

Rise of a New Era:

Strengthening of Indian Agriculture by Virtue of Agribusiness Incubation

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Agriculture is considered as a noble profession in our country since ages. The farming activity had always been enterprising by its nature of providing a scope for innovation in terms of practices adopted or the resources used. Agricultural research and innovation had been making its mark since many years before the formal establishment of agricultural research system in the country. Since green revolution, it has taken its rapid pace and made India self-sufficient in food production. At the same time, many problems and challenges have also arisen that need serious attention i.e., soil degradation, agricultural waste, less availability of water for irrigation, post-harvest losses and many others.

Key words: Agribusiness, Internet of things, Pusa Krishi Incubator, Startup India Portal

AGRIPRENEURSHIP is an important link in converging various disciplines into agriculture, bringing out solutions to its troubling challenges and make them reach to its users. Only 16.8 % founders of agri based startups belong to agriculture and allied sciences as their core discipline of qualification. This figure highlights the importance of agribusiness incubators in two ways i.e. strong guidance to the founders regarding minute details of agribusiness and orienting agricultural students towards agripreneurship. These startups generate fabulous technologies that have great applications in agriculture. But at the same time, they lack expertise in the way it should be applied to overcome the challenges of Indian agriculture. An agribusiness incubator is the place that provides every support to nurture these startups to make their idea a viable business entity. As per the data obtained from Startup India website, there are 456 incubators registered in our country out of

which 100 provides business incubation in agriculture and allied areas.

ICAR-IARI has taken steps in establishing its tech transfer office 'Zonal Technology Management Unit' in 2009 with the support of ICAR. In 2014, coupled with ICAR's ambitious National Agricultural Innovation Project (NAIP), a foundation for agribusiness incubation was laid and the unit was renamed as 'Zonal Technology Management and Business Planning & Development Unit'. The unit operates as IP management and tech transfer office at the Institute level and hand holding unit for other ICAR institutes at the zonal level. At the same time, it works as an incubation facility for nurturing ideas into commercially viable start-ups.

To give impetus to innovative research and its applications, in 2017, ICAR launched its new scheme National Agriculture Innovation Fund (NAIF) and created incubation fund under the same. Simultaneously after gaining a good experience and

crossing some milestones, the unit has become a DST supported Technology Business Incubator (TBI) in 2018. In the same year it has made its mark by becoming Knowledge Partner (KP) in DAC&FW's ambitious scheme 'Rashtriya Krishi Vikas Yojana-Remunerative Approaches for Agriculture and Allied Sector Rejuvenation's (RKVY-RAFTAAR) Innovation and Agri Entrepreneurship Cell'. 'Pusa Taksay Society' has been registered with the Registrar of Societies, New Delhi and is progressing on the way of shifting all of its agribusiness incubation activities under it by making it a one stop solution for startups. The incubator was named as 'Pusa Krishi Incubator (PKI)' by continuing the 114 years of IARI's legacy. The unit has been in a close connection with various government wings i.e., DAC & FW, Ministry of MSME, Technology Development Board, various embassies and few international organisations. Its long association with industry giants also supports its startups to pilot, network

and be guided in their venturesome journeys. Currently, the unit operates under three verticals i.e., IP Management, Technology Commercialization and Agribusiness Incubation.

Agribusiness incubation and acceleration programs

The unit operates through a foray of incubation and acceleration programs under which it nurtures agri startups to reach to new heights. To streamline all of its incubation and acceleration related activities, the unit formulated 'Pusa Krishi Incubator' in 2019.

