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### Agristartup environment of entrepreneurs on artificial intelligence

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#### Abstract

The study conducted to understand the agristartup environment on artificial intelligence perceived by agristartup entrepreneurs in ten agristarups of telangana with a sample size of 30 in the year 2021. Agristartup environment index was developed for the study by selecting seven indicators. It was found that (56.7%) of the agristartup entrepreneurs perceived the agristartup environment as favourable. Institutional support was found to be negative and significant with the agristartup environment perceived by the agristartup entrepreneurs. Education, family background, innovative proneness, business sustainability, service orientation, financial management was found to be positive and significant with the agristartup environment perceived by the agristartup entrepreneurs. Age of the agristartup entrepreneurs was found to be non significant. Agristartup environment in artificial intelligence can be improved by institutional support through incubators.

**Keywords:** Agristartup environment, entrepreneurs, artificial intelligence

#### Introduction

Agricultural startups across the country were spread unevenly along with the funding with total of 50% of agritech startups were working in Karnataka and maharastra states and also Karnataka caught 67% of the total funding. Agri-startups with novel technologies such as Artificial Intelligence (AI), Machine Learning (ML) and data analytics are significantly efficient in farming. The support from family at extension level and government and other organizational at policy level can reinforce their capacities besides helpful to family and national income (Nain *et al*, 2013) [8]. The entrepreneurial attributes like innovativeness have contributed significantly to the prediction of the creation of favorable entrepreneurial climate. The incubators have a significant distress in securing funding to feed the nurturing process (Kumar *et al*, 2022) [5]. Multiple challenges including inadequate infrastructure, absence of quality appraisals, inadequate technical support, and a dearth of knowledge sources hinders the utilization of the agristarups on artificial intelligence (FICCI, 2020) [2]. Incubation support helps the growth of their business at various stages of agristarups which enhances the field knowledge given in the agristartup establishment. Hence the duration of training need to be increased (Ashu Chauhan, 2023) [1]. The stable macro economic environment had a positive impact on the development of the entrepreneurial

movement, the Startup movement received strong support from the Government, ministries and social organizations whereas the lack of good start-up education system, start-up's weakness, lack of financial assistance and government support has negative impact (Vuvanhung *et al*, 2018) [17]. The six components of entrepreneurial environment, economic, education, infrastructure, and public support were found middle neither strong nor poor while other three political, social and cultural, legal and administrative were poor. This poor entrepreneurial environment is partially due to misguidance of government policies (Yagoub and Timan, 2013) [19]. In this digital agriculture revolution, focus on agristartups on artificial intelligence is more prevalent and many youth are looking forward in investing on the agristartups on artificial intelligence. Government of Telangana is prioritizing agriculture sector through several initiatives on agristartups on artificial intelligence by collaborating with the Wadhwani AI and PJTSAU (Aghub initiatives) etc, with the objective to achieve digital transformation across the value chain with all the stakeholders in a harmony manner to realize benefits for the farmers using artificial intelligence technologies. Thus the present investigation was conducted to the study the perceived favourability of agristartup environment on artificial intelligence by agristartup entrepreneurs with the help of the Agristartup environment index (AEI).

## Methodology

An *expost-facto* research design was adopted for the study conducted in the year 2020-2021. 10 agristartups were selected purposively from the agristartups on artificial intelligence based on drone based, precision management and agro advisory namely Thanos technologies, Bharatrohan, Plantix, Marut drones, Senseacre LLBs, Aries solutions, Soil sens, Fasal, Agrirain, Kheyti. From each agristartup 3 agristartup entrepreneurs were selected by following random sampling procedure. The sample constituted to a total of 30 agristartup entrepreneurs. Total of ten profile characteristics i.e., age, education family background, innovative Proneness, business support, business sustainability, social networking, service orientation, institutional support and financial management were taken to find out the relationship with the agristartup environment as perceived by agristartup entrepreneurs. Index was developed for the agristartup environment based on the review of literature and discussion with experts, a list of 10 indicators were identified and shortlisted after the ratings of judges indicators having relevancy score 0.80 and above. The seven indicators were selected to study the agristartup environment i.e., global environment, political and legal environment, socio-cultural environment, economic and technological environment, infrastructural environment, institutional environment and micro environment. The reliability was measured by using test- retest method and correlation value ( $r=0.83$ ) found satisfied. The content validity method used to know the validity of the index. As the index differs for most of the statements included had a very discriminating value, it seemed reasonable to accept the index as a valid measure of the agristartup environment. Each indicator to study the agristartup environment consisted unequal number of statements and hence their range of scores was different. Therefore, the scores of all the seven indicators by agristartup entrepreneurs were normalized separately by using the formula.

