

Entrepreneurial drive for Sustainability: Agro Tech Startups

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Abstract—Urban India is flooded with various tech-Startups, rural India is still facing a drought situation in terms of innovative and tech- startups . This creates an imbalance in overall growth of the country as far as Tech start-ups contribution is concerned and raises the issue of future sustainable growth. Agro –tech startups are helping rural India to achieve its agricultural yield targets with IT, biotechnology, fertilizers, pricing forecasting models, farm equipment manufacturing, weather forecasting app, sowing advisories to farm output through web portals. Indian Agriculture sector is recession proof and is always in demand due to its huge size from sectors ranging from IT, retail, and biotechnology to fertilizers and farm-equipment manufacturing. With the demand for sustainability for coming future, this research paper tries to analyze the motivating as well as resisting factor from perspective of budding entrepreneur. This study tries to address the gap between motivating and resisting factors with integrating technology, start up and agriculture. For these youth wishing to become agro entrepreneurs can also take inspiration from successful startups. This research also tries to give suggestions to all stakeholders related to agro - tech startups ecosystem to cope the future challenges of Indian agriculture. The paper also discuss examples of few agro startups initiatives and development programs to increase the participation of budding entrepreneurs in the agriculture sector.

Keywords- Entrepreneurship; Start Ups; Agro -Tech Startups, sustainable solutions.

I. INTRODUCTION

With the aim of accelerating the startup wave in the country, current government schemes of Startup India and Standup India has become a global attention seeker for investors. India traditionally known for its Agricultural economy is now a target for business in search of technology. This has led to the new form of Startups called Agro Tech startups. Agro tech startups is defined as new business setup that uses technology for moving up the value chain of agriculture. These innovative technology boost the productivity and increase the output. Artificial Intelligence

technology is being used for crop and soil monitoring, supply chain efficiencies and predictive agriculture analytics. Autonomous robots used for farming though a far road to reach to country like India due to its high cost but provide continuous monitoring by using different sensing technology on crop status parameter like, micro nutrient availability, bio mass index, status of pest and disease, water stress, thermal stress etc. for better remedies of crops. (Kushwaha , et.al.2016).

Using Internet of Things technology for remote monitoring and tracking .Market linkage models to keep farmers updated about price, quality and market supply information. ((NASSCOM report on: Agri-tech in India, 2018).

Some of the successful startups using above technologies can be a motivating and inspiring guide to grab the attention of budding entrepreneurs from urban tech startups to agro tech startups. The startups like Agricxlab, Agrostar, Agrowave, Airwood, Arya collateral, Boheco, Crofarm, Cropin, Daybox, Em3 Agriservices, Farm Taaza, Farmart, Farmizen, Farm link, Gobasco, Goldfarm, Gramophone, Khethinext,Kisanhub, Krishi hub, Ninja cart, RML Agtech, and many more are some of the recent Agro Techstartups in various farming inputs like storage, improving supply chain, quality seed procurement, increased production, logistics and distribution(Dipti Nair2018).

Apart from it, big players like TCS, Techmahindra, Infosys, Cognizant, Accenture and ITC are also focusing in this area. As far as opportunities are concerned, Agro tech sector is flooded with huge funding support, Government incentives schemes, attractive investment option, incubators, and accelerators to boost entrepreneurial drive. But the main challenge it to take full use of these opportunities by the budding entrepreneurs. Budding entrepreneurs still resist and abstain themselves to move in agribusiness setup.

II. LITRETURE REVIEW

In current scenario the number of youth (mostly in final year of graduation) want to be engage in startups, is increasing (Pihie, 2009). Youth want to be their own boss and doing business on their own is their passion. Moreover earning and market gap also motivating factors for entrepreneurs is earning a living, passion, being their own

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boss and market gap. However, having own startups can be a result of their inner qualities of being an entrepreneur, knowledge, education, unemployment issues, job dissatisfaction (Kirkwood & Walton, 2010). Different research has been done trying to figure out several aspects of entrepreneurship and how some of them can lead to a successful company. (Begley, Tan 2001). Rural entrepreneurship is now seen as the strategic driver of rural development. Rural areas of the countries offer enough resources for the development of agro based entrepreneurship (Deepak Bhagat. (2014). Agricultural entrepreneurial aspects is often characterized with focus of identification and pursuit of opportunities which emphasizes the creative, alert, proactive, and networking aspects of entrepreneurial activity (DeTienne and Chandler 2004). However government might approach the development and implementation of youth employment strategies and programmes focusing on agro entrepreneurs (Valle, 2010). Moreover, the application of digital technology in agriculture has been instrumental but scope of it still remain unexploited (Seth, Ganguly, 2016). Digital Infrastructure such as Automation, agricultural robots, smart sensors and decision support systems to the farmers (Ganguly, Patra 2017).