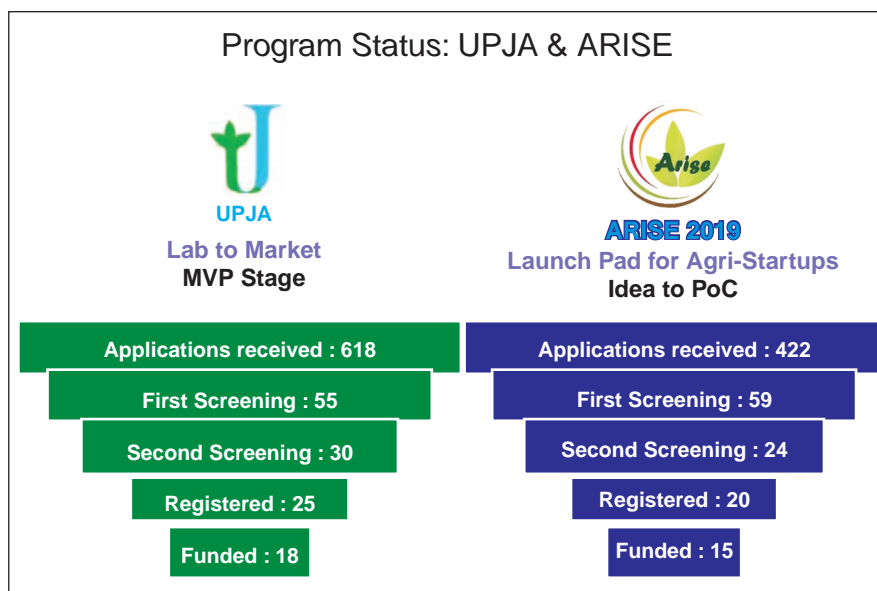
Focus area for incubation: Under its various programs, it supports startups under the mentioned thrust areas:

- Farm mechanization
- Biotechnology and bioinformatics
- Post-harvest processing and food technology
- Agricultural inputs
- Agri and food supply chain
- Natural resource management
- Precision farming, artificial intelligence and machine learning
- Internet of Things (IoT) and Information and Communication Technology (ICT) in Agriculture
- Agri allied areas

Facilities provided to the incubates: The unit has so far worked with 100 incubates under its various programs and assisted them with a plethora of services and guidance. A brief checklist of the support provided is given in Table 1.

Table 1. Support pillars of Pusa Krishi Incubator comprising provision of services to incubates

Infrastructure support	Technical support	Business support
<ul style="list-style-type: none"> • Incubation Office space • Training Room • Meeting Room • Conference Room • Internet and communication facility • Video conferencing facility • Well equipped Laboratories: Biotechnology, Tissue Culture and PHT 	<ul style="list-style-type: none"> • Technology Commercialization • Technology Development • Technology Validation and Field Trials • Technology Upscaling • Technical Mentoring and Backstopping • Agripreneurship Development Programs (ADPs) 	<ul style="list-style-type: none"> • Pre-incubation consultation • B Plan Development facilitation • Training to develop business skills • Business Mentoring • Secretarial Services • Market Assessment/ research • IP Services • Fund Facilitation • Assistance in running market feasibility and financial feasibility studies • Fund Facilitation



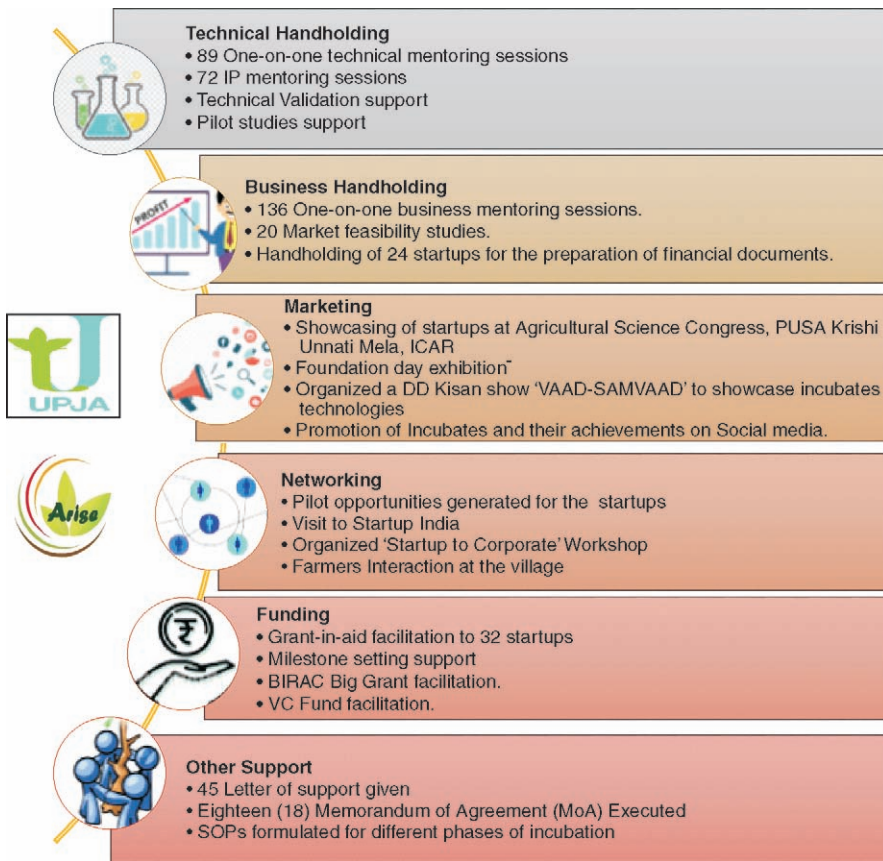
Selection Funnel for the programs 'UPJA' and 'ARISE'.

