

International Conference on

***Multidisciplinary Research in Global Challenges and
Perspectives of Sustainable Development***

on 21th December 2019 at St. Jerome's College, Anandhanadarkudy,
Nagercoil, Tamilnadu, India

Scenario of Indian Startups with Special Reference To Agritech Startups

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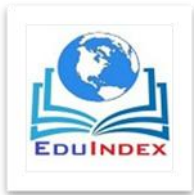
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Abstract

Agriculture has always been called the backbone of Indian economy, supporting the livelihoods of the majority of the population. India has the 10th-largest arable land resources in the world. Startup India is a Government of India flagship initiative to build Startups and nurture innovation. Through this initiative, the Government plans to empower Startup ventures to boost entrepreneurship, economic growth and employment across India. Indian agritech startups have received 300 per cent more funding in the first six months of 2019 than the total funding received in 2018. This paper projects the Indicators of Indian Startups in the Global Scenario, Startups in India both Technology based Startups and Non Technology based Startups, Growth of Startups in India and Number of Agritech Startups. The researcher used percentage analysis, correlation analysis, trend analysis and exponential growth rate. From the analysis, it is inferred that India needs to be improved in technology, reduce the formalities in starting the business so that the number of days can be reduced and should spend more money on research and development. As Non Technology based Startups outnumbered Technology based Startups, there arise an urgent need to take a concrete step to move Non Technology based Startups to Technology based Startups. The correlation analysis for the Growth of Startups in India shows that though the derived values are positive the degree of relationship is moderate and hence it is suggested to improve both the number of startups and the startup funding in India. The correlation between the number of total Startups and Agritech Startups is high and positive to the tune of 0.95. Hence it is observed there is wider scope for Agritech Startups in India.



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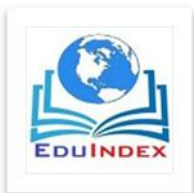
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Key Words: Agritech, Correlation, Indicators, Non Technology, Startups, Technology, Trend

Indian Agriculture Scenario

Agriculture has always been called the backbone of Indian economy, supporting the livelihoods of the majority of the population. Although India has a significant presence internationally in terms of production of key cereals, pulses, fruits, vegetables and animal products, at the same time, productivity is fairly low. Despite a conducive policy environment and strong demand pull for the sector, key challenges plaguing the sector involve smaller holding size, dismal primary and secondary processing infrastructure, a convoluted supply chain with multiple levels and intermediaries, and limited last mile delivery of services, to name a few. India has the 10th-largest arable land resources in the world. With 20 agri-climatic regions, all 15 major climates in the world exist in India. The country also possesses 46 of the 60 soil types in the world. India is the largest producer of spices, pulses, milk, tea, cashew and jute; and the second largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds. Further, India is second in global production of fruits and vegetables and is the largest producer of mango and banana. During 2017-18 crop year, food grain production is estimated at record 284.83 million tonnes. In 2018-19, Government of India is targeting food grain production of 285.2 million tonnes. Production of horticulture crops is estimated at 314.86 million tonnes (mt) in 2019 as per third advance estimates. India is among the 15 leading exporters of agricultural products in the world. Agricultural exports from India reached Rs 2,67,049.69 crores (US\$ 38.21 billion) in FY18 and Rs 20,687.44 crore (US\$ 2.96 billion) as of April'19. Exports of ready to eat items from India reached Rs 4,821.71 crore (US\$ 689.80 million) in FY18 and have reached Rs 4,766.14 crore (US\$ 681.95 million) in FY19. The Agriculture Export Policy, 2018 was approved by Government of India in December 2018. The new policy aims to increase India's



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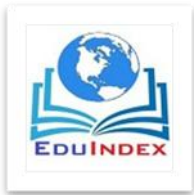
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agricultural exports to Rs 4,19,340 crores (US\$ 60 billion) by 2022. India was the ninth largest exporter of agricultural products in 2017.

The Electronic National Agriculture Market (eNAM) was launched in April 2016 to create a unified national market for agricultural commodities by networking existing Agriculture Produce Marketing Committees (APMCs). Up to May 2018, 9.87 million farmers, 109,725 traders were registered on the e- NAM platform. 585 mandis in India have been linked while 415 additional mandis will be linked in 2018- 19 and 2019-20. Cumulative trade on the platform reached Rs 41,855 crore (US\$ 6.49 billion) by March 2018. The Budget 2019 has identified Agriculture Sector as one of the key drivers of the economy. Under the budget Agricultural Marketing Infrastructure (AMI) scheme 40 lakh MT of storage capacity & 400 other marketing Infrastructure projects are targeted by 2019-20.

