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Role of AgriTech Startups in India's Agricultural Landscape

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Abstract: *The research explores the role of AgriTech startups in agricultural economy. The study aims to provide a comprehensive understanding of the current state of AgriTech entrepreneurship in India. The study used secondary data from the official websites of government and include case studies of agritech companies for the better understanding of their operations and dynamics. Moreover, an attempt has been made to understand the major challenges faced by Agri entrepreneurs in India and also provide the recommendations to address these issues for the benefit of small and marginal farmers, stakeholders and the economy as a whole.*

Keywords: *Agri Tech, Entrepreneurship, Dynamics, Challenges, Small and Marginal Farmers, Stakeholders.*

I. INTRODUCTION

Agri Tech startups in India are driving a transformative shift in the agricultural economy by leveraging technology to bring about significant changes in various aspects of agriculture, leading to enhanced value creation and productivity. The tech market for supplying farm input is alone expected to be as big as \$1 billion. These startups are at the forefront of introducing pioneering solutions to address the constraints encountered by the small and marginal farmers in the agricultural sector. These agritech start-ups have contributed to reducing price of produce, generating employment opportunities in rural areas and ensuring timely delivery of produce to consumers by eliminating intermediaries and streamlining supply chain(Jadhav & Moharekar, 2022). "Digital India" an initiative by the Government of India aim to bridge the gap rural-urban divide, making the farmers aware about the latest advancements in the agriculture sector and providing internet connectivity(OECD). The agritech landscape in India has significantly grown from 2013 to more than one thousand in 2020. Increasing awareness in farmers, rise in Internet penetration in rural India boost the need for greater efficiency in the agriculture sector. By introducing innovative farming technologies, providing access to modern technologies, these startups play a pivotal role in ensuring India's food and nutrition needs while simultaneously boosting the capabilities of nation and strengthening its position on the global level(Dubashi et al., 2023).

II. REVIEW OF LITERATURE

The paper addresses the significant impact of agritech startups on the advancement of Indian agriculture. It highlights the continuous endeavors of government to enhance the agricultural productivity, foster food processing and expanding market opportunities through technologies and inventive solutions (Meena et al., 2019). A positive transformation of Indian agriculture through agritech startups have been observed. The paper highlights the startups are harnessing technology to strengthen retailing, Business-to-consumer (B2C) and business-to-business (B2B) and digital agronomy platforms(MANAGE-Centre for Agricultural Extension Innovations, Reforms). To ensure the success of agritech startups, the primary focus is to opt innovations and collaborate with the start-ups at the global level(Jadhav & Moharekar, 2022). Agritech companies operates across different segments based of the value chain, providing essential services related to storage, retailing and distribution by contributing overall growth and sustainability (GaneshKumar & Khan, 2021). The study discussed that the status of agritech startups is at their nascent stage and have realized only 1 per cent, it is expected to generate revenue of USD 24 billion by the year 2025 (Adhya & Sahoo, 2022). However, some major constraints faced by farmers including finance related, marketing and production oriented (Mandala et al., 2021). Agritech business models are in their early stage and can explore the possibilities of horizontal integration of stakeholders and association with farmers(Adhya & Sahoo, 2022).

III. RESEARCH OBJECTIVES

Following are the research objectives on the basis of the review of literature:

1) To analyse the role of agritech startups in agricultural economy

- 2) To study operational mechanism of selected agritech startups
- 3) To examine the constraints faced by the Agri entrepreneurs in India

