Asian Journal of Agricultural Extension, Economics & Sociology

38(8): 1-8, 2020; Article no.AJAEES.58472
ISSN: 2320-7027

Pro-Agripreneurial Factors for the Formation of Agri-startups in India

Bhagya Vijayan[1*] and P. Sethuraman Shivkumar[2]

[1]Central Soil Salinity Research Institute, Karnal, Haryana, 132001, India.
[2]Central Tuber Crop Research Institute, Thiruvananthapuram, Kerala, India.

Authors' contributions

Both the authors together designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/AJAEES/2020/v38i830381
Editor(s):
(1) Dr. Zhao Chen, University of Maryland, United States of America.
Reviewers:
(1) Bealu Tukela, Hawassa University, Ethiopia.
(2) Santhosh Samuel Putta, Savitribai Phule Pune University, India.
Complete Peer review History: http://www.sdiarticle4.com/review-history/58472

Short Research Article

Received 10 May 2020
Accepted 14 July 2020
Published 28 July 2020

ABSTRACT

India has one of the largest Startup ecosystem in the World catering to approximately 10,000 Startups spanning from IT, finance to services. Since 2015, India's startup ecosystem has steadily matured with the startups diversifying their focus across a myriad of economic segments and has embraced technological innovation to meet the country's unique challenges. Indian ease of doing business ranking is 63rd in the World Bank Ease of Doing Business Index Report 2020. The Agriculture in India is witnessing a massive transformation with the focus on shifting to creating sustainable businesses to support the farmers. With the business focus, the agri-startups are leveraging opportunities in areas such as increasing crop production, improving the nutritional value of the crops, reduction in input prices for farmers, improving the overall process-driven supply chain, and reducing wastage in the distribution system, among others. They are also creating market linkages through retailing, B2C (Business to customer) and B2B (business to busines) market place management. This work reflects upon the deciding or the proactive factors contributing to the formation of Agri-startups spearheaded by youth in India.

**Corresponding author: E-mail: bhagyavijayan11@gmail.com;*

Keywords: Agri-starups; farming issues; youth; income.

1. INTRODUCTION

1.1 Growth of Agri-startups

The Agri-starups are infant companies, which are developing innovative products or services based on a marketable idea, but yet to establish a concrete business model [1]. They are often registered as a Private Limited Company, having up to seven years from the date of its incorporation/registration. The annual turnover should be maximum of Rs. 25 crores. As on April 2018, India has a total of 8,625 Startups of which 366 are focusing on agriculture (PWC and FICCI, 2018). The agristartups are working on three working spaces – AGRITECH, FOODTECH and Farming as a Service (FaaS) (Box 1).

2. CHANGES IN DEMOGRAPHIC COMPOSITION OF THE INDIAN POPULATION

Age-related factors play a crucial role in agricultural commercialization because food consumption by an individual changes over his/her lifetime. A recent survey indicates that India has the world's highest number of 10-24 years old, at 242 million, making it the largest youth population in the world (Swissnex India [2]). Considering the creativity, innovativeness and enthusiasm of youth, a National Policy for Skill Development and Entrepreneurship (2015) has been formulated, and several programmes were initiated to motivate them to create new ventures (Ministry of Skill Development and Entrepreneurship, Government of India).

3. GROWTH IN EXPORT OPPORTUNITIES FOR HIGH-VALUE AGRICULTURAL COMMODITIES

In the last few decades, India has mastered its export competitiveness in agricultural commodities, especially in high value products, making it the world's 14th largest agricultural, fishery, and forestry produce exporter. A report prepared by a not-for-profit organisation, the Centre for Environment and Agriculture (Centegro) indicates that Indian agricultural commodities exports are likely to grow to Rs 6507 billion by 2022 from the present Rs 2342.7 billion (The Economic Times Newspaper, 23 August 2017 [3]).