Agri business is encountered with problems of jobs, employment, team building, and the willingness of people to create new jobs by starting up their own private agribusiness (Vojnović. Et.al, 2014). But still budding entrepreneurs needed to be encouraged by prospects of agribusiness and making them aware about fruitful government policies and start-up funding organisations (Blessil, Chandini, 2016). The scenario also demands the need for re-shaping of academic campuses keeping start-up entrepreneurship and youth in mind (Dwivedi 2017). Thus the literature review suggest various studies on motivating as well as resisting factors separately, to attract youth towards agro tech startups. The present study aims to collect all the criteria and will try to conclude the gap areas by a conceptual framework to be considered for all the related stakeholders of Agro tech sector.

III. OBJECTIVES

Profitable funding deals, incorporation status, supporting incubators continue to provide shape to agriculture but for sustainability and scalability youth with fresh innovative ideas are need of an hour. Thus main challenge for Agro tech startups is the talent retention of budding entrepreneurs who belong to the category of intelligent, educated and more knowledgeable about updated technology. Their entrepreneurial traits like risk taking, innovativeness, convincing power, networking skills, dealing with uncertainty and complexity also adds up as a motivating factors from being a Tech start up to Agro –tech Startup. With the demand for sustainability for coming future, this research paper tries to analyze the motivating as well as resisting factor from perspective of budding entrepreneur. Proposed study will be an attempt to bridge the gap between

motivating and resisting factor by addressing the issues with integrated framework of technology, start up and agriculture. For these youth wishing to become agro entrepreneurs can also take inspiration from successful startups. This research also tries to give suggestions to all stakeholders related to agro - tech startups ecosystem to cope the future challenges of landholding size, income returns, and utilization of seed money and use future technological adaptations like Artificial intelligence, robotics, marketing linkage models, big data analytics and Internet of things. The paper also discuss examples of few agro startups initiatives and development programs to increase the participation of budding entrepreneurs in the agriculture sector.

IV. METHODOLOGY

A structured questionnaire including 20 criteria for choosing as Agro Tech Startup are selected on the basis of literature review. The respondents were asked to choose the criteria as resisting or motivating factor. For primary data collection, the responses are received from 400 final year students (aged 18-25 years) of various UG and PG streams of 10 colleges in Jaipur city, Rajasthan. The colleges running both professional and degree courses are randomly selected. These colleges have an established Entrepreneurship cell or clubs from past 5 years with registered students having an entrepreneurship flair in them. These clubs provide platform to budding entrepreneurs which gives them number of innovative opportunities to develop the entrepreneur in them. Responses are collected through a structured questionnaire sent through either email, also in few cases collected from E – cell student coordinator of selected colleges. The questionnaire includes all the criteria which are held important as deciding factor for choosing or not choosing agro-tech startups over only tech startups as future business enterprise. On the basis of response, a conceptual framework is suggested to identify the feasible solution to the gap between the motivating and resisting factor.

The secondary data for understanding the current trends in agro tech startups, have been collected from various sources such as books, journals, periodicals, websites, blogs and research reports of previously conducted studies in this direction.

V. ANALYSIS

The main criteria chosen for study includes:

- Government initiatives for Startups- Government initiatives and schemes specially related to boost startups in the country is significant. But Government is not able to attract the budding entrepreneurs to have their startup in agriculture sector. As per the response collected, budding

entrepreneurs who have decided to set their own business in form of start up over job search, were aware about the flagship schemes of government like STARTUP INDIA, STANDUP INDIA but awareness level of Agriculture related startup schemes was too low. These schemes were seen as motivating factor by 76 % (refer Table 1) respondents and of the 24 % resisted response is due to lack of proper knowledge about availing the benefits in such schemes

- Future Growth Potential in Agriculture Sector-76 % (refer Table 1) respondents are motivated by the future growth potential of agriculture sector in India but it is considered still as one of the riskiest sector to invest in due to more dependence on uncontrollable factors.
- Improved Digitization in payment system in the rural areas has been a motivating factor for youth as it is helpful in bringing transparency in compensation system of all involved in agriculture value chain from farmers to intermediaries and final buyers.
- Smart phones is seen as a most cost effective means to overcome the challenges of agriculture sector. Role of internet is really being transformational for rural areas. Due to effective mobile phone penetration 82 % (refer table 1) of the respondents feel motivated to have a start ups related with agro tech mobile apps.
- Competitive environment for about 350 Agro Techstartups (Nasscom 2018) have started in Country in past 5 years which is very less as compare to number of urban startups in country. Perceiving less significant pressure of competitive environment, it was found as very motivating factor to opt for agro tech startups contrary to urban tech startups.
- Education system –Majority of Respondents (70%) (Refer Table 1) believed that having agriculture education based courses and training, drives an entrepreneur to have a related startup. Entrepreneur with different educational background resist to venture for agro based startups.
- The tendency of doing business related to agriculture is more with entrepreneurs having rural family background. Almost 72 % (refer Table 1) of the respondents believed that agro tech startups are more suitable to persons having rural family background as they are encouraged by family in terms of moral and financial support.
- Doing agriculture related business is perceived to be more of societal benefit rather than self-monetary benefit. Agro- tech startups are

perceived to be generating less remunerating income to the owners and more profitable for society at large.