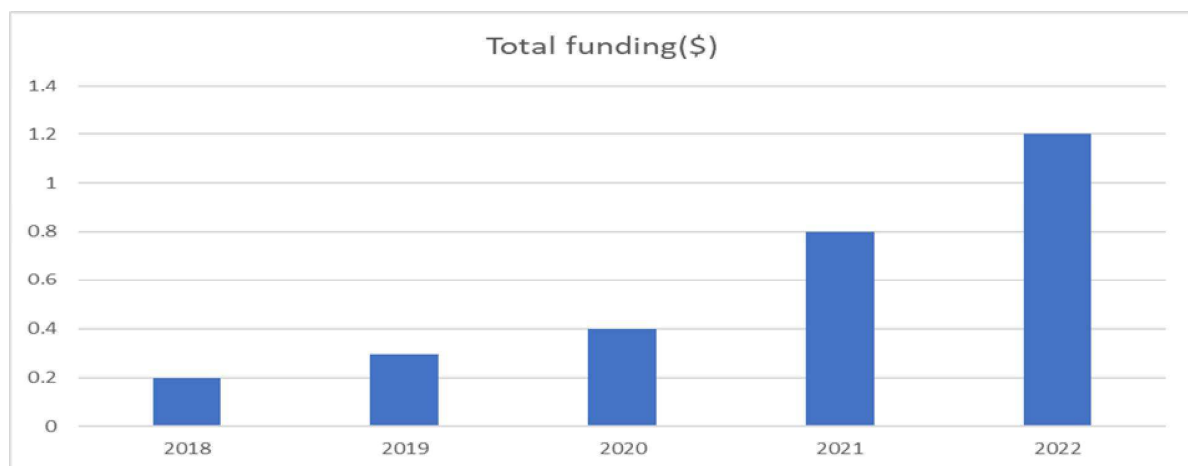
IV. RESEARCH METHODOLOGY

To analyze the role of agritech startups and constraints faced by the Agripreneurs in the agricultural economy, a review of extensive academic literature, research articles and government publications have been used to analyze the historical and current role of agritech startups in India. Several case studies of selected specific agritech startups have been analyzed to examine their operational models and business strategies for a comprehensive understanding.

V. RESULTS AND DISCUSSION

A. Growth and trend of Agritech startups through Venture Funding

The growth and trend of agritech startups through venture funding have been significant over the past few years. Some of the top fund raisers in the Agritech sector include Way Cool, AgroStar, NinjaCart, Bijak, Stellapps. These startups have been leveraging data analytics, machine learning, software as a service for addressing challenges in the supply chain, storage, payments, credit, packaging, advisory. The data provided shows the total venture funding by agritech startups from 2018 to 2022, representing the consistent growth in venture funding over the years, indicating investor interest and confidence in this sector is increasing. The significant rise in funding 2021 and 2022 could be due to various factors such as technological advancements, favorable government policies, increased demand for Agri solutions.



Source: McKinsey

B. Top Agritech Startups Case Studies

1) CropIn Technology

CropIn, established in 2010 by Krishna Kumar and Kunal Prasad, serves the solutions platform dedicated to empowering agribusinesses in enhancing their performance and sustainability. It delivers the weather data for facilitate the farm activities management and provide crop output, effectively minimizing risks and amplifying yields. By facilitating seamless collaboration among stakeholders at various levels of the agriculture ecosystem. These technologies facilitate the real time analysis, data interpretation and generating insights on standing crops. It can harness technology to drive digital transformation, regulatory compliance and sustainability. It has digitized over 5.5 million acres of agriculture, significantly impacting the lives of nearly 2.1 million farmers. Additionally, the company has analyzed data on more than 380 crops and 3,600 crop varieties across 46 countries spanning six continents.

2) Stellapps

Stellapps was founded in 2011 by Ranjit Mukundan, Ramakrishna Adukuri, a pioneering force in aiding dairy farmers and cooperatives to optimize their earnings through the digitization and streaming of milk procurement and cold chain management using their smart platform. It is specialized in the development of dairy management software that harness cutting-edge technology to enhance various aspects of the dairy supply chain. Leveraging big data, cloud computing, data analytics for improving critical



supply chain parameters in agriculture including milk procurement, production, insurance for animals, management in cold chain, streamlined payment of farmers.

3) *EM3 Agri Services*

EM3 Agri services was established in 2013, with the aim of providing affordable access to specialized agriculture technology for small and marginal farmers. The innovative approach involves offering rental services for specific agricultural devices for enabling farmers to boost production at a reduced cost. It employs a farming and service platform which comprises call centers, an app and also intermediaries for offline customers. Farmers can engage with EM3 to avail a comprehensive range of services to render farm operations spanning the entire production cycle. These services encompass diverse tasks such as transplanting, preparation of land, crop management, post-harvesting management. By leveraging farmers can conveniently schedule services, track the progress of work on their crops and conduct transactions. It continues to extend its reach across various Indian regions and fostering partnership with the local government and leading country as well as international equipment manufacturers to strengthen its operations and offerings.