3.1 Box 1. Types of Agristartups

3.1.1 Agritech

Agritech startups deal with technological innovations and capabilities that change how food and other agricultural products are grown, harvested, packaged, stored, transported, processed and sold - making the farm-to-table process more efficient, sustainable and safe [4,5]. The agritech startups work in the following areas

- Upstream (Input) Marketplace model – Creating a platform for facilitating trade and other exchanges between farmer and agri-input agencies. It also includes providing materials and services which act as an input to farming such as seeds, varieties, nutrients, pest and disease management solutions etc.
- Downstream (Output) 'Farm-to-Fork' supply chain model – An integrated approach where the startups provide solutions for the food supply chain including production, marketing and value addition.
- Internet of Things and Big Data led innovation

a) Big Data - Using farm data to determine opportunities and key areas

- ✓ Farm management solution
- ✓ Risk mitigation and forecasting solution
- ✓ CRM and input channel solution
- ✓ Traceability and compliance

b) Internet of Things-enabled technology - Using IoT devices for remote monitoring and tracking

- ✓ Vertical farming monitoring solutions
- ✓ Hydroponic farming ecosystem to monitor humidity, air temperature, etc.
- ✓ Aeroponics system for smart farming

- Engineering led innovation – Providing engineering solutions to production and value chain problems
- Miscellaneous (Innovation in agri products, dairy farming) – Innovative ventures

3.1.2 Farming-as-a-service (faas)

Providing affordable technology solutions for efficient farming

Farm management solutions: Information sharing, analytics and precision farming tools.

Production assistance: On-site resources to aid production, such as equipment rentals.

Access to markets: Virtual platforms that connect farmers with suppliers of seeds, fertilisers and other agrochemicals, as well as consumers of their produce.

Source: FICCI (Federation of Indian Chamber of Commerce and Industry) (2018); Bain & Company and CIIE) [6].

4. EMERGING AGRI-FOOD RETAIL CHAINS

Retail industry in India is expected to grow to Rs 23400 billion by 2020 from the current level of Rs 21613 billion, registering a Compound Annual Growth Rate (CAGR) of over 10%. Grocery and food account for more than 50 percent of fast moving consumer goods (FMCG) sales and together form the biggest retail channel in India.

5. INCREASE IN THE FOREIGN DIRECT INVESTMENT INFLOW FOR AGRI-BUSINESSES

The FDI in agriculture is held in three sectors – food processing, agricultural services, and agricultural machinery. The food processing industry is one of the largest industries in India and ranks fifth in terms of production, consumption, and exports and contributes 14 percent of the Gross Domestic product of India. Food processing is a hallmark sector attracting FDI at an increasing level. FDI in the food processing sector rose from Rs. 3357 crores in 2014-15, to 4732.28 crores in 2016-17 (Press Information Bureau, July 2017).

6. ENTREPRENEURIAL ECOSYSTEM

An entrepreneurial ecosystem is the social and economic environment affecting the entrepreneurship at the local/ regional and national levels. It provides a framework to understand the ability of regional contexts to encourage and support the creation of new ventures. It plays a crucial role in nurturing entrepreneurship by regulating the key factors which drive them. The entrepreneurial ecosystem smooth functioning is determined by different elements - Individuals, groups, organizations and institutions that form a community by interacting with one another, along with environmental determinants like laws or policies or cultural norms, have a massive influence on how these actors work and interconnect. The entrepreneurship ecosystem as a whole or its elements independently has an immense role to be played for every individuals or group of individuals to be an entrepreneur. One of the most frequent useful entrepreneurship ecosystem models was developed by Daniel Isenberg. According to him, the entrepreneurial ecosystem consists of six domains, policy, finance, markets, human capital, support and culture (Fig. 1).