- Startups for urban areas is most preferred by respondents as the risk of failure is less as compare to rural setups.
- Proper awareness for the agriculture value chain is a resisting factor. The respondents believed that had they are made fully aware about the value chain, it could be a motivating factor for setting a startup in agriculture.
- Technology is still perceived as a big task to incorporate in agriculture value chain by local network related to agriculture. The respondents perceived this as a resisting factor for limited support from agriculture related network which involves farmers, input companies, govt. agencies, food/agro companies, retailers and consumers.¹
- Agro tech is dominated by big players in terms of funding and investment, which is perceived as a resisting factors to enter for a small scale technology based startups in agro value chain.
- Team building for Agro Tech startups faces additional difficulty like dynamic forms of communication , frequent remote work, overloaded information to be captured in useful information .To convince and build the team for setting agro tech startups is perceived to be a resisting factor for budding entrepreneurs.
- Large gestation period between extensive job searches versus business, decreases the level of motivation, and moreover that too an agro business becomes a resisting factor.
- Respondents are ready to choose agro tech startups over a tech startups of urban area only when they are getting an expected remunerating income.
- Limited commercial guidance in this field is perceived as a resisting factor from startup to scale up agro tech startups.

Table 1: Motivating and resisting factor Percent criteria for Agro Tech Startups

Criteria for Motivating towards Agro Tech Startups	Motivating factors	Resisting Factors
Government initiatives for Startups	76%	24%
Future Growth Potential in Agriculture Sector	76%	25%
Digitization in Payment system	82%	18%
Smart phone	82%	18%

penetration		
Less competition for Agriculture startups	74%	26%
Suitable for Rural family background	80%	20%
Family support for Agro entrepreneurship	72%	28%
Degree in Agriculture Education	70%	30%
Training for setting Agro Tech startups	78%	22%
Societal benefit in form of Job creation	87%	13%
Insufficient knowledge about Agriculture Value chain	15%	86%
Limited support from Agriculture related network	26%	74%
Attraction towards urban startups	16%	84%
Fear of failure	22%	78%
Big players already holding Agro startups	14%	86%
Funding support for Agro- Tech Startups	34%	66%
Team building difficulty	16%	84%
Struggle from start up to scale up	13%	87%
Gestation period	27%	73%
Remunerating income	71%	29%

Source: Responses from Survey Questionnaire

5.1 Major Findings of the study

- Major proportion of respondents are inclined for urban tech startups only.
- Respondents considered agriculture as a family background as one of the motivating factor for setting an agro tech startups. Thus creating a constraints for entering in this area of business.
- Respondents are ready to choose agro tech startups over a tech startups of urban area only when they are getting an expected remunerating income.
- Monetary benefit to have a startup is preferred over societal benefit.
- Large gestation period between extensive job searches versus business, decreases the level of motivation.

- Lack of knowledge about agriculture value chain and practices,
- Innovative agriculture practices are rarely been projected in social media

Thus, budding entrepreneurs connect is low for Agro tech Startups.

5.2 Suggested Framework for motivating Budding Entrepreneurs in Agro tech startups

To involve and make use of entrepreneurial skills of the youth, the solution is to involve technology to solve agriculture related problem (Refer Figure 1). On the basis of feedback received from the survey, the urban tech startups can be provoked to involve in Agro tech startups.

Agro tech startups can provide IT led solutions like crop monitoring through big data technology, artificial intelligence, use of drones, weather prediction through remote monitoring and tracking.

Incorporating education and advisory services through technology can help farmers make informed decisions. Mobile apps can be made to suit their requirement according to multilingual content.

Moreover to create awareness among the budding entrepreneurs, social media can be used as an effective tool. Projection of startups who are already utilizing the agro space can be done through social media that can motivate the youth to explore opportunities of being an agro tech startups.

Startups have to find solutions to reduce the cost of input to farmers and reducing layer of intermediaries, this can be done by incorporating technology in innovative way with new forms of partnership like connecting farmers directly with fertilizers, pesticides and seed companies, retailers, and consumers.