The Government of India has introduced several projects to assist the agriculture sector. They are Pradhan Mantri Gram Sinchai Yojana: The scheme aims to irrigate the field of every farmer and improving water use efficiency to achieve the motto 'Per Drop More Crop'. Overall the scheme ensures improved access to irrigation. Around 285 new irrigation projects will be undertaken in 2018 to provide irrigation for 18.8 million hectares of land. As per Union Budget 2019-20 the scheme has been allocated Rs 3,949.90 crore (US\$ 565.16 million). As per the Ministry of Agriculture, during 2019-20, Rs 1.50 crore (US\$ 0.13 million) has been allocated to state of Andaman and Nicobar as a central share for implementation of per drop more crop component of Pradhan Mantri Krishi Sinchai Yojana (PMKSY). Paramparagat Krishi Vikas Yojana (PKVY): The scheme aims to motivate groups of farmers to take up organic farming and as per the revised estimate for 2018-19, government had allocated Rs 77,752 crore (US\$ 11.12 billion).



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Startups in India

Startup India is a Government of India flagship initiative to build Startups and nurture innovation. Through this initiative, the Government plans to empower Startup ventures to boost entrepreneurship, economic growth and employment across India. The Government's Action Plan will help accelerate the growth of Startups throughout India, across all important sectors – in Tier 1, 2 and 3 cities, including semi-urban and rural areas and includes promoting entrepreneurship among SCs/STs and women communities. Startup India is about creating prosperity in India. Many enterprising people who dream of starting their own business lack the resources to do so. As a result, their ideas, talent and capabilities remain untapped and the country loses out on wealth creation, economic growth and employment. *Startup India* will help boost entrepreneurship and economic development by ensuring that people who have the potential to innovate and start their own business are encouraged with proactive support and incentives at multiple levels. Startup India campaign has received worldwide support for its attempt to bring Startups to the forefront of India's growth story.

Global standing Source:

- India is the largest producer of spices, pulses, milk, tea, cashew and jute; and the second largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds.
- India is currently the world's fourth largest producer of agrochemicals.
- India has the largest livestock population of around 512 million.

Favorable conditions



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- India has the 10th largest arable land resources in the world. With 20 agri-climatic regions, all 15 major climates in the world exist in India. The country also possesses 46 of the 60 soil types in the world. Growth in Gross Value Added (GVA) by agriculture and allied sectors grew at 2 per cent in Q1 2019-20.
- Strategic geographic location and proximity to food importing nations favour India in terms of exporting processed foods

Increasing farm mechanisation

- India is one of the largest manufacturers of farm equipment such as tractors, harvesters and tillers. India accounts for nearly one-third of the overall tractor production, globally.
- Tractor sales in the country are expected to increase 11-13 per cent in FY19, while the tractor industry is expected grow at 8-10 per cent between FY17-22.

Rising consumption expenditure

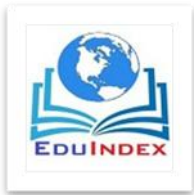
- Consumer spending in India is likely to reach US\$ 3.6 trillion by 2020.
- Private final consumption expenditure (at constant prices) increased by 6.1 per cent in 2017-18 and 8.6 per cent in April-June quarter of 2018-19.

Record production of food grains

- During 2017-18 crop year, food grain production is estimated at record 285.01 million tonnes. In 2018-19, Government of India is targeting food grain production of 283.37 million tonnes.

