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A Study on the Technology Adoption of Farmers for Agriculture in Karur Area

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ABSTRACT

In the agricultural world, the technology adoption enhances sustainability and also efficiency in farming operations. The Karur zone is then within this intersection of tradition and also modernity for the agriculture. The aim of the research was to look into the farmers attitude towards adopting technology for agriculture farming, and to study the various factors that affecting the technology adoption of farmers in Karur region. Perception of farmers who are all adopted technology for their agriculture farming purpose were incorporated for this study, to evaluate the technology adoption of farmers in the specific region. The data were obtained from 350 farmers from the Karur district, Tamil Nadu, India. In this study (SPSS) Statistical Package for Social Sciences were used for preliminary and statistical analysis, the primary results of this research shows that the farmers in the specific region adopting themselves in technologies that used in agriculture farming.

Key Words: Agriculture technology, technology adoption, agriculture farming, farmers, attitude towards technology. Technologies.

I. Introduction

Through meticulous management and automation of farming activities in our modern society. The Agritech sector's implementation of technology has resulted in time savings and an increase in sustainability. The Karur region, with its origin in numerous farming traditions is an essential link between past and present nevertheless shows the marks of technological improvement. The new developments in agriculture will also shape rural communities' futures. To prove that technology is a force for change and it is essential to study the farmers' engagement rate with technology in Karur Locality. The aim of this investigation is to dispel confusion on the most widespread farming technological advances, problems that farmers have to contend along and how technologies influence the outcome of their crops

II. Statement of the problem:

We have chosen our research topic in part since we want to address the obstacles. The secondary factors which impact farmers in the Karur district as they adopt novel technologies. The study investigates into the introduction of technology, the issues, influences, and trends underlying the movements' adoption of new advancements. The greatest concern is that Karur farmers aren't enhancing their farming methods. The newest technologies available in traditional farming. This occurrence is caused by a group of factors, one of which is the lack of adoption of emerging technologies, which prevents advancements from improving yields in the agricultural sector.

III. Study significance

The research is within the confines of identifying what technological patterns farmers are adopting in Karur area with particular orientation toward agricultural activities. The broad aspects to focus on include the nature of technologies that were adopted, factors governing adoption decisions, challenges being ferried by farmers and benefits offered by technology towards enhancing productivity in agriculture. A clear understanding of enhancing technology adoption in the agricultural industry is enabled by this study, which contributes to ensuring that farming practices continue becoming sustainable in Karur area.

IV. Literature review

Adoption of technological advances in agriculture is essential to enhance the sector's sustainability, efficiency, and productivity. Numerous research works have examined the variables effecting farmers' adoption of current agricultural technologies. According to Rehman et al. (2016), Foster & Rosenzweig (2010), Carletto et al. (2007), and other scholars, availability, affordability, and predicted profitability are major variables that influence the adoption of technology. While gross margins and fluctuating product prices have an impact on the transmission of new technologies, land availability

increases experimentation and lessens credit constraints (de Janvry et al., 2011; Pingali et al., 1987). (Kijima et al., 2011; Minot & Daniels, 2005). Peer effects additionally give an understanding of the uses and benefits of these technologies (Oster & Thorton, 2009).

Research has examined the factors which influence the rate of technology adoption, market involvement in order and welfare effects. Awotide et al. (2016) discovered that while increased market involvement and welfare benefits are prompted by education, yields, and access to financial resources and inputs, higher levels of enhanced rice variety (IRV) adoption are driven by farm incomes, improved yields, worse loan availability, and extension services. Use of mobile internet technologies (MIT) by Pakistani wheat farmers was investigated by Khan et al. (2022), who pointed out that MIT has the potential to increase income, productivity, efficiency, and market access.

The influence of new media systems-driven agricultural extension models on technology adoption has been investigated (Yang et al., 2020). The investigators discovered that these models raise the rates of technology adoption, with benefits that vary depending on the size of the farm and the age group. Husen et al. (2017) evaluated the usage of irrigation, tractors, machinery, and commercial and organic fertiliser products; they observed that these factors led to increased yields, the emergence of hybrid crops, and labour savings.