6.1 The Agri-startup Dilemma

Though Agristartups are emerging as a new wave in agripreneurship, and helping farmers to get assured prices, their sustainability in a long run is a huge concern for the governments who promote them. Data indicates that despite India's entrepreneurial strength, as many as 90 percent of startups fail within the first five years [7]. Many of the existing agri-enterprises, despite tasting initial success, are facing difficulties to expand their businesses beyond a point because of various reasons. Most of the reasons identified through various surveys are related to entrepreneurial ecosystem. A widely publicized survey by CB Insights conducted among 101 failed startups (CB Insights, 2018) indicate that they failed because of no market need (42%), ran out of cash (29%), not the right team (23%), get outcompeted (19%) and pricing/ cost issues (18%). A recent study conducted in Estonia [8] indicated that external factors like bad natural conditions, fluctuation of input and output prices, tough competition and government requirements along with internal factors such as lack of knowledge, insufficient equity capital, lack of current assets, poor or too optimistic business strategy and unprofitable primary activities lead to failure of agricultural firms. Blank (2008) indicated that high risk biotech firms fail due to insufficient funds and their inability to show high profit margin in a long-term.

Another research by Tsai and Erickson, [10] revealed that most early stage biotech companies in the United States failed due to lack of product efficacy and insufficient funds to meet regulatory requirements. While understanding

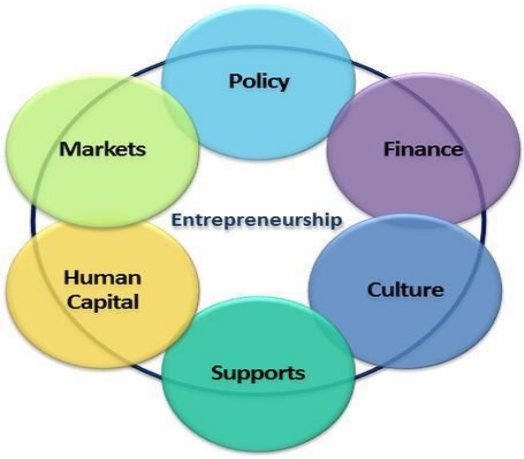

Fig. 1. Entrepreneurial ecosystem (Adapted from Isenberg, 2011 [9])
Source: https://www.forbes.com/

the factors led to the failures, it is essential to understand the critical factors which led to success of the surviving agristartups. As the success or failure factors are directly related to entrepreneurial ecosystem, it is essential to understand the critical factors of the ecosystem which contributed to the performance (success or failure) of agristartup. Startup stories are emerging approaches for documenting the entrepreneurial journey of startup entrepreneurs indicating the processes and their outcomes. The startup stories provide a comprehensive view of the success or failure of a startup and are increasingly being used as background materials in entrepreneurship development capacity building.

Currently various web portals like Your Story (https://yourstory.com/), The Better India (https://www.thebetterindia.com/), Ken folios (https://www.kenfolios.com/), The Outlook Business (https://www.outlookbusiness.com/), The Medium (https://medium.com/startup-foundation-stories) and many others regularly publishes stories of successful startup entrepreneurs. These stories provide valuable information on the genesis, progression and performance of various startups.

7. ENABLING AND PRO-FACTORS FOR HEALTHY AGRI-STARTUP ENVIRONMENT

The purpose of this work is to identify the critical factors which determine the creation and performance (success or failure) of agri-startups as indicated by the entrepreneurs. The present study followed the Qualitative Research approach using exploratory research design for identifying broad themes through thematic analysis from startup stories published in the web portals. Qualitative research attempts to provide multifaceted documented illustrations of how individuals experience a given research subject. Several studies on entrepreneurship have used a qualitative methodology (Lowder, 2009; Byrne and Shepherd, 2013; Singh, 2013). These studies explored entrepreneurial failures and how the participants perceived their state of failure and where they went wrong in their businesses. However, the current study will bring the critical success factors which contributed to the progression of the agristartups. Considering the nature of research questions, a exploratory research design was used in this study. The data were generated through a systematic search of startup stories published in the web portals.

