ATBI

- Facilitate the creation of competitive agri-business enterprises through technology development and commercialization.
- Support start-up entrepreneurs and new or expanding enterprises with the services they require from conceptualization to implementation and scaling up.

Support services provided by ATBI

- One of the ICAR Institutes can be the lead institution, while other institutes in the region will assist it in technology commercialization and support innovations.
- Access to qualified training, research and development personnel in the areas of knowledge with which they identify.
- The ability to market high value products and services will be achieved through it.
- The capability to provide managerial skills to firms, particularly SMEs that do not have such resources.
- Access to well-qualified mentors through NIABI.
- Competent assistance in conducting feasibility studies and developing business plans.
- Access to cost-effective problem-solving expertise.
- Access to adequately equipped laboratories and field sites for development and testing of technologies.

Approach and Benefits of ATBI

The ATBI approach involves promoting start-ups, SMEs, Industries and FPO in agri-business. This benefits farmers through new products and technology that can enhance their production and creates market opportunities and self-employment and employment opportunities. The current 22 NAIP BPDs are primarily based on these models through technology commercialization.The ATBI can be set upeither as a Public entity or through PPP mode between ICAR Institute/SAUs and private organizations on specific products. For example, in the area of food processing, CIPHET, Ludhiana can partner with AlfaLavel and IVRI can partner with Suguna Hatcheries on a PPP basis. The investment range per ATBI ranges from Rs 15 to 30 million depending on operations. The public institute could contribute technical inputs, training, land and facilities and the private partner could contribute in the areas of management, marketing of agro produces, financial and client services. ATBI incubator can be operated in agrotech-oriented activities, food technology, biotechnology, textiles, farm mechanization etc. Each incubator can promote 100 agri-business ventures and promote agriculture as a career opportunity among SMEs, start-ups and industry. In the Indian context, where future growth is in Innovation and competitive markets, this model can be an effective approach.

In conclusion, the agri-business development in the country has been given an impetus through the ICAR's initiative to set up the BPD Units under the NAIP. However, when compared to the need and growth of the country, the number of agri-business incubators present is very less and there remains an urgent need to scale up the same and further enhance the environment for encouraging agri-business by facilitating funding, improved support systems, capacity building of entrepreneurs in agri-business and adaption of new models of agri-business incubators. This will pave the way for promoting agriculture development through inclusive market oriented growth.

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Annexure 1. Performance metrics and scoring parameters

Indicator	Scoring
SYSTEMS	
Business Plan	▪ *1: Complied/Completed/Executed* ▪ *0.75: Initiated, executed but expected results pending due to external factors* ▪ *0.5: Initiated and meeting halfway of expected outcome* ▪ *0.25: Initiated but not yet executed* ▪ *0: Not started/initiated*
Policy Framework	
Professional Staff	
Functional Authority	
Legal Framework	
Host Institute Integration	
Infrastructure	
ACTIVITY	
Promotional Tools	▪ *1: Complied/Completed/Executed* ▪ *0.75: Initiated, executed but results pending due to external factors* ▪ *0.5: Initiated and meeting halfway of expected outcome* ▪ *0.25: Initiated but not yet executed* ▪ *0: Not started/initiated*
Business Lead Generation	
Training and Events	
PHYSICAL TARGETS	
Incubatees	▪ *1: Complied/Completed/Executed* ▪ *0.75: Initiated, executed but pending expected results due to external factors* ▪ *0.5: Initiated and meeting halfway of expected outcome* ▪ *0.25: Initiated but not yet executed* ▪ *0: Not started/initiated*
Technology Commercialization by BPD	
Services	
Consultancy	
FINANCIAL TARGETS	
Budget Utilization	▪ *1: Complied/Completed/Executed* ▪ *0.75: Initiated, executed but results pending due to external factors* ▪ *0.5: Initiated and meeting halfway of expected outcome* ▪ *0.25: Initiated but not yet executed* ▪ *0: Not started/initiated*

Source: Agri-Business Incubation (ABI) Program, ICRISAT.

Annexure 2. Latest BPD PAD Indicators (February 2014)