Regarding yield levels and the introduction of technology, The consequences of farmer groups' involvement have been varied. (Mwaura, 2014). Abdullah and Samah (2013) identified enabling factors like education, openness to learning, media campaigns, and the technological literacy of extension workers, furthermore factors influencing the adoption of technology, such as adverse perspectives, levels of education, knowledge among extension workers, management procedures, and physical environment.

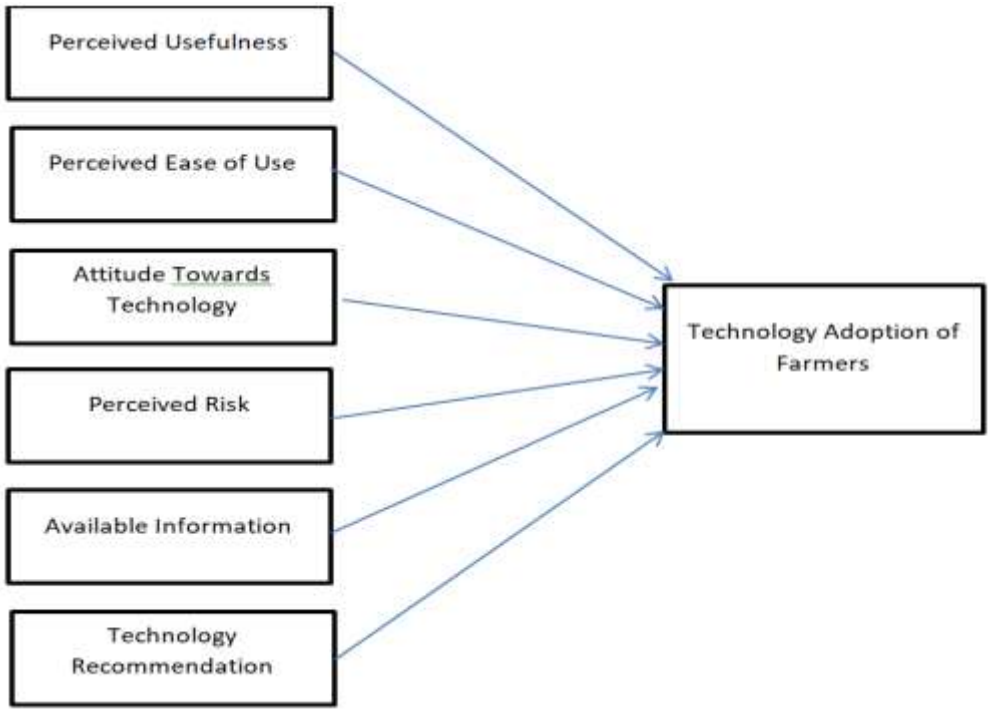
Investigation has also been explored on how technology adoption influences household welfare. According to Ayenew et al. (2020), the wellbeing of Ethiopia's smallholder farmers is positively and considerably impacted by the implementation of yield-enhancing technology, such as better wheat varieties. The benefits of professional teamwork on farmers' decision-making regarding the adoption of irrigation technology has been investigated through social network analysis (Ramirez, 2013).

Research on the connection between technological innovations accepted by farmers is also being done, and the results point to the adoption of approaches within a package in tandem (Rauniyar & Goode, 1992).

V. Research objectives

1. To understand the farmers demographic profile.
2. To examine the purposes for usage of technology for agriculture farming.
3. To find out the perceived use of technology for agriculture farming.
4. To understand the attitude of farmers towards technology and the perceived risk of farmers.
5. To find out the opinion of farmers towards technology adoption.

Research Framework



Hypothesis

H0: There is no strong association between education level of farmers and usage of type of machines for agriculture farming.

H1: There is a strong association between education level of farmers and usage of type of machines for agriculture farming.

H0: There is no strong association between farm size and usage of type of machines of farmers for agriculture farming

H2: There is a strong association between farm size and usage of type of machines of farmers for agriculture farming.

H0: There is no significant difference between monthly income of the farmers and perceived usefulness of technology for agriculture farming.

H3: There is a significant difference between monthly income of the farmers and perceived usefulness of technology for agriculture farming.