Table 1. Inclusion and exclusion criteria of startup stories

Aspect	Criteria
1. Inclusion criteria	1. Stories published between 2010 to 2018. 2. Contains interviews or statements of owners about the genesis and performance of agristartup.
2.Exclusion criteria	1. Stories containing interviews without any reference on entrepreneurial ecosystem 2. Stories containing statements of the employees of the firm, without owners statements

Table 2. Profile of startups selected

S. no.	Name of the startup	Logo	Year of inception	Broad area of work
1	Stellapps	stellapps Smart Systems, Stellar Applications.	2011	IoT/Big Data led innovation
2	Flybird farm innovations	FLYBIRD FARM INNOVATIONS	2013	IoT/Big Data led innovation
3	Ecozen Solutions	ecoZen solutions	2009	Engineering led innovation
4	Siddhivinayak Agri Processing Pvt Ltd	SIDDHIVINAYAK AGRI PROCESSING PVT LTD SV INDIA	2009	Downstream (Output) 'Farm-to- Fork' supply chain model
5	EM3 Agriservices	EM3 Agri Services	2013	Farming-as-a- service
6	Frontal Rain Technologies Pvt Ltd.	frontalrain Software for Food and Agribusiness	2010	Downstream (Output) 'Farm-to- Fork' supply chain model
7	Arohan foods	CHOICE PORK NATURAL	2013	Downstream (Output) 'Farm-to- Fork' supply chain model

S. no.	Name of the startup	Logo	Year of inception	Broad area of work
8	BarrixAgro Sciences		2011	Upstream (Input) Marketplace model
9	Jackfruit 365		2013	Downstream (Output) 'Farm-to- Fork' supply chain model
10	Agricx Lab		2016	Downstream (Output) 'Farm-to- Fork' supply chain model; SaaS

Table 3. Factors enabling inception and creating success of agristartups

Aspect	Themes	Frequency (%)
1. Problem they are trying to solve and how big	To address problems in the supply chain - production, procurement and cold chain	50
	Climate change and resilience and Natural resource conservation	30
	Other issues	20
2. How did they get the idea? What motivated them to pursue the idea? Product-Market Fit Process	Availability and access to high level of technology to solve problems of agriculture	50
	From their own land or through observation of others problems	40
	Others	10
3. Who in your mind is your ideal customer when they entered the market? How it was changed?	Small and marginal farmers	80
	Other agencies in the agricultural value chain	20
4. How did you manage initial funding?	Bootstrapping at initial years	100
	Angel investors and venture capitalists	80
5. Who do You Perceive as Your Competition?	No similar products available	80
	Differentiating services	20
6. Challenges when started	Paucity of funds	90
	Inadequate government support	60
	Difficulties in reaching out the customer	50

7.1 Search Process

Before starting the literature mining, the conceptual boundaries were defined for choosing literature. Here the conceptual boundaries were limited to 'Agristartup ecosystems in India'. Based on the conceptual boundary, we identified key words 'Agristartup', 'startup', 'Agriculture', "entrepreneurial ecosystem" "start up stories" and 'India' for collecting relevant stories. Since the purpose of this research is to identify the critical factors which determine the genesis and performance (success or failure) of agristartups as indicated by the entrepreneurs, the following inclusion and exclusion criteria were used (Table 1).

One of the research questions this research addresses is the identification of emergent themes related to entrepreneurial ecosystem of agristartups. Therefore, all stories selected for this study were "unsolicited," i.e. the researchers did not provide a request for narratives to be included in the study, rather collected them from published stories based on researcher defined criteria.

The search process yielded 123 stories which were screened by the researchers based on relevancy, inclusion and exclusion criteria. Only stories with at least 10 lines of statements about agristartup entrepreneurial ecosystem were selected. Since the focus of the study is to analyze written material, all charts, videos, images, and hyperlinks were excluded from analysis. Only English language blogs which are available publically were included to prevent possible misinterpretation of content through translation. The names of the authors or interviewers or anyone who is not the founder of the agristartup were not included in the analysis. After rigorous screening process 59 stories were selected for analysis.

The Thematic Analysis was conducted following guidelines suggested by Braun & Clarke [11], i.e. (1) Become familiar with the data, (2) Generate initial codes, (3) Search for themes, (4) Review themes, (5) Define themes and (6) Write-up. This process was implemented by two researchers simultaneously. Since the research purpose was to identify emergent themes related to entrepreneurial ecosystem within the framework given by Isenberg [9] on six dimensions like policy, finance, culture, supports, human capital and market, the codes were extracted from the statements of the agristartup founders indicated in these stories. In this process, the researchers first read the manuscript, inductively coded data and worked together to create a code book. When the initial coding is completed, themes/ sub-themes were identified from the codes. After identifying the themes along with the codes, the researchers compared them for similarities. The authors ensured that the themes were internally consistent and represent their unique forms. All coded themes were included in the analysis, and quotes representing a specific theme are presented as exemplars of selected themes.