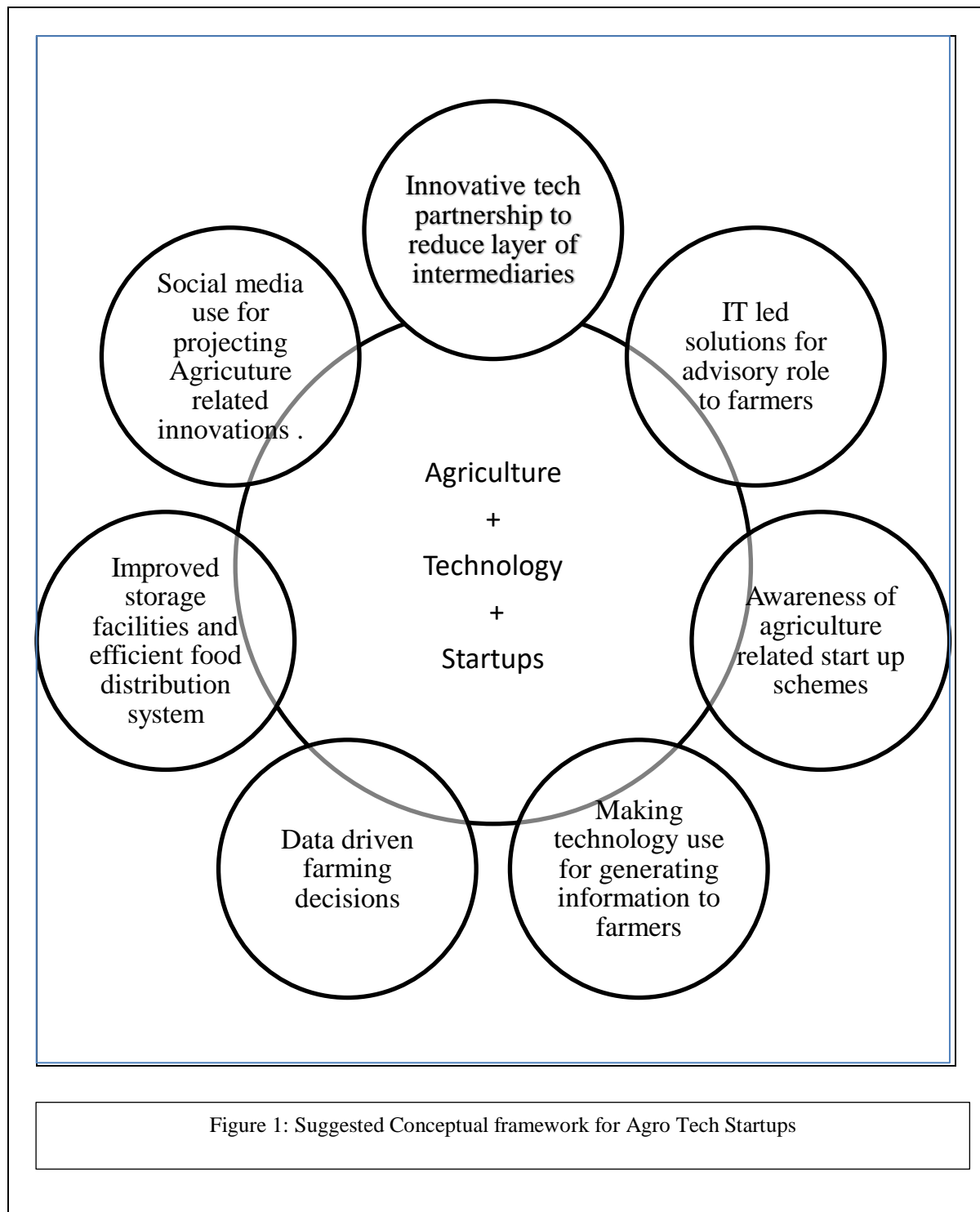
Agro tech startups can be a solution to food storage and distribution systems by connecting third party logistics and transforming warehousing inventory system. Big Data technology can be effective for farmers to make decisions on the basis of soil and crop health, also helpful in determining risks. Although, Government is involved in an exceptional role by introducing various schemes to boost technology and involve youth to solve agriculture sector problems, but the awareness level is not reached up to the mark. Framework suggests to make budding entrepreneurs aware about the remunerating potential of agriculture sector .Thus combining the Startup zeal with technology and offering it to Agriculture sector is the most sustainable solution for agriculture sector problem in country.

VI. CONCLUSION

Budding entrepreneurs have the potential to transform the agriculture practices in India .They have the capability of modify business-models and moving up the value chain of agriculture. This will not only help Indian Start Ups to merge advanced technological innovation but also help farmers towards improved living conditions. Government schemes and policies also boost the agriculture sector attractiveness for youth , by providing required funding and incubation support .Increasing the awareness level,

investing in sustainable agriculture practices by efficient technology can increase the participation of budding entrepreneurs in agriculture sector. The suggested framework suggest the formula of sustainable solution between three yardsticks namely Technology, agriculture and Entrepreneurship.

formalizing entrepreneurial skills in education sector and



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