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Artificial intelligence related agristartup environment of farmers

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Abstract

The present investigation was carried out to assess the agristartup environment related to farmers. Sample was selected randomly based on farmers who are using the services constantly three years from selected agristartup with a sample size of 90 in the year 2021. Agristartup environment index was developed for the study by selecting four indicators. It was found that (46.7%) of the farmers perceived the agristartup environment as favourable. Social participation is negative and non-significant with the agristartup environment perceived by the farmerrs. The variables such as age, digital literacy, farming experience, social networking and innovativeness, extension contact, information seeking behaviour had positive and significant relationship with agristartup environment. Age, farm size and fam equipment possession of the farmers is non-significant. Agristartup environment is refined by involving the farmers in several tasks conducted by agristartups.

Keywords: Agristartup environment, farmers, artificial intelligence

Introduction

In India agristartups are rapidly booming, with sustainable growth in investments and increasing government intiatives (Kumar *et al*., 2024) [4]. The encouragement from family at scalable level and government and other organizational at policy level can strengthen their capacities and also startup network (Nain *et al*, 2013) [6]. India has 83 unicorn startups with a combined valuation of over 280 billion dollars most of these under service sector which contribute to half of the Indian GDP (Patwardhan, 2022) [5]. Agristart-ups helps in collaborating between the farmers, institutions, wholesalers, retailers, and consumers (Adhya and Sahoo, 2022) [1]. Agristartups also helps in linking among farmers, researchers, and investors, leading to create more agristartup ecosystem. The major challenges for agristartup for farmers is technological skills to handle them. (Aparna etal, 2022) [2]. In this artificial intelligence revolution, priority for agristartups is essential and many youths amidst from nonagriculture background are coming forward in investing on the agristartups. Agristartup environment of farmers is also crucial to make the entire agristartups successful. Thus the present study was done to estimate the agristartup environment of farmers with the help of the Agristartup environment index (AEI).

Methodology

Tthe individuals from the farming community who actually subscribed to the agristartups on artificial intelligence and receiving the services from them were selected purposively. Ninety farmers i.e., 30 farmers from each of the three startups (Thanos, Plantix, Bharat rohan) were selected. The farmers from each agristartup were taken based on the services received by them 3 successive years from the agristartups randomly. The selected sample for the investigation contains ninety farmers. Profile characteristics selected for the study are age, digital literacy, farm size, farming experience, social participation, extension contact, social networking, farm equipment possession, innovativeness, information seeking behavior for correlating with agristartup environment. Index was designed for the agristartup environment based on the literature and suggestions from the experts, a list of four indicators were finalized based on relevancy score 0.80 and above. The four indicators were selected were listed below. The reliability and validity were authenticated accordingly. The scores of all the four indicators of farmers were normalized separately by using the formula.

$$U_{ij}=\frac{Y_{ij}-Min_{yj}}{Max_{yj}-Min_{yj}}$$

Where, U_{ij} = Unit score of the i^{th} respondents on j^{th} component ; Y_{ij} = Value of i^{th} respondent on the j^{th} component ; Max_{yj} = Maximum score on the j^{th} component; Min_{yj} = Minimum score on the j^{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.

$$\text{Agristartup environment of farmers} = \frac{SI1+SI2+SI3+S4}{4}$$

Where
SI 1 = Standardized value of political and legal environment
SI 2 = Standardized value of socio-cultural environment
SI 3 = Standardized value of economic and technological environment
SI 4= Standardized value of micro environment

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

S. No	Indicator	Category	Class interval	Percentage
1.	Political and legal environment	Less favourable	11-19	46.70
		favourable	20-28	52.20
		Highly favourable	29-37	1.10
2.	Sociocultural environment	Less favourable	15-18	35.60
		favourable	19-22	44.40
		Highly favourable	23-26	20.00
3.	Economic and technological	Less favourable	11-16	18.90
		favourable	17-22	74.40
		Highly favourable	23-26	6.70
4.	Micro environment	Less favourable	22-29	46.70
		favourable	30-37	52.20
		Highly favourable	38-45	1.10