Sl #	Indicator	AAU	BAU	HAU	JNKVV	TNAU	CIFT	CIRCOT	IARI	IVRI	NIRJAFT
1.	No. of technologies commercialized	10	2	49	2	12	15	30	85	63	6
	Wt. score	1.18	0.24	5.76	0.24	1.41	1.76	3.53	10.00	7.41	0.71
2.	No. of entrepreneurs incubated/ enrolled	53	30	173	49	55	71	124	366	29	118
	Wt. score	1.45	0.82	4.73	1.34	1.50	1.94	3.39	10.00	0.79	3.22
3.	No. of incubatees graduated	13	12	5	2	3	6	15	7	23	1
	Wt. score	5.65	5.22	2.17	0.87	1.30	2.61	6.52	3.04	10.00	0.43
4.	No. of entrepreneurs supported/ trained	53	450	74	109	842	490	47	307	22	54
	Wt. score	0.63	5.34	0.88	1.29	10.00	5.82	0.56	3.65	0.26	0.64
5.	Client servicing (commitment/ delivered)	0	78	250	49	789	40	24	82	21	6
	Wt. score	0.00	0.99	3.17	0.62	10.00	0.51	0.30	1.04	0.27	0.08
6.	Revenue generated for the BPD (Rs. million)	5.945	16.2	16.406	7.903	4.74	9.27	10.284	81.552	69.21	1.583
	Wt. score	0.73	1.99	2.01	0.97	0.58	1.14	1.26	10.00	8.49	0.19
7.	Amount of funding mobilized for incubates (Rs. milion)	1.251	15.0	0	5.0	39.004	25.0	65.8	18.25	1.8	-----
	Wt. score	0.19	2.28	0.00	0.76	5.93	3.80	10.00	2.77	0.27	0.00
8.	No. of consultancy assignments undertaken	3	1	5	2	3	24	24	19	76	4
	Wt. score	1.25	0.42	2.08	0.83	1.25	10.00	10.00	7.92	31.67	1.67
9.	Farmers directly benefited with value addition	1	2700	15000	10000	9000	725		150	1354	465
	Wt. score	0.00	1.80	10.00	6.67	6.00	0.48	0.00	0.10	0.90	0.31

Sl #	Indicator	AAU	BAU	HAU	JNKVV	TNAU	CIFT	CIRCOT	IARI	IVRI	NIRJAFT
10.	No. of local employment generated (direct) through incubatees	14	3356	25		166,495	31820	116	35	17445	100
	Wt. score	0.00	0.20	0.00	0.00	10.00	1.91	0.01	0.00	1.05	0.01
11.	No. of mergers and acquisitions, joint ventures, tie-ups made	12	1	5	9	9	10	3	8	0	-
	Wt. score	10.00	0.83	4.17	7.50	7.50	8.33	2.50	6.67	0.00	0.00
12.	BPD surplus fund (Rs. million)	1.06	1.6	0	7.903	-	0	8.16	0		0
	Wt. score	1.30	1.96	0.00	9.69	0.00	0.00	10.00	0.00	0.00	0.00
13.	a. Number of applications filed for patent	5	2	19	0	3	7	52	14	82	81
	Wt. score	0.61	0.24	2.32	0.00	0.37	0.85	6.34	1.71	10.00	9.88
	b. Number of patents granted	2	0	6	0	-	0	1	1	0	20
	Wt. score	1.00	0.00	3.00	0.00	0.00	0.00	0.50	0.50	0.00	10.00
14.	Number of scientists trained overseas in the frontier areas of science	2	1	0	0	0	0	2	1	0	----
	Wt. score	10.00	5.00	0.00	0.00	0.00	0.00	10.00	5.00	0.00	0.00
15.	Number of scientists trained overseas in consortium-based subject areas	380	0	0	2	0	1	0	1	1	2
	Wt. score	10.00	0.00	0.00	0.05	0.00	0.03	0.00	0.03	0.03	0.05
16.	No. of scientists who participated in conference/ seminar etc. abroad	1	1	0	-	2	0	15	0	1	1
	Wt. score	0.67	0.67	0.00	0.00	1.33	0.00	10.00	0.00	0.67	0.67

Sl #	Indicator	AAU	BAU	HAU	JNKVV	TNAU	CIFT	CIRCOT	IARI	IVRI	NIRJAFT
17.	Number of novel tools/protocols/ methodologies developed	0	0	1	0	0	8	18	1	6	
	Wt. score	0.00	0.00	0.56	0.00	0.00	4.44	10.00	0.56	3.33	0.00
18.	Publications										
	Articles in NAAS rated journals	-	0	0	7		13		0	0	1
	Articles in other journals	11	0	13	2		0		0	0	1
	Book(s)	0	0	0	1		0	9	0	0	1
	Book chapter(s)	2	0	3	4		3	-	2	6	1
	Thesis	2	0	0	0	2	0	-	0	0	0
	Popular article(s) (English)	16	2	0		3	13	1	1	1	2
	Newspaper article(s)	59	10	3		36	120	6	0	15	1
	News Clippings	0	3	0			0		0		
	Seminar/ Symposium/ Conference/ Workshop Proceedings	12	3	32	21	2	7	5	19	14	27
	Technical bulletin(s)	4	0	6		1	2	3	0	3	12
	Manual(s)	1	12	5		1	10		0	0	1
	CDs/Videos	3	0	5		2	15	2	9	0	8
	Popular article(s) in other language	24	10	6		6	2	5	0	0	1
	Folder/Leaflet/ Handout	9	1	37		2	43	26	42	57	8
	Report(s)	4	3	22		4	12	2	0	60	10
	Success stories	2	0	3			12	9	0	6	9
	MOU Signed	0	0	0			0		0		
	sub-total (publication)	149	44	130	35	59	252	68	73	162	83
	Wt. score	5.91	1.75	5.16	1.39	2.34	10.00	2.70	2.90	6.43	3.29
		AAU	**BAU**	**HAU**	**JNKVV**	**TNAU**	**CIFT**	**CIRCOT**	**IARI**	**IVRI**	**NIRJAFT**
	Wt score total	**51**	**30**	**46**	**32**	**60**	**54**	**88**	**66**	**82**	**31**

