



“Farmers’ attitude towards Knowledge and Utilisation of Information and Communication Technology (ICT) in Agricultural Sector- A case study in Upper Brahmaputra Valley Zone of Assam”

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Abstract: Information and communication technologies (ICTs) have a great role in changing the existing traditional agricultural system in developing countries. Through the application of ICTs in agriculture it is possible to; make efficient information dissemination, bring precision agriculture, production decision and increase market access of farmers. Now-a-days, most of farmers of developing countries majority of rural farmers’ have access to ICT tools, however, farmers have not enough awareness of the significance role of ICTs for agricultural production and marketing and its subsequent impact on welfare improvement. In this context, present paper is an attempt to study the attitude of the farmers’ towards knowledge and utilization of ICT in agriculture in the Upper Brahmaputra Valley Zone of Assam. The regression coefficients values of independent variables for knowledge of ICT tools were -.003 for age, .142 for education, -.003 for farming experience, .010 for land holding, 3.45 for income, .534 for mass media participation, -.087 for extension contact, and 0.096 for agricultural enterprise respectively. The regression coefficients values of independent variables for utilization of ICT tools were -.011 for age, .173 for education, -.001 for farming experience, .003 for land holding, -2.08 for income, .371 for mass media participation, -.083 for extension contact, and 0.017 for agricultural enterprise respectively.

Keywords: ICT, Agricultural Sector, knowledge, utilization, farmers’ attitude, Brahmaputra Valley Zone

1. Introduction

India's agriculture industry has long faced a variety of difficulties. The introduction of information and communication technology (ICT) is appropriate in light of these difficulties. The Green Revolution's advantages significantly increased agricultural productivity. On the other hand, there is clear evidence that a new revolution in inputs, production techniques, and post-production activities is required, one that will benefit farmers and consumers alike. For a considerable amount of time, policymakers have been looking for practical ways to solve the long- and short-term problems in agriculture, including how to satisfy farmers' insatiable information needs. One of these possibilities is ICT, which has recently shown amazing promise for enhancing agriculture, particularly in underdeveloped nations.

The equipment used to store and analyze scientific and agricultural data was originally only accessible to a select few due to its high cost and energy consumption. However, technology has advanced significantly since then. ICT has become ingrained in the operations of even the poorest smallholder farms thanks to the growth of the Internet, wireless, and mobile businesses. Given the growing investments in agricultural research, the private sector's keen interest in the advancement and dissemination of ICT, and the growth of organizations dedicated to the agricultural development agenda, the potential of ICT to revitalize agriculture looks even more compelling.

ICTs have the power to drastically change communication practices, which could positively impact the agricultural ecosystem as a whole. The idea that ICT might give a company a competitive edge by enhancing its expertise is widely held, and this research would like to investigate this possibility. Technology is a key facilitator and tool for implementing knowledge management, but it is not the main force behind it. An effective information and communication technology strategy will: take into account the needs of the present without neglecting the future; follow recognized standards to guarantee optimal compatibility and sharing; provide a clear upgrade path to facilitate scaling up; make it easily accessible to the intended users; and guarantee data security and integrity. In this context, developing a positive attitude among farmers for knowledge and utilization of ICT, a desperate move is required.

An important part of Assam's economy is agriculture. Assam is mostly reliant on the agricultural Sector. Natural resources abound in Assam, including copious amounts of rainfall, alluvial soil, and a rich and varied genetic foundation of plants

and animals. Rivers throughout the state provide ample water, while irrigation systems provide water to the agricultural land. In Assam, 70 percent of the population depends on agriculture either directly or indirectly. Despite having an abundance of natural resources, the state is not as developed as the rest of India.

The cultivation in Assam is characterized by several problems from which some are natural and others are manmade such as natural disaster, small and fragmented land holding, lack of quality seeds and adequate fertilizer, proper irrigation facility etc. In this context