H0: There is no significant difference between monthly income of farmers and their attitude towards technology

H4: There is a significant difference between monthly income of farmers and their attitude towards technology.

VI. Methodology

Data collection and sample

To find the ways in which farmers using agricultural processes adopted technology, a quantitative, descriptive study methodology was used. A non-probability quota sampling technique has been used in the study to collect data from a sample of 350 study participants who have incorporated technology into their agricultural practices. The main instrument employed to collect information from the respondents was a structured questionnaire.

VII. Data Analysis

The Statistical Package for Social Sciences (SPSS) software was then used to analyse the data in order to shed light on the degree and trends of technology adoption among the farmers in the study population. Statistical techniques like reliability analysis, Regression analysis, ANOVA analysis used to evaluate technology adoption of farmers for agriculture farming.

VIII. Results and discussions

Profile of the respondents

Table 1 shows demographic profile of the farmers, the largest age group of the respondents were "Above 60" which is 27.4%, followed by "31-40" 26.9% and "41-60" which is 25.7%.The smallest age group among respondents is "Below 20" 4%. Majority of the respondents are Male which is 61.4%, And 38.6% were Female respondents, it is clear that majority of the respondents were married 65.7%, while 34.3% are unmarried. That the largest group of respondents has completed schooling 34.3%, followed by undergraduate (UG) education 32.6%.

12% of the respondents has a postgraduate (PG) degree, and 21.1% respondents have other qualifications. Out of 350 respondents largest income group is "60001-80000" 33.1%, followed by "20001-40000" 24%. 20.3% of the respondents has a monthly income below 20000. Majority of the respondents has either less than 1 acre 31.7% or more than 10 acres 30% of farmland. 20% of respondents have 6-10 acres, and 18.3% have 2-5 acres.

Construct reliability and validity analysis for technology adoption dimensions

Table 2 shows the component and total reliabilities of with a Cronbach's alpha value of 0.886, the results show that the collected data had an excellent degree of internal consistency. The questionnaire's elements appear to be highly connected to one another and assess the same underlying construct with reliability, based on the high alpha coefficient. As a result, the details gathered from these surveys can be recognised reliable and trustworthy for additional examination and deduction. Table 3 shows the adjusted R Square value in this case it is .693 this indicates that six independent variables (Perceived usefulness, Perceived ease of use, attitude towards technology, Perceived risk, Available information, Technology Recommendation.) in our model account for 69.3% of variance in the dependent variable- Technology adoption. Table 4 contains item means and standard deviations.

Chi-Square Analysis

Table 5 interprets the relationship between education level of farmers and usage of type of machines. The Pearson Chi-Square value of 170.834 with 21 degrees of freedom has a p-value of 0.000, which is highly statistically significant. This suggests a strong association between education level of farmers and usage of type of machines, and table 6 looks at the relationship between farm size and usage of type of machines. The Pearson Chi-Square value of 186.475 with 21 degrees of freedom has a p-value of 0.000, which is highly statistically significant. This indicates a strong association between farm size and usage of type of machines.

ANOVA Analysis

Table 7 shows that the significance P value is 0.000 is less than 0.05. Hence, null hypothesis is rejected. Thus, there is a significant difference between monthly income and perceived usefulness. Table 8 shows that the significance P value is 0.000 is less than 0.05. Hence, null hypothesis is rejected. Thus, there is a significant difference between age and attitude towards technology.

Table 1 Demographic profile of the respondents

Particulars	Frequency	Percent	Cumulative Percent
Below 20	14	4	4
21_30	56	16	20
31_40	94	26.9	46.9
41_60	90	25.7	72.6
Above 60	96	27.4	100
Male	215	61.4	61.4
Female	135	38.6	100
Married	230	65.7	65.7
Unmarried	120	34.3	100
Schooling	120	34.3	34.3
UG	114	32.6	66.9
PG	42	12	78.9
Below 20000	71	20.3	20.3
20001-40000	84	24	44.3
40001-60000	79	22.6	66.9
60001-80000	116	33.1	100
Less than 1 Acre	111	31.7	31.7
2-5 Acres	64	18.3	50
6-10 Acres	70	20	70
More than 10 Acres	105	30	100