Table 1 Indicators of Indian Startups in the Global Scenario

Indicators	India	China	Israel	Singapore	Japan	US
Total no of startups (approx)	10,000	10,000	4,750	NA	NA	83,000
Tech based startups	4,300	3,400	4,000	NA	NA	48,500
%	43	34	84	NA	NA	58



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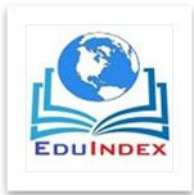
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Non - Tech based startups	5,700	6,600	750	NA	NA	34,500
%	57	66	16	NA	NA	42
Set up a new business (days)	30-60	30	13	2	10	4
Rank	VI	V	IV	I	III	II
Corporate tax rate (%)	34	25	26	17 tax free for startups)	34	39
No of tax payments by business (p.a)	33	9	TBD	TBD	TBD	11
Bank lending rate (%)	10.3	5.6	3.9	5.4	1.2	3.3
Rank	VI	V	III	IV	I	II
R&D spending % of GDP	0.85	1.90	4.20	NA	3.40	2.80
Rank	V	IV	I		II	III

Source: World Bank, New articles, Government Sites

India is amongst the top five countries in the world in terms of startups. US ranks number one on the list with 83,000+ startups. India and China go together occupying second position with 10,000 startups and then Israel with 4750 startups. Technologically, Israel is placed as first with 84 percent, US is placed second (58%), India is placed third (43%) and China is placed fourth (34%). With regards to the number of days taken to start a new business is least in Singapore just 2 days, US took 4 days, Japan 10 days, Israel 13 days, China 30 days and in India it took 30 to 60 days. Corporate tax rate is more in US (39%) and is low in China (25%). In case of number of tax payments by business, India holds high and China lags behind. The Bank lending rate is high in India and is low in Japan. Israel spends a lot for research and development and India spends least for the same. So it is inferred that India needs to be improved in technology, reduce the formalities in starting the business so that the number of days can be reduced and should spend more money on research and development.

Table 2 Startups in India



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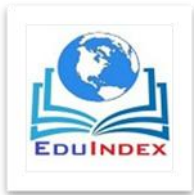
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Technology based Startups	%	Non Technology based Startups	%
4300	43	5700	57
E-Commerce	34	Engineering	17
B2B	24	Construction	13
Consumer Internet	12	Agri Products	11
Mobile apps	10	Textile	8
Software as a service (SaaS)	8	Printing & Packaging	8
Others	12	Transport & logistics	6
		Outsourcing & support	5
		Others	32

Source: Agritech in India, NASSCOM, June 2018

The entire Startups in India have been sub divided as Technology based Startups constituting 43 percent and Non Technology based Startups constituting 57 percent. Within Technology based Startups, E-Commerce (34%), B2B (24%), Consumer Internet (12%), Mobile apps (10%), SaaS (8%) and other categories (8%). As far as the Non Technology based Startups are concerned, Engineering (17%), Construction (13%), Agri Products (11%), Textile (8%), Printing & Packaging (8%), Transport & logistics (6%), Outsourcing & support (5%) and other categories (32%). As Non Technology based Startups outnumbered Technology based Startups, there arise an urgent need to take a concrete step to move Non Technology based Startups to Technology based Startups. The following pictures further illustrate the same.

Chart a



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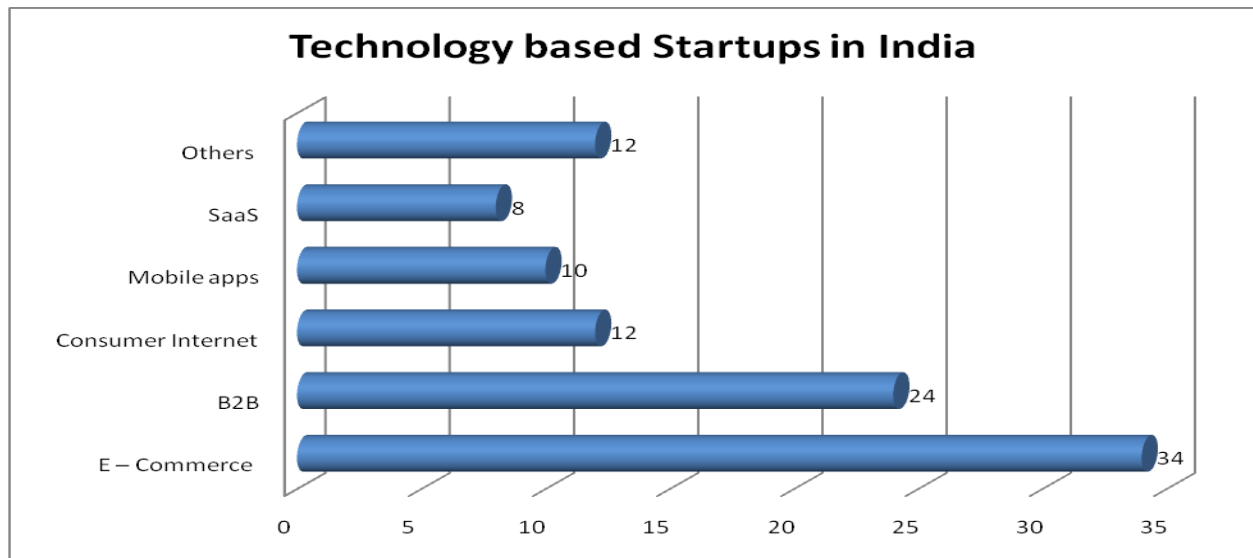
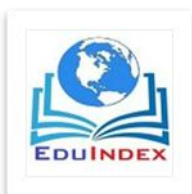