4) *Way Cool*

Way Cool was launched in July 2015 by Sanjay dasari and Karthik Jayaram, a pioneering B2B agritech company with a vision to become the world's largest food and distribution company. Leveraging cutting-edge technology, Way Cool effectively manages the entire agricultural supply chain, covering farming inputs to the final delivery, thus enabling farmers to market their produce through diverse channels. It engages in the processing, procurement and distribution of fresh produce, essential commodities and dairy products. Through the strategic implementation of technology and innovation, it streamlines logistics and distribution services. The company has established a strong retail presence in Chennai, operating retail locations and e-commerce platforms for the development and branding of a diverse range of high-quality private label products through strategic collaborations. Way Cool effectively bridges the gap between farmers and consumers through a blend of physical infrastructure and information technology for enhancing the livelihood of small and marginal farmers.

5) *Intello Labs*

Intello Labs, established in 2016 by Milan Sharma, Devendra Chandani specialized in digital solutions. It owned various products including Intello Track, sort and Deep to harness the power of computer vision for assessing the quality of fruits and vegetables. It effectively monitors and grade the qualities of the commodities having vision to become the leading platform to facilitate the whole process entirely from the value chain, trade, grading, procurement to marketing. Intello Labs has established collaborations with entities including Reliance Fresh, Ocean Spray for its growth and to influence the entire agriculture industry.

6) *Bijak*

Bijak is platform which was founded in 2019 for empowering dealers and wholesalers to expand their businesses by facilitating the discovery of new suppliers, for processing of payments also working capital accessibility. It is functioning as a B2B market place for the commodities in agriculture and provide logistics for both buyers as well as sellers. As per the official website of the company, Bijak operates in over 27 states across India, including Uttar Pradesh, Maharashtra, Bihar and Punjab to facilitate trading in diverse range of the commodities for the contribution of growth and agriculture landscape.

C. *Constraints faced by Agri entrepreneurs in India*

Agripreneurs in India encounter numerous challenges which can hinder their success and growth of the agriculture sector. Some of the major constraints faced by Agri entrepreneurs are as follows:

1) *Financial Constraints*

Insufficient infrastructure such as lack of storage facilities, transportation and cold chain logistics imposes significant challenges for Agripreneurs often results in delay in delivery of produce to markets and post-harvest losses.

2) *Lack of Professional Support*

Lack of integration between farmers and market, lack of organizational support and management particularly in rural areas hinders their ability to leverage advancements in agriculture and competitiveness.

3) *Complex Regulatory Framework*



When dealing with agricultural practices and food safety standards, there is a significant challenge for agritech startups through the complex regulatory frameworks and compliance requirements,

4) *Inefficient Marketing and Distribution Channels*

Inadequate marketing linkages as well as inefficient distribution channels results in lower price realization of agricultural produce and increased costs due to inclusion of intermediaries.

5) *Exposure to Climate Change and Environmental Risks*

Agripreneurs challenges regarding climate change such as water scarcity, weather patterns, pest and disease spread are increasing. These environment risks significantly impact crop yields, profitability and farm productivity imposing threat to agripreneurial ventures.

6) *Resistance to Change*

Resistance to adopting new technologies and traditional farming techniques poses a barrier which are making efforts in introducing innovative solutions in the agriculture sector.

VI. CONCLUSION OF THE STUDY

The Indian agriculture sector is about to begin by using new and innovative technologies like IoT, AI and others. Various Indians and foreign agrotech players plays a vital in providing new technologies to the farmers. Agriculture technology is indispensable in accelerating India towards becoming a dominant force in farming. The prospects for the agritech industry are reshaping the current ecosystem for the advantage of society and all stakeholders. Government of India plans to implement a cluster-based value chain model for enhancing the cooperation among farmers, industrial inputs, states and market connections with a renewed focus on dairy, animal husbandry and fisheries to address the challenges faced in accessing the credit. Agritech companies operating in similar regions hold a substantial potential for the domestic and global expansion. Collaborations across borders can facilitate the transfer of technology to the underdeveloped economies for addressing food security concerns. With a robust innovation ecosystem and thriving agritech startups, India possesses a pool of successful agritech startups to lead the way in promoting cross borders collaborations at the global level.

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