Sl #	Indicator	CIAE	CIBA	CIFA	CPCRI	CIPHET	CPRI	CRRI	IIHR	IISR	IIVR	NAARM	NDRI
1.	No. of technologies commercialized	3	8	0	1	3	2	0	29	1	5	0	5
	Wt. score	1.03	2.76	0.00	0.34	1.03	0.69	0.00	10.00	0.34	1.72	0.00	1.72
2.	No. of entrepreneurs incubated/enrolled	1	6	7	0	1	31	16	76	8	-	0	4
	Wt. score	0.13	0.79	0.92	0.00	0.13	4.08	2.11	10.00	1.05	0.00	0.00	0.53
3.	No. of incubatees graduated	0	1	0	1	1	1	0	0	-	-	0	0
	Wt. score	0.00	10.00	0.00	10.00	10.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00
4.	No. of entrepreneurs supported/ trained	244	1	25	1	41	82	46	383	12	1	128	331
	Wt. score	6.37	0.03	0.65	0.03	1.07	2.14	1.20	10.00	0.31	0.03	3.34	8.64
5.	Client servicing (commitment/delivered)	1	6	7	0	0	1	2	88	12	-	13	4
	Wt. score	0.11	0.68	0.80	0.00	0.00	0.11	0.23	10.00	1.36	0.00	1.48	0.45
6.	Revenue generated for the BPD (Rs. million)	2.204	1.252	0.9	0.036	0.356	0.875	0.061	12.024	0.352	0.25	1.685	0.257
	Wt. score	1.83	1.04	0.75	0.03	0.30	0.73	0.05	10.00	0.29	0.21	1.40	0.21
7.	Amount of funding mobilized for incubates (Rs. million)	0	0	0	20.0	0.228	0	1.5	0	-	-	0.94	0
	Wt. score	0.00	0.00	0.00	10.00	0.11	0.00	0.75	0.00	0.00	0.00	0.47	0.00
8.	No. of consultancy assignments undertaken	1	2	2	2	0	0	2	97	8	-	4	4
	Wt. score	0.10	0.21	0.21	0.21	0.00	0.00	0.21	10.00	0.82	0.00	0.41	0.41
9.	Farmers directly benefited with value addition	0	0	4	0	37	30	20	265	-	-	1340	90
	Wt. score	0.00	0.00	0.03	0.00	0.28	0.22	0.15	1.98	0.00	0.00	10.00	0.67
10.	No. of local employment generated (direct) through incubatees	0	420	35	0	2	10		0	-	-	100	
	Wt. score	0.00	10.00	0.83	0.00	0.05	0.24	0.00	0.00	0.00	0.00	2.38	0.00

Sl #	Indicator	CIAE	CIBA	CIFA	CPCRI	CIPHET	CPRI	CRRI	IIHR	IISR	IIVR	NAARM	NDRI
11.	No. of mergers & acquisitions, joint ventures, tie-ups made	3	0	0	0	6	0	0	31	10	-	9	0
	Wt. score	0.97	0.00	0.00	0.00	1.94	0.00	0.00	10.00	3.23	0.00	2.90	0.00
12.	BPD surplus fund (Rs. million)	0	0	0	0		0	0	0	-	3.996	0	
	Wt. score	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00
13.	a. Number of applications filed for patent	2	2	0	0	4	2	0	2	6	1	1	NA
	Wt. score	3.33	3.33	0.00	0.00	6.67	3.33	0.00	3.33	10.00	1.67	1.67	0.00
	b. Number of patents granted	0	2	0	5	0	0	0	0	-	-	0	NA
	Wt. score	0.00	4.00	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14.	Number of scientists trained overseas in the frontier areas of science	0	2	0	0	0	0	0	0	-	-	0	
	Wt. score	0.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15.	Number of scientists trained overseas in consortium-based subject areas	0	0	0	0	0	0	0	0	-	-	2	
	Wt. score	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
16.	No. of scientists participated in conference/seminar etc. abroad	0	0	0	0	0	0	0	0	-	-	3	
	Wt. score	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00
17.	Number of novel tools/protocols/ methodologies developed	8	0	3	0	0	3	0	1	7	-	13	
	Wt. score	6.15	0.00	2.31	0.00	0.00	2.31	0.00	0.77	5.38	0.00	10.00	0.00
18.	Publications												
	Articles in NAAS rated journals	2	0	0	0	0	0	nil	0	-	-	2	
	Articles in other journals	1	0	2	0	2	0	nil	0	-	-	4	

