A Perceptual Study on Adoption of Technology in Farming: A Descriptive Analysis using Tam

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Abstract

In the present study we analyze the farmers’ perception towards adoption of technology such as ITC for better productivity in farming. The considered constructs are adopted from Technology adoption model (TAM). A total sample of 800 farmers from the Guntur district are collected through simple random technique and out of which survey respondents irregular responses are eliminated finally 756 samples are determined for statistical analysis. Chi-square test was performed to determine the association between perceptions and model constructs. Results are reported and discussions are made as per the results and in correlation between results and previous literature and finally, suggestions and future indication for extension of the study are proposed.

Keywords: Technology, Farming, Ease of Use, Usefulness, Intention

I. Introduction

Over the past five decades, the government's agricultural policy objectives and the tools used to achieve these objectives have changed from time to time, depending on internal and external factors. Sector-level agricultural policy can be further subdivided on the supply side and the demand side [IV]. The first includes areas related to agrarian reform and land use, development and diffusion of new technologies, public investment in irrigation and rural infrastructure, and support for agricultural prices (Mahadevan, 2003; Mukherjee and Kuroda, 1997, Singh, 2010). Demand-side policies, for their part, include government interventions in agricultural markets and the operation of public distribution systems[V] [VI]. These policies also have macroeconomic effects in terms of impact on public budgets [IX]. Policies at the macro level include policies to strengthen linkages in agriculture and non-agricultural activities, as well as industrial policies that affect the supply of raw materials for agriculture and the supply of agricultural equipment [XI].
I.i. Objectives of the Study

To review the literature with regard to technology adoption feasibility in farming which in turn leads to productivity.

To empirically analyze the perceptions of farmers towards technology (ICT) adoption for enhancement in productivity

II. Literature Review

Indian farmers face natural problems such as drought, floods, deforestation and natural disasters due to large geographical disparities as well as infrastructure problems[XVIII]. Farmers' bargaining power is not strong because they pay high-priced inputs and cannot sell their products on the market at high prices, resulting in a general loss of their net income [XIX]. At the time of technological development and innovation, information and communication technologies have the power to change the state of agriculture in India[XX]. The rural population relies to a large extent on agriculture because of the lack of alternative employment opportunities, which makes the current study of strategic importance (Jain, 2017). Based on TAM, the researcher developed and tested FTAM in China's development after incorporating certain concepts, such as social influence, innovation, job relevance, personal effectiveness and relative advantage[XXI]. As an independent variable. All FTAM constructs have sufficient theoretical support. The results of the study showed that some TAM constructs have a direct and indirect effect on the adoption and intention of computer scientists to develop and use them (Jain, 2017, Reddy, 2005, Thi, Chi and Yamada 2002)[XXII].

II.i. Research Questions

1. Does Perceived Usefulness of Technology (ICT) influence its adoption for farming?
2. Does Related Advantage of Technology (ICT) influence its adoption for farming?
3. Does Perceived Ease of use of Technology (ICT) influence its adoption for farming?
4. Does Intention to Use Technology (ICT) influence its adoption for farming?

The information-based agricultural agriculture system (precision farming) is designed to maximize agricultural production and is often described as the next major development in agriculture. The combination of global positioning system (GPS) and mobile mapping should provide farmers with the information they need to implement precision farming based on decisions (Mittal and Tripathi, 2009). In the Indian context, the use of mobile phones as a means of providing information on agriculture will depend on the extent to which the mobile network has been able to link farmers to market information in a timely manner. and precise (Jain, 2017, Mittal and
Tripathi, 2009, Mukherjee and Kuroda, 2003, Shahabinejad and Akbari, 2010, Thi et al., 2002). The impact on productivity can be measured directly in terms of higher yield for farmers, with a decreasing effect on crop patterns and potential yield of planted crops. Information on price factors: input and output prices, and non-price factors, such as information on input availability, seed quality, modern techniques, etc., will play the main role. to improve agricultural productivity.

II.ii. Hypothesis Formulation

H1: Perceived Usefulness of Technology (ICT) positive significantly influences its adoption for farming.

H2: Related Advantage of Technology (ICT) positive significantly influence its adoption for farming.

H3: Perceived Ease of use of Technology (ICT) positive significantly influence its adoption for farming.

H4: Intention to Use Technology (ICT) positive significantly influences its adoption for farming.

III. Methodology

To test the hypothesis the demographic characteristics such as gender, age, marital status, qualification monthly income and experience in farming are cross tabulated towards hypothesized statements and its association was tested using chi-Square test. A total sample of 800 farmers from the Guntur district are collected through simple random technique and out of which survey respondents irregular responses are eliminated finally 756 samples are determined for statistical analysis.

