

Smart Farming & Entrepreneurship Development in Agricultural Universities

INTRODUCTION

It is well acknowledged that it was the success of Green revolution saga that led to the country becoming more a food-secure country today. The contributions from agricultural research, education and extension systems to this achievement are indeed unparalleled and these institutions need to take their stewardship efforts with newer approaches to bring in the next



wave of transformation of the agricultural and food sector. This transformation is warranted as not only challenges for more food continue but demand for better and nutritional, safe food with a sustainable approach to use natural resources grows. Added to these, agriculture needs to be pushed as profit oriented industry for all its stakeholders in agri value chain especially the farmers. Enhancing livelihood capabilities in farm sector and non-farm sector is the fundamental premise of the national agenda of doubling farmer incomes in the next decade.

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THE PUSH VS PULL FACTORS OF THE AGRICULTURAL PRODUCTION SYSTEMS

Despite these successful macro indicators, the grass root level challenges remain challenged in India, with nearly 16 Million farmers, of which 88% are small & marginal farmers (~88%) facing crucial access to quality information/ decision making tools for management of farm activities. In an agrarian economy such as India, with more than 50% of the population depending on agriculture as a main source of income, this demand-supply tug-of-war continues to result in skewed pricing for several crops including excessive wastage of crops produce for lack of good price. Decreasing availability of farming land, unpredictable rains and depleting groundwater and urban migration of labour have opened new opportunities for tech-enabled warehouse management, and rapid adoption of IoT and modern agriculture practices, which can give visibility to this crucial supply chain.



One of major lessons in COVID phase was the identification of several vulnerabilities in demand-supply chain of agrivalue chains and exploration of technology-driven tools for decision making. The promise which neo technologies bring envisions the transformation of this primary sector to the next level of farm productivity and profitability. In fact new developments in the discipline of precision Agriculture, leading to applying inputs precisely a when, what where scenario is fast becoming the base of third wave of the modern agriculture revolution . This enhanced farm knowledge systems due to the availability of larger amounts of data and new technologies like CRIPR, genomics etc are the innovative possibilities of push factors to better the sustainable farm production activities. And pull out food /nutritional security with better efficiencies and predictabilities.

IS SMART FARMING A POSSIBILITY?

Managing farming more efficiently through Smart Farming enables the farmers to get precise information inputs and help in accurate decision making on various farming issues such as sowing, irrigation, pest & disease management, harvesting till market entry. Smart farming employs precision farming technologies that captures data and also provide actionable insights for farming with high degree of predictability and precision .

While solutions are now emerging at each level, the adoption of these across farmer-technology developer platforms is being realized as a major challenge. The technological driven solutions with new tools of AI, robotics and other tools gear for building new level of human resources including farmers, agri-service providers with capacities and competencies to apply these tools.

In the quest to provide smart farming solutions to the farmers, multiple entrepreneurs have been foraying in to the Agritech space and are offering a range of tech based products and services to the farmers.

THE BOOMING AGRITECH STARTUPS

Since the advent of the Startup India initiative in 2015, the country has witnessed a wide number of Agripreneurs entering this space, which led of innovative startups sprawling up (~3200 startups registered under startup India initiative as Agri startups and ~735 startups matured in Agritech. Agritech or agriculture technology can be products, services or applications derived from agriculture to advance a range of input or output processes associated with agriculture. Agritech involves a broad array of technologies, including drones, satellite photography and sensors, IoT-based sensor networks, phase tracking, weather forecasts, automated irrigation, light control, and heat control, intelligent software analysis for pest and disease prediction, soil management and other involved analytical tasks, and biotech. Multiple agritech startups are foraying into the sector offering innovative and personalised solutions at affordable costs to tackle various challenges in the agricultural value chain . However, current data indicates that majority of these startup founders are from Non Agriculture background and there is lack of Agri graduates venturing into entrepreneurship. Concurrently, it is important to understand the growing demand for more centralised databases of agri data or an agritech stack, for the technology developers to have access to. It is increasingly becoming crucial for the stakeholders like Government, agritech startups, agri-food supply chain companies to work on a common platform for a more transparent, digital mode in the agri demand-supply chain, thereby minimising losses across the value chain.