Chart b



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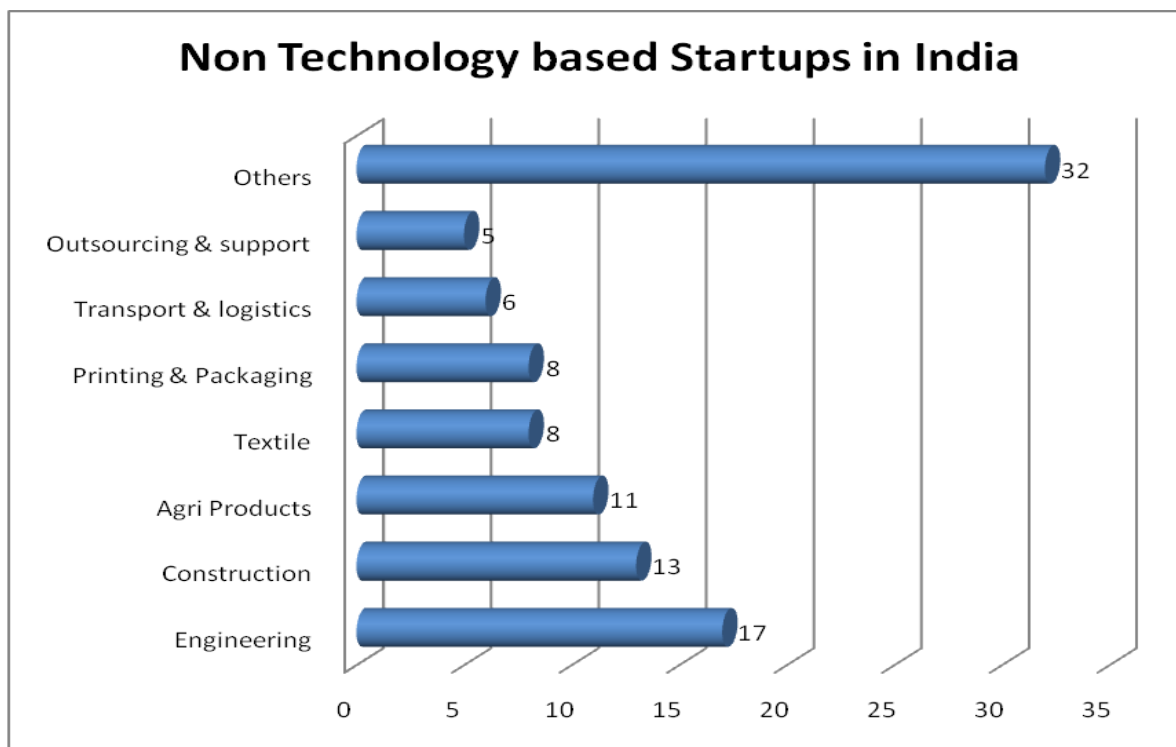
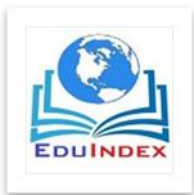


Table 3 Growth of Startups in India

Year	No of Companies	Trend %	Funding Amount (USD)	Trend %
2007	33	100	39.7	100
2008	41	124	8.4	21
2009	58	176	9.4	24
2010	63	191	151.5	382
2011	63	191	301	758
2012	76	230	1069	2693



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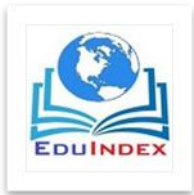
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2013	87	264	86.6	218
2014	117	355	148.6	374
2015	193	585	129	325
2016	171	518	2736.1	6892
2017	32	97	176.8	445
Average	85	257	441.46	1112
r	0.59		0.43	
	0.50			