RELIABILITY ANALYSIS:

Table 2 Reliability Analysis

Reliability Statistics	
Cronbach's Alpha	N of Items
.886	45
SOURCE: Primary data. Processed by SPSS V.20	

Regression Analysis

Table 3 Regression Analysis

R	R Square	Adjusted R Square	Std. Error of the Estimate
.833[a]	.693	.688	.55464

Table 4 Mean, Std. deviation

	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Usefulness	350	1.20	5.00	3.9109	.91823
Perceived Ease of Use	350	1.00	5.00	3.5394	1.27447

Attitude Towards Technology	350	1.00	5.00	3.7766	1.15315
Risk	350	1.00	5.00	3.4057	1.03512
Available Information	350	1.00	5.00	3.1691	1.08776
Technology Adoption	350	1.00	5.00	3.6531	.99260
Valid N (list wise)	350				
Source: Primary data. Processed by SPSS V.20					

Table 5 Education level of farmers and Usage of Type of Machines

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square Vlue	170.834[a]	21	0
Likelyhood Ratio	200.032	21	0
Linear-by-linear association	2.935	1	0.087
Source: Primary data. Processed by SPSS V.20			

Table 6 Farm Size and Usage of Type of Machines

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square Vlue	186.475[a]	21	0
Likelyhood Ratio	245.058	21	0
Linear-by-linear association	3.622	1	0.057
Source: Primary data. Processed by SPSS V.20			

Table 7 ANOVA, Monthly income of farmers and perceived usefulness of technology

		Sum of Squares	df	Mean Square	F	Sig.
Perceived Usefulness	Between Groups	21.559	3	7.186	9.118	0.000
	Within Groups	272.7	346	0.788		
	Total	294.259	349			
Source: Primary data. Processed by SPSS V.20						

Table 8 Age of the respondents and their attitude towards technology

		Sum of Squares	df	Mean Square	F	Sig.
Attitude Towards Technology	Between Groups	144.032	4	36.008	38.814	0.000
	Within Groups	320.056	345	0.928		
	Total	464.088	349			
Source: Primary data. Processed by SPSS V.20						

Conclusion and implications

The purpose of the study was to determine whether or not the farmers in the Karur area of Tamil Nadu, India, use agrotechnologies. The results indicated a high rate of adoption of current technologies depending on attributes such as utility, convenience of utilisation, mindset towards changes and technology, potential dangers, quantity of knowledge, and recommendations with regard to the technology.

According to the demographic investigation, more than 60% of the farmers surveyed were 60, suggesting that traditional farmers take advantage of technology to address difficulties related to sustainability of the environment and resources in farming. In terms of the kinds of machinery used, it was discovered that the type of technology used improved in conjunction with the number of farmers 'landholdings and their educational attainment, exhibiting an upward correlation between larger landholdings and higher levels of education and technology adoption.

In general terms, it can be claimed that Karur farmers themselves showed that they were willing to use technologies in their farming endeavours. A separate analysis revealed that the factors that are independent explain for nearly 69.3% of the overall variance in technology adoption for the same. This highlights the significance of taking into account the technical constraints in order to promote the adoption of contemporary farming practices.

For those in the driver's seat of policy, extension services for agricultural products, and technology providers, the findings have the following implications When tailoring their approach, extension agents for agriculture should consider several factors such as farm sizes and farmer education levels. Small-scale and less educated farmers are susceptible to further assistance with their applications.

Extension initiatives, and internet platforms, and farmer cooperatives can facilitate farmers' access to what knowledge they require. These details ought to be reliable and current.

Farmers' adoption of technology might expedited through the use of schemes like insurance coverage, financial assistance, or experimental projects.

It is necessary for technological companies to set aside time for advancing the creation of agricultural solutions that are intuitive and user-friendly, generated to the diverse requirements and skills of farmers.

It is crucial to to encourage producers, particularly those who were originate from short of resources or impoverished communities, to adopt revolutionary technologies through the enforcement inclusive policies which give incentives.

For a more through deployment of green technologies in farming as well as for the empowerment of farmers and their families in Karur and elsewhere, such problems might be thoroughly studied and addressed.

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