IV. Proposed Model
IV.i. Demographics of the Respondents

From a total 756 respondents about 70.1 percent are male and the rest 29.9 percent are female. With respect to age of the respondents about 36.8 percent are in the age of 25-35 years and majority 40.7 percent are in the age of 35-45 years of age. All the respondents about 92.6 percent are married and the rest are not. It is amazing that about 33.3 percent of the farmers are graduates and the rest about 61.6 percent are SSC Qualified. About 45.8 of the respondents earn Rs. 20,000 to 30,000 of salary and finally about 45.8 percent possess 2-5 years of experience in farming in tropical and seasonal times.

IV.ii. Descriptive Analysis: Testing Hypothesis

H1: Perceived Usefulness of Technology (ICT) in Farming.

Fig.1. Proposed Model
Table 1. Perceived Usefulness of Technology (ICT) in Farming

V. Analysis

The cross-tabulation results for farmers perception on Perceived Usefulness of Technology (ICT) in Farming with the qualification of the farmers has revealed that (22.225, df8, <0.05) there is a significant association between them. The cross-tabulation results for farmers perception on Perceived Usefulness of Technology (ICT) in Farming with the monthly income revealed that (24.990, df12, <0.05) there is a significant association between them. The cross-tabulation results for farmers perception on Perceived Usefulness of Technology (ICT) in Farming with the years of Farm Experience with the question asked revealed that (27.984, df12, <0.05) there is a significant association between them.

H2: Related Advantage of Technology (ICT) in Farming.
The cross-tabulation results for Related Advantage of Technology (ICT) in Farming with the qualification of the farmers has revealed that \((7.188, df=8, >0.05)\) there is no significant association between them. The cross-tabulation results for Related Advantage of Technology (ICT) in Farming with the monthly income revealed that \((12.862, df=12, >0.05)\) there is no significant association between them. The cross-tabulation results for Related Advantage of Technology (ICT) in Farming with the years of Farm Experience with the question asked revealed that \((25.961, df=12, <0.05)\) there is a significant association between them.

H3: Perceived Ease of use of Technology (ICT) in Farming.

Table 2: Related Advantage of Technology (ICT) in Farming

V.i Analysis

The cross-tabulation results for Related Advantage of Technology (ICT) in Farming with the qualification of the farmers has revealed that \((7.188, df=8, >0.05)\) there is no significant association between them. The cross-tabulation results for Related Advantage of Technology (ICT) in Farming with the monthly income revealed that \((12.862, df=12, >0.05)\) there is no significant association between them. The cross-tabulation results for Related Advantage of Technology (ICT) in Farming with the years of Farm Experience with the question asked revealed that \((25.961, df=12, <0.05)\) there is a significant association between them.
Table. 3. Perceived Ease of use of Technology (ICT) in Farming.

V. ii. Analysis

The cross-tabulation results for Perceived Ease of use of Technology (ICT) in Farming has revealed that (4.842, df8, >0.05) there is no significant association between them. The cross-tabulation results for Perceived Ease of use of Technology (ICT) in Farming with the monthly income revealed that (10.013, df12, >0.05) there is no significant association between them. The cross-tabulation results for Perceived Ease of use of Technology (ICT) in Farming with the years of Farm Experience with the question asked revealed that (16.015, df12, >0.05) there is no significant association between them.

H4: Intention to Use Technology (ICT) in Farming.

Table. 4. Intention to Use Technology (ICT) in Farming.
VI. Results and Discussions

The cross-tabulation results for farmers perception on Perceived Usefulness of Technology (ICT) in Farming with the qualification of the farmers has revealed that (22.225, df8, <0.05) there is a significant association between them, hence H1 is proved. The cross-tabulation results for Related Advantage of Technology (ICT) in Farming with the years of Farm Experience with the question asked revealed that (25.961, df12, <0.05) there is a significant association between them hence H2 is proved. The cross-tabulation results for Perceived Ease of use of Technology (ICT) in Farming with the years of Farm Experience with the question asked revealed that (16.015, df12, >0.05) there is no significant association between them hence H3 is disproved. The cross-tabulation results for Intention to Use Technology (ICT) in Farming with the years of Farm Experience with the question asked revealed that (18.180, df12, <0.05) there is no significant association between them hence H4 is proved.

VI.i. Implications and Further Research

States of India where agriculture is the main occupation of the state's inhabitants. The respondents who completed the questionnaire were contacted personally, but the circumstances under which the test was conducted were not checked. Therefore, it is not known whether the conditions were still optimal for such a test, such as time, sincerity, distractions, and no source of bias, and the test ended in one session without interruption. Sometimes the researcher had to leave the questionnaire to the respondents for later interpretation (Jain, 2017). It could have been better for respondents to complete the questionnaire under the best test conditions and under the best possible control. The current study took into account a limited number of demographic indicators, while in the future other variables such as household composition, ethnicity, social class, etc. It can be taken into account for a similar study (ALI, 2005; Amin & Li, 2016; Barker, Dawe, & Inocencio, 2003; Jain, 2017;
Jin et al., 2019; Mahadevan, 2003; Mittal & Tripathi, 2009; Mukherjee & Kuroda, 2003; Reddy, 2005; Shahabinejad & Akbari, 2010; Singh, 2010; Stiroh, 2019).

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