During the exploration phase of the study, ten agricultural startups were selected among the master list of 100 for detailed analysis of the factors enabling them to create agristartups and running them successfully. The profile of startups is given in Table 1. Among the agristartups, 50% focused on Downstream (Output) 'Farm-to-Fork' supply chain model, while 20% of IoT/Big Data led innovation, with 10% each of Upstream (Input) Marketplace model, Farming-as-a-service and Engineering led innovation.

The various factors facilitated the inception and success of agristartups is given in Table 3.

The results indicated that about 50% startups focused on supply chain issues, created business due to availability of state-of-art technology to solve agricultural problems, focused on small and marginal farmers (80%), initiated with own funds (100%) and developed unique and innovative products (80%).

8. FACTORS ENABLING INCEPTION AND SUCCESS OF AGRI-STARTUPS

The various factors facilitated the inception and success of agristartups is given in Table 3. The results indicated that about 50% startups focused on supply chain issues, created business due to availability of state-of-art technology to solve agricultural problems, focused on small and marginal farmers (80%), initiated with own funds (100%) and developed unique and innovative products (80%).

9. CONCLUSION

India agri-startup environment is plagued mostly by required motivation among the agri-graduates. The curriculum has to reframe to incorporate required acumen and exposure to

make graduates business minded. The miniscule percentage of agricultural graduates making ventures as their new vocation is disheartening for a nation which is generating thousands of agricultural graduates every year. To leverage youth to agriculture and allied ventures, the government should streamline the activities, then only India can make its demographic dividend, a blessing in disguise.

DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT AND ETHICAL APPROVAL

Research on the Internet presents ethical challenges, such as informed consent and maintaining anonymity (Marckham and Buchanan, 2012). However, that texts published on the Internet can be considered public (Marckham and Buchanan, 2012) and by making texts available on the Internet, blog owners give an 'implied consent'. Therefore, the authors refrained from requesting informed consent. The authors have protected and preserved the integrity and anonymity of the story owners by removing any details that could compromise their identity.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Available:http://documents1.worldbank.org/curated/en/688761571934946384/pdf/Doing-Business-2020-Comparing-Business-Regulation-in-190-Economies.pdf
2. Available:https://www.swissnexindia.org/annual-report-2015-on-its-way/
3. Available:https://economictimes.indiatimes.com/archive/year-2017,month-8.cms
4. Available:https://pib.gov.in/
5. Available:https://www.msde.gov.in/
6. Bain & Company and CIIE. Indian Farming's Next Big Moment: Farming as a Service; 2018.
   Available:http://ciie.co/documents/20143/43709/REPORT_Indian_Farmings_Next_Big_Moment Farming_as_a_Service
7. IBM. Entrepreneurial India: How startups redefine India's economic growth. IBM Institute of Business Value; 2016.
   Available:https://d1iydh3qrygeij.cloudfront.net/Media/Default/New%20release%20images%20and%20reports/Entrepreneurial%20India%20IBV%20mid%202016.pdf
8. Lukason O. Why and how agricultural firms fail: Evidence from Estonia. Bulgarian Journal of Agricultural Science. 2014; 20(1):5-11.
9. Available:https://www.forbes.com/sites/danisenberg/2011/05/25/introducing-the-entrepreneurship-ecosystem-four-defining-characteristics/#4e62fbbf5fe8
10. Tsai W, Erickson S. Early-stage biotech companies: Strategies for survival and growth. Biotechnol Healthc. 2006;3(3):49-53.
    Available:https://www.cbinsights.com/research/startup-failure-reasons-top
11. Braun Virginia, Clarke Victoria. Using thematic analysis in psychology. Qualitative Research in Psychology. 2006;3:77-101.

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sdiarticle4.com/review-history/58472