THE EMERGENCE OF INCUBATION PLATFORMS

The Startup India initiative in the country has indeed contributed to the growing numbers of incubators/ accelerators in the country. From about ~60 incubators in 2015 there has been six-fold increase to nearly ~350+ incubators till date. However, majority of these incubators have been focused in domains other than Agriculture, with very few operating exclusively in this domain. Majority of the newly emerging Agri incubators in the country are housed in National or International Level Institutions (on the likes of AIP at ICRISAT, a-IDEA at NAARM, Pusa Krishi at IARI, and SINED at NDRI, Best Hort. at IIHR etc. In case of State Agricultural Universities, the number of incubators are much lower. Except for pioneers like ABD at TNAU, Coimbatore or MABIF at Madurai or ABI at CCSHAU, the overall numbers across 71+Agricultural Universities in the country are very low. The rapidly developing Agri entrepreneurship ecosystem brings a huge opportunity for building entrepreneurial ecosystem in these Universities to

motivate and inspire young Agri graduates and post graduate onto entrepreneur-laden career pathway. Equally important is create an enabling ecosystem to help the entrepreneurs from non Agri sectors venture to this space. It is important that Universities create a vibrant innovation system by using the ecosystem and expertise that lies with the Universities through innovation-incubation-acceleration nexus and catalyse early and late scale stage enterprises into agri-fold. The basic premise for this is that good ideas alone will not deliver new products or practices that transform agri innovations. Managing the innovation process is crucial as disruptive innovation requires different mindsets and approaches. With uncertainties a constant element of the agri ecosystem, any translation of ideas across the value chain needs higher level of collaborations and consistent engagement with the stakeholders. This is a transgression from past models of technology adoption by farmers through conservative extension practices and therefore needs attention from Administrators, researchers and the wide range of stakeholders.

CREATING AN ECOSYSTEM FOR PJTSAU WAY

Against this background, the Professor Jayashankar Telangana State Agriculture University (PJTSAU) has created a Special Purpose Vehicle named AgHub Foundation (branded as AgHub), a Section-8 Company to promote innovation and entrepreneurship in Agriculture. The AgHub is a first of its kind incubation Centre, operates in a Hub and Spoke model, where the Innovation Hub centered in the University and rural spokes at the tier2/tier3 cities of the State. While the Hub supports Agritech startups through Innovation-Incubation-Acceleration of the startups PAN India, the rural innovation centers of the AgHub cater for the promotion of rural entrepreneurship for building Agribusiness enterprises promoted by rural youth, women, farmers and FPO's etc. Realizing the need for promotion and piloting of grass root innovation and to ensure dissemination of the innovations at the grass root level, AgHub has recently launched a flagship program called Agritech Innovation Pilots (AIP). This is a First of its Kind Innovation Program to enable soft landing or piloting of innovations of the Agritech startup to the farmers/ FPO's ,thus ensuring ensure last mile delivery of innovations at the grass root level.

The AgHub focus is on producing entrepreneurs from wide range of backgrounds Rural vs Urban, startups vs enterprises, entrepreneurs vs student entrepreneurs, with a special focus on women entrepreneurship. The AgHub aims at creating a congenial ecosystem for promotion of a wide range of Agritech startups as well a Agri enterprises. One of the key areas of focus of the AgHub would be in the development and promotion of entrepreneurship ecosystem in the University, the State of Telangana and also to scale up Agri tech startups in Global arena.

As an incubator, AgHub leverages the PJTSAU's ecosystem of Research, education and extension institutions to build innovation and entrepreneurship among startups, entrepreneurs and young Agri graduates /post graduates along with promotion of rural entrepreneurship. Added to this, the proactive efforts of the Govt. of Telangana's innovation policy across all the sectors and its focused Agri Innovation initiatives on the likes of Artificial Intelligence for Agricultural Innovation (AI4AI) programme to boost agricultural developments and many such initiative add further fillip to the Agri startup & Rural entrepreneurial ecosystem to grow and nurture at AgHub of PJTSAU.

In the coming time the AgHub at University plans to expand its operations and build innovative technology-based start-ups at its Innovation Hub and fuel rural entrepreneurship in its innovation spokes.

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