Source: Agritech in India, NASSCOM, June 2018

The growing trend of Startups in India is described in the above table. It states that there is an increase of startups till 2015 and then it started declining. The average growth rate is estimated as 157 percent and is high in the year 2015 to the tune of 485 percent by taking 2007 as base year. The average funding amount towards is 441.46 USD and the same is high in the year 2016 (2736.1 USD). The trend is calculated by assuming 2007 as the base year. The result shows that the average growth rate is 1012 percent and the highest growth in funding happened in the year 2016 to the extent of 6792 percent. It is inferred from the analysis that more funding sources and channels should be explored to improve the startups in India. The correlation for the number of startups is 0.59, for startup funding the correlation is 0.43 and the correlation between the number of startups and startup funding is 0.50. The correlation analysis shows that though the derived values are positive the degree of relationship is moderate and hence it is suggested to improve both the number of startups and the startup funding in India.

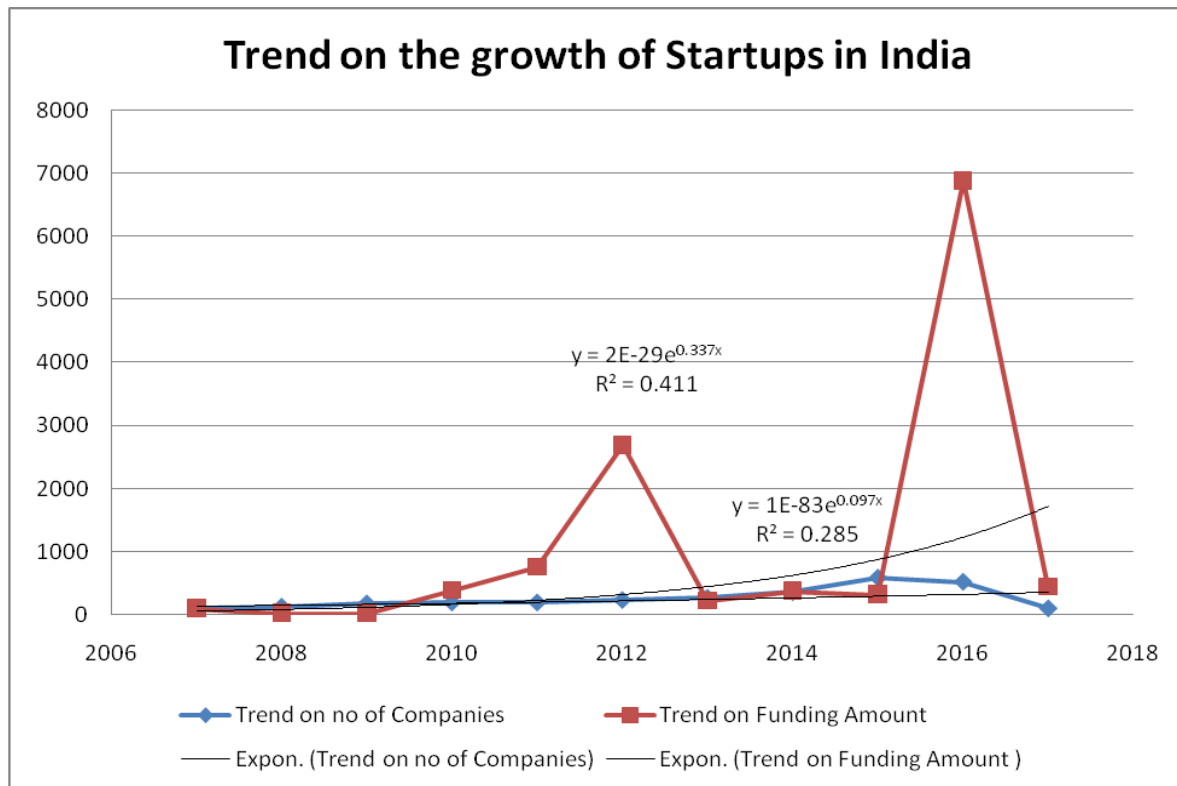
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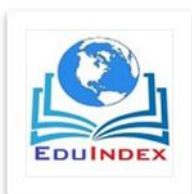
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Agritech Startups