Modus Operandi of PUSA Krishi Incubator

- **Selection process:** The Incubation or Acceleration Programs are carefully curated at PKI with a stringent selection process. Whenever the call is made open for entrepreneurs to apply for a particular program, the applications are being invited on various online forums i.e. Startup India Portal, F6S, Incubator's website and offline. The received applications are then screened on the basis of their technical feasibility and business potential. The incubator has a huge network of scientists and business evaluators that evaluate the applications. After first screening, the qualified entrepreneurs based

upon the order of merit are being called for second round of the selection process. In this round they are being asked to make presentation of their offering with its detailed information in front of the selection panel. The panel evaluates every detail of the technology, financials and team of the startups and selects few. These selected startups then become the incubates of PKI under that particular program.

- **Incubation process:** The selected startups are then being facilitated with either letter of support or MoA depending upon the program. The startups then undergo a compulsory incubation/acceleration workshop whose duration may range from seven days to two months as per the program. These workshops comprise of detailed one-on-one mentoring sessions with technical and business mentors, expert lectures, interactions with farmers, industry giants, policy makers and regulatory machinery. The composition of the workshops and relative intensity of its various facets vary as per the batch's requirement and stage of development. The mentoring sessions are need and milestone based and are being conducted on each and every aspect of a business i.e. Intellectual Property (IP), Marketing and Distribution, Finance, Valuation and Business



Key achievements of 'UPJA' and 'ARISE'.

Modelling. After the workshop either they are being incubated for asset duration of time or they are virtually associated with a curated mentoring process for the set duration or till fund facilitation.

Current programs: Currently the Incubator is running four programs for its different clientele as given.

- **SAMARTH - Innovation and Incubation Induction Program:** It is a curated Incubator handholding and capacity building program that is inculcating the values and standards of agribusiness incubation in budding incubators. A total of 28 incubators got benefitted out of it. It has held four carefully designed workshops for Incubator heads, its managers and other professionals. Various sessions on Incubator planning and management, marketing, processes and protocols of incubation, funding and frontier areas have been executed. The discussions with industry specialists and Policy-makers was the highlights of the workshops. Apart from the workshops, handholding of the RAFTAAR Agribusiness

Incubators was done by participating in their selection process of startups, developing their processes and protocols and physical visits at their centers.

- **UPJA- Launchpad for Lab to Market:** This is an acceleration program that was designed for the startups that have reached to the stage of making Minimum Viable Product (MVP). These startups

have been selected by standard protocol of the incubator as described earlier. The startups belong to various sub-sectors of agriculture including precision farming, mechanization, food processing, biotechnology and allied agricultural activities and thriving to make their technologies reach out to Indian farmers. Under this program, a two months in-residency workshop was conducted and eighteen (18) startups were funded with a grant-in-aid up to 25 Lakh INR. The facts of the selection process is given in figure.

- **ARISE- Launchpad for Agri Startups:** This is an incubation program organized for idea/prototype stage startups to reach to a level of product development. Arise 2019 also held a two-months in residency workshop and the funding assistance was up to 5 lakh INR to 15 startups. These startups are in the process of developing solutions to change the face of Indian agriculture. The combined key achievements under both the programs are illustrated.
- **MAITRI- Indo-Brazil Agritech Cross Border Incubation Program 2019-20:** It is a cross country agri business incubation program that is being operated in collaboration with Brazilian embassy. To excel the best of talent, technologies and start-ups across both nations, this program aims at promoting innovation in Agri