Where,

$$U_{ij} = \frac{Y_{ij} - \text{Min}_{yj}}{\text{Max}_{yj} - \text{Min}_{yj}}$$

$U_{ij}$  = Unit score of the  $i^{\text{th}}$  respondents on  $j^{\text{th}}$  component

$Y_{ij}$  = Value of  $i^{\text{th}}$  respondent on the  $j^{\text{th}}$  component

$\text{Max}_{yj}$  = Maximum score on the  $j^{\text{th}}$  component

$\text{Min}_{yj}$  = Minimum score on the  $j^{\text{th}}$  component

The score of each component ranged from 0 to 1 i.e. when  $Y_{ij}$  is minimum the score is 0 and when  $Y_{ij}$  is maximum the score is 1.

$$\text{Agristartup environment of entrepreneurs} = \frac{SI_1 + SI_2 + SI_3 + SI_4 + SI_5 + SI_6 + SI_7}{7}$$

Where

SI 1 = Normalized indicator value of global environment

SI 2 = Normalized indicator value of political and legal environment

SI 3 = Normalized indicator value of socio-cultural environment

SI 4 = Normalized indicator value of economic and technological environment

SI 5 = Normalized indicator value of infrastructural environment

SI 6 = Normalized indicator value of institutional environment

SI 7 = Normalized indicator value of micro environment

The obtained index value ranged from 0 to 1. Based on these index values the respondents were classified into a different level of perceived favourableness i.e. very less favourable, less favourable, favourable, highly favourable and very highly favourable based on the range value obtained. The highest score among agristartup entrepreneurs and farmers was the highest 0.98 and the lowest was 0.19 and the highest 0.69 and the lowest 0.15 respectively. The respondents were classified into five categories based on inclusive class.

## Results and Discussion

**Table 1:** Distribution of respondents on dimension of Agristartup Environment Index (AEI)

S. No	Indicator	Category	Class interval	Percentage
1.	Global environment	Less favourable	18-22	33.30
		favourable	23-27	60.00
		Highly favourable	28-32	6.70
2.	Political and legal environment	Less favourable	18-24	6.70
		favourable	25-31	30.00
		Highly favourable	32-38	63.30
3.	Sociocultural environment	Less favourable	24-28	46.70
		favourable	29-33	43.30
		Highly favourable	34-38	10.00
4.	Economic and technological	Less favourable	18-25	6.70
		favourable	26-33	50.00
		Highly favourable	34-38	43.30
5.	Infrastructural environment	Less favourable	15-18	13.30
		favourable	19-22	46.70
		Highly favourable	23-26	40.00
6.	Institutional environment	Less favourable	9-13	30.00
		favourable	14-18	26.70
		Highly favourable	19-23	43.30
7.	Micro environment	Less favourable	11-14	20.00
		favourable	15-18	56.70
		Highly favourable	19-22	43.30

Data presented in table.2 shows that majority (56.70%) of the agristartups entrepreneurs perceived agristartup environment on agristartups artificial intelligence favourable followed by less favourable (26.70%) and highly favourable (16.70%). It could be inferred that 73 per cent of the agristartup entrepreneurs perceived that agristartup environment of agristartups on artificial intelligence is favourable and above. The probable reason might be

increasing focus of agristartup culture on artificial intelligence from the incubators and also emerging initiatives from the government. It is also depicted from the table that 26 percent of the agristartup entrepreneurs perceived that agristartup environment of agristartups on artificial intelligence is less favourable this may be due to lack of family support and accessibility of the investors.