A wave of agritech startups in India has come in up last few years to address the problems of Indian agriculture such as supply chain management, use of outdated equipment, improper infrastructure, and farmers unable to access a wider range of markets with ease and enhancing the sector's marketing infrastructure has been developed in India which tackles this issue and has the potential to change the face of Indian agriculture sector and eventually raise farmers' incomes. Indian agritech startups have received 300 per cent more funding in the first six months of 2019 than the total funding received in 2018. Agritech companies raised \$ 248



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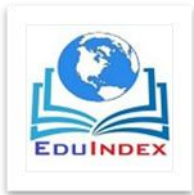
million until June 2019, which was only \$ 73 million in 2018, according to NASSCOM. “Farmers and agritech startups in India have evolved rapidly over the past few years due to digital penetration and funding, majorly driving the growth in this sector,” says the report. New areas in the agritech sector such as market linkage, digital agriculture, better access to inputs, farming as a service (FaaS) and financing are attracting more and more stakeholders to connect with this new trend in agriculture. Indian agritech companies are also focussing on South East Asia, Europe, Africa and South America. NinjaCart remained the top-funded Indian startup with funding of \$ 89 mn received in 2019. Samunnati Financial Intermediation, AgroStar, WayCool and Jumbotail remained the other startups with the highest funding till June. Tiger, Accel, BII, omnivore and Nuveen remained the top 5 investors till June 2019.

Table 4 Number of Agritech Startups

Year	No of total Startups	Trend %	No of Agritech Startups	Trend %	Proportion of Agritech	Trend %
2013	87	100	43	100	49	100
2014	117	134	59	137	50	102
2015	193	222	117	272	61	123
2016	171	197	109	253	64	129
2017	32	37	38	88	119	240
Average	120	138	73	170	69	139
r	-0.14		0.17		0.84	
	0.95					

Source: Agritech in India, maxing India farm output, June 2018, NASSCOM and PwC analysis

The above table shows the number of Startups and the Proportion of Agritech startups in the total Startups. A total of 366 agri-based startups have come up from 2013 to 2017. The



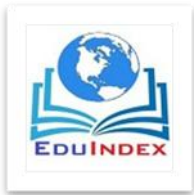
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perusal of data presented in the Figure revealed that the year 2015 saw the maximum number of startups (117) getting started. It was followed by 2016 which also presented a good number of startups (109) getting started to answer the concerns associated with Indian agriculture. It is to be noted that more than 50 percent of the startups in the last 5 years got started in year 2015 and 2016. The trend on the number of Startups is growing upwardly till 2016, the same is high in the year 2015 (122%) with an average growth rate of 38 percent by taking 2013 as the base year. The trend on the number of Agritech Startups is also growing upwardly till 2016, the same is high in the year 2015 (172%) with an average growth rate of 70 percent by taking 2013 as the base year. The average proportion of Agritech Startups to total Startups is 69 percent with the steady growth which has its peak in the year 2017 to the extent of 140 percent. The correlation is negative in case of number of Startups (-0.14), positive and low for the number of Agritech Startups while is positive and high in case of the proportion of Agritech Startups to total Startups is 0.84. The correlation between the number of total Startups and Agritech Startups is high and positive to the tune of 0.95. Hence it is observed that there is wider scope for Agritech Startups in India. It is further explained in the following chart.