Key Facts	Incubation	Acceleration	Events	Funding Support
10 Patents applied	1500 + Applications	650+ Startups	24 Workshops	36 Start ups grand-in-aid (32)
43 Tech Comm. to startups	50 + Incubates	22 Startups	26 ADP	₹ 890 lakh equity funding (4)
Pan India coverage	₹ 4500 lakhs Topline	₹ 5600 lakhs Topline	27 Events	₹ 515 lakh
International coverage: African and South Asian Countries	1623 Direct Emp.	537 Direct Emp.	9 Field Days	
741 Focused session	5665 Indirect Emp.	7897 Indirect Emp.	19 Trainings	
146 one-on-one sessions	10 lakhs Farmers connect	4 lakh Farmers connect	5453 Entrepreneurs	
Founders : 45% MBA				
27% PhD., 22% IT Graduate				

Key facts of incubation and acceleration programs.

sector to explore synergies across both countries. Under this program, five startups were selected by each country that will supposedly explore the market opportunities in the other country. A 15 days incubation workshop in both of the countries separately was an essential part of the program that introduces the startup ecosystem, various regulatory parameters being followed in that country, insights about the customers, networks, distribution channels etc. The workshop in India has already been conducted and the one-on-one mentoring sessions to refine their business model and other variables as per the Indian situation was the strength of the program.

- **Agripreneurship Development Programs (ADPs):** It is another wing of the incubator that provides entrepreneurial skills on proven technologies to people who don't have an idea to build a venture

around. These are fixed duration programs ranging from three to ten day where anyone can participate and learn how to venture in for a particular technology, product or an area. So far, 34 ADPs have been conducted in various areas including IP Management, Seed Production, Soil Science, Agricultural Chemistry, Tissue Culture, Post-Harvest and Food Technology, Biofertilizer formulation, Biopesticides and others and 424 participants got benefitted.

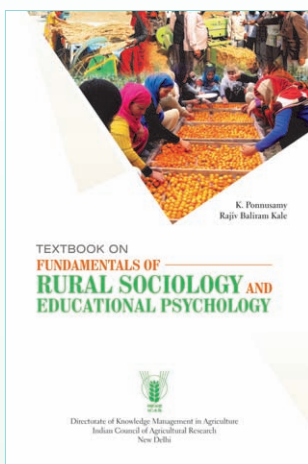
A summary of the key facts of the incubation and acceleration programs is depicted in figure.

Road ahead: The Incubator is creating its mark in the country's journey of taking Indian agriculture to an advanced level by the virtue of agripreneurship. It believes in taking all the stakeholders together and creating a comprehensive value. Hence, it gives immense impetus to make connections by the virtue of

various workshops, training programs and dialogue events with corporate, farmers, policymakers and others and will continue with the same in the future. It is going to drive on the roads of developing innovative startups for the most typical challenges of Indian agriculture with full enthusiasm. It will work on bringing the indigenous technologies on the global forum and simultaneously help global technologies to reach to Indian Farmers. The Incubator also holds a vision to strengthen the agribusiness incubation ecosystem by nurturing budding incubators with the help of various stakeholders and it firmly believes that combined efforts of everyone whomsoever associated will make the ecosystem reach to new heights.

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Textbook on Fundamentals of Rural Sociology and Educational Psychology



India being a land of villages, rural sociology and educational psychology is an essential theme for agricultural students and professionals. Rural sociology deals with rural society and the relations of people who live in villages. Rural sociology presents a scientific picture of rural life.

Extension workers work with farmers very closely in their settings for which their understanding of rural background and farmers' psychology is very essential. Extension professionals should have necessary knowledge of the precise approaches and methods of dealing with farmers. Rural sociology can help professionals in organizing the rural structure in a constructive manner.

This textbook consists of fundamental facts of rural sociology. The book has twenty two chapters covering both rural sociology and educational psychology out of which twelve chapters consist of rural sociology and ten chapters deal with educational psychology. In this text book, emphasis has been given on various aspects of educational psychology also. It provides all the relevant information in the field of rural sociology with special emphasis on Indian culture, merits and demerits of Indian rural societies, the stressful conditions under which farmers live and work. The book will be a good basis of information reference for agriculture students, psychology students besides extension practitioners, research scientists, KVKs and agricultural colleges.

TECHNICAL SPECIFICATIONS

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