**Table 2:** Favourableness of Agristartup environment on Artificial intelligence

S. No	Category	Class interval	Frequency	Percentage
1.	Less favourable	0.19-0.44	08	26.70
2.	Favourable	0.45-0.70	17	56.70
3.	Highly favourable	0.71-0.96	05	16.70
Total			30	100

### Relationship between Profile characteristics of agristartup entrepreneurs and agristartup environment as perceived by agristartup entrepreneurs

It is revealed from the Table.3 that calculated 'r' values between education, family background, innovative proneness, business sustainability, service orientation, financial management were greater than table 'r' value at 0.01 level of significance. Whereas, the calculated 'r' value of the variables social networking was greater than 'r' value at 0.05 level of significance. In case of institutional support negatively significant correlation was observed with and agristartup environment as perceived by famers, the

calculated 'r' value is greater than the table value at 0.01 level of significance. Hence, null hypothesis was rejected, and empirical hypothesis was accepted. Therefore, it can be concluded that there is a positive and significant difference between agristartup environment on artificial intelligence as perceived by agristartup entrepreneurs and the independent variables like education, family background, innovative proneness, business sustainability, service orientation, financial management. On other hand calculated 'r' values between age and agristartup environment as perceived by agristartup entrepreneurs were less than the 'r' table value.

**Table 3:** Relationship between Profile characteristics of agristartup entrepreneurs and agristartup environment as perceived by agristartup entrepreneurs

S. No	Profile characteristics of agristartup entrepreneurs	Correlation coefficient(r)
1.	Age	0.258
2.	Education	0.552**
3.	Family background	0.452**
4.	Innovative Proneness	0.485**
5.	Business support	0.548**
6.	Business sustainability	0.440**
7.	Social networking	0.338*
8.	Service orientation	0.524**
9.	Institutional support	-0.567**
10.	Financial management	0.451**

\*\*Significant at 0.01 level, \*Significant at 0.05 level, NS= non-significant

It was observed from the results that there was a non-significant relationship between variable age and agristartup environment as perceived by agristartup entrepreneurs. The possible reason for above trend might be attributed to the fact that the young agristartup entrepreneurs has more innovative and risk taking compared to old agristartup entrepreneurs. The variables education and family background were found to be positive and significant. The possible reason might be higher education with rural background creates interests and enthusiasm as the agristartup entrepreneurs know the lacunae in agriculture sector which effect the agristartup environment. The variable innovative proneness was found to be positive and significant, may be due to the fact that as the agristartups on artificial intelligence are updating their features according to the needs of the farmers it influences the agristartup environment. Business support was found be positive and significant, due to more support from the family and peers

in the agristartups of artificial intelligence. Business sustainability was found positive and significant, which indicates that the managing the agristartups in long term by sustaining with the competitors creates favourable agristartup environment. Social networking and service orientation was observed positive and significant relation, this might due to that the fact more networks with institutions and fellow agristartups helps the agristartups entrepreneurs creating more knowledge in the field and in directing helps to reach the farmers by providing quality services which effects the agristartup environment. Institutional support was found to be negative and significant. This might be due to the fact that there is young agristartup entrepreneurs are unable to access the support from institutions due to less social networking and old age are able to access as they have more networking. Financial management was found to be positive and significant. This might due to the fact that maintaining financial records and

analysis time to time is helping the agristartup entrepreneurs is influencing the agristartup environment.

### Conclusion

Agristartups entrepreneurs perceived the global environment as favourable and also focus on more regulatory policies need to be improvised so that the global investment deals in india would be increased which would encouragement for future young agristartups entrepreneurs in artificial intelligence. The political and legal environment would gain more prominence if the registration procedures for agristartups on artificial intelligence should made easy within less time. The sociocultural environment that the favourable policies focusing on the agristartups as well as farmers to improve their usage of services needed to be framed. The economic and technological environment create importance in providing the incubators support in attaching of the investors. The infrastructural environment would be helpful if the proper execution of research development facilities from the incubators from which the agristartup is incubated. The institutional environment needed for the proper research and incubational support to reach the unreached farmers. The microenvironment helps the agristartup entrepreneurs in choosing the extension agent or the progressive farmers to gain the promotional support.

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