Results and Discussion

Data presented in table.2 shows that majority (46.70%) of the farmers felt agristartup environment as favourable followed by highly favourable (32.20%) and less favourable (21.10%). It is inferred from table 2 that 78 per cent of farmers felt that agristartup environment as favourable and above. It is due to that agristartups were helping the farmers to overcome the labour shortage and pest management practices regularly and also helpful in location specific services. It is illustrated from the table.2 that 21 per cent of farmers felt the agristartup environment as less favourable due to low mobile knowledge and difficulty in availability of location specific services from the agristartups on artificial intelligence.

Table 2: Favourableness of Agristartup environment on Artificial intelligence to farmers

S. No	Category	Class interval	Frequency	Percentage
1.	Less favourable	0.15-0.44	19	21.10
2.	Favourable	0.45-0.70	42	46.70
3.	Highly favourable	0.71-0.96	29	32.20
Total			90	100

Relationship between Profile of farmers and their agristartup environment

It is shown from the Table.3 that calculated 'r' values between farming experience, social networking, innovativeness and agristartup environment were greater than table 'r' value at 0.01 level of significance. Whereas, the calculated 'r' value of the variables digital literacy, extension contact, information seeking behaviour and agristartup environment were greater than the 'r' table value at 0.05 level of significance**.** The calculated 'r' value is greater than the table value at 0.05 level of significance. Hence, null hypothesis was rejected, and empirical hypothesis was accepted. Therefore, it can be interpreted, a positive and significant relationship between age, digital literacy, farming experience, extension contact, social networking, innovativeness, information seeking behaviour and agristartup environment. The variable social participation, negatively significant with agristartup environment. The calculated 'r' value is greater than the table value at 0.05 level of significance. Hence, null hypothesis was rejected, and empirical hypothesis was accepted**.** The calculated 'r' values between age, farm size and farm equipment possesion agristartup environment were less than the 'r' table value.

Table 3: Relationship between Profile characteristics of farmers and agristartup environment

S. No	Profile characteristics of farmers	Correlation coefficient(r)
1.	Age	0.132NS
2.	Digital Literacy	0.175**
3.	Farm size	0.077NS
4.	Farming experience	0.290**
5.	Social participation	-0.177*
6.	Extension contact	0.180**
7.	Farm equipment possession	0.028NS
8.	Social networking	0.258**
9.	Innovativeness	0.252**
10.	Information seeking behaviour	0.186*

**Significant at 0.0l level, *Significant at 0.05 level, NS= non-significant

It is interpreted that there was a significant positive relationship between variables digital literacy, farming experience and agristartup environment of farmers it is due to the fact farmers with middle, young age their age progresses they get more digital knowledge along with the farming experience with the agristartup indirectly influence the agristartup environment. The age, farm size variable is positive and has non-significant relation, this is due to farmers are using the services unrelated to their farmer size. The variable social participation is negative and significant, middle and young age farmers are digitally due lack of time and interested to try new technologies. The variable extension contact is positive and significant, due to more contact with extension personnel's would help individual to more exposure to agristartups on artificial intelligence. Farm equipment possession is positive and non-significant, because that machinery impact is very low. The variable innovativeness is positive and significant, this is due to middle and young age farmers, as they are aging they try new technologies. Information seeking behaviour is positive and significant relation, which would helpful in developing awareness and interest by listening to the other farmers testimonials.

Conclusion

Farmers perceived the political and legal environment as favourable and less favourable. It would helpful if the meetings, awareness programmes and trainings were conducted for creating awareness on the agristartups on artificial intelligence. In case sociocultural environment awareness need to be created on the agristartups on artificial intelligence**.** The economic and technological environment create importance in the usage of agristartups on artificial intelligence when agristartups are made easy and understandable. The microenvironment helps the farmers in when the agristartup entrepreneurs focuses on answering the queries and respond timely in giving services to farmers.

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