Sl #	Indicator	CIAE	CIBA	CIFA	CPCRI	CIPHET	CPRI	CRRI	IIHR	IISR	IIVR	NAARM	NDRI
	Book(s)		0	0	0	0	0	nil	0	-	-		
	Book chapter(s)		0	0	0	0	0	nil	1	-	-		
	Thesis		0	0	0	0	0	nil	0	-	-		
	Popular article(s) (English)		2	0	0	1	0	nil	0	3	-		
	Newspaper article(s)	1	0	13	1	2	0	1	4	5	-		
	News Clippings		0	0	0	28	0	2	0				
	Seminar/Symposium/Conference	16	0	2	6	8	1	nil	0	8	-	7	
	Technical bulletin(s)	1	0	0	0	0	1	nil	0	-	1		
	Manual(s)	10	0	1	0	0	0	nil	1	1	-		
	CDs/Videos	2	0	0	0	0	0	nil	2	-	-	6	
	Popular article(s) in other language	2	0	1	0	1	0	0	-	-	4		
	Folder/Leaflet/Handout	9	14	10	10	16	10	9	1	1	9	4	
	Report(s)	1	0	0	2	0	1	2	-	-	2	1	
	Success stories	0	3	0	0	0	0	4	4	1	-	7	
	MOU Signed	0	0	0	0	6	0					0	4
	sub-total (publication)	45	5	19	19	64	13	18	13	19	16	31	4
	Wt. score	7.03	0.78	2.97	2.97	10.00	2.03	2.81	2.03	2.97	2.50	4.84	0.63
		CIAE	**CIBA**	**CIFA**	**CPCRI**	**CIPHET**	**CPRI**	**CRRI**	**IIHR**	**IISR**	**IIVR**	**NAARM**	**NDRI**
	Wt score total	**27.07**	**43.62**	**9.46**	**33.58**	**31.57**	**25.89**	**7.50**	**78.11**	**25.77**	**16.12**	**58.90**	**13.27**

The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political international organization that conducts agricultural research for development in Asia and sub-Saharan Africa with a wide array of partners throughout the world. It belongs to the CGIAR Consortium.

Agri-Business Incubation (ABI) Program is a public/private partnership initiative of ICRISAT, in partnership with National Science and Technology Entrepreneurship Development Board (NSTEDB) of Department of Science and Technology, Government of India. ABI Program supports agribusiness entrepreneurs with agri-technology, consultancy, business development, infrastructure and networking.

The Indian Council of Agricultural Research (ICAR) is an autonomous organization under the Department of Agricultural Research and Education, Ministry of Agriculture, Government of India. The Council is the apex body for coordinating, guiding and managing research and education in agriculture including horticulture, fisheries and animal sciences in the entire country.

National Agricultural Innovation Project (NAIP) is a World Bank aided project of ICAR to provide technological support to farmers through development of new strategies, technologies and innovative solutions to address the changing agricultural environment. ICAR through NAIP aims to develop the R&D system to find new ways of doing business in agriculture and allied fields to achieve the objectives of increased productivity, poverty alleviation, and nutritional, livelihood and income security.

Network of Indian Agri-Business Incubators (NIABI)

Creating opportunities for agri-business ventures to take off

About ICRISAT

ICRISAT Science with a human face

International Crops Research Institute for the Semi-Arid Tropics

ICRISAT is a member of the CGIAR Consortium

The **International Crops Research Institute for the Semi-Arid Tropics** (ICRISAT) is a non-profit, non-political organization that conducts agricultural research for development in Asia and sub-Saharan Africa with a wide array of partners throughout the world. Covering 6.5 million square kilometers of land in 55 countries, the semi-arid tropics have over 2 billion people, of whom 644 million are the poorest of the poor. ICRISAT innovations help the dryland poor move from poverty to prosperity by harnessing markets while managing risks – a strategy called Inclusive Market-Oriented Development (IMOD).

ICRISAT is headquartered in Patancheru, Telangana, India, with two regional hubs and six country offices in sub-Saharan Africa. It is a member of the CGIAR Consortium. CGIAR is a global research partnership for a food secure future.

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