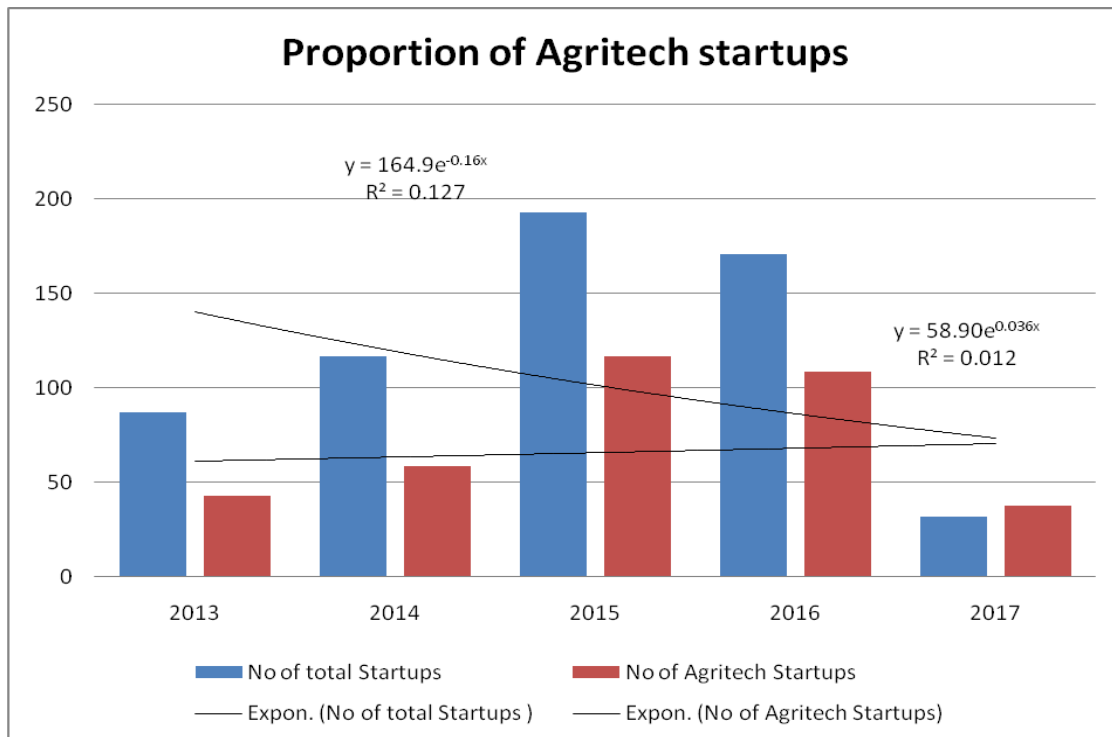
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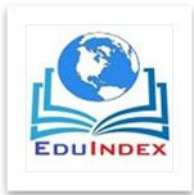
Challenges faced by the agri start-up ecosystem

Low landholding size: Small and scattered landholdings of farmers reduce the scope of technology scale up, leading to poor cost effectiveness.

Return for the investors: Rate of return on technology investment has not proven very profitable in case of agri tech startups as compared to other IT-based startups.

Talent retention: Agri start-ups and enterprises are finding it hard to retain technical talent working in this sector.

Long gestation period: Technology adoption and penetration is a very slow process which certainly diminishes investors' interest.



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Technology affordability: High-priced technology solutions are unaffordable for a large user group, i.e. small and marginal farmers.

Skill adaptability: Making farmers adaptive to the required skills for working on advanced technologies requires significant effort.

Non- localised technologies: Most of the technology solutions available are not localised to emerging markets.

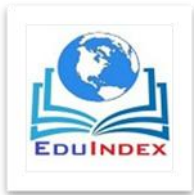
Regulatory and policy issues:

- Regulations are favourable, but are complex in nature.
- Facilitating adoption of proven technologies through subsidy is yet to gain momentum.

Deployment constraints: Equipment with proven technologies is largely deployed by service providers due to poor last mile reach of start-ups.

CONCLUSION

As one of the most important cornerstones of the Indian economy, development of the agriculture sector is a key focus area. There is a gradual shift in Indian agriculture towards technology, information and knowledge management systems for farming systems, integrated value chains and favourable policymaking. In order to make agri start-ups successful, it is crucial to enable seamless hybridisation of relevant technology by building a promising 'new-age distribution model'. We need to develop a new way for the farmer to buy products and get information as well as credit on one unified platform. Merely providing content on an app is not going to solve the issues of the farming community. Technology is just one component; an evolved distribution system with a human touch is what will make the model scalable over time. Agriculture infrastructure also needs to be modernised and improved, considering the requirements. The present study focused on the Indian scenario of startups in the global scenario, growing trend of startups along with technology based startups



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and non technology based startups and the proportion of agri startups to total startups. The observation made from the study shows that as Non Technology based Startups outnumbered Technology based Startups, there arise an urgent need to take a concrete step to move Non Technology based Startups to Technology based Startups. The correlation analysis shows that though the derived values are positive the degree of relationship is moderate and hence it is suggested to improve both the number of startups and the startup funding in India. There is wider scope for Agritech Startups in India. The average proportion of Agritech Startups to total Startups is 69 percent with the steady growth which has its peak in the year 2017 to the extent of 140 percent. The correlation analysis shows that though the derived values are positive the degree of relationship is moderate and hence it is suggested to improve both the number of startups and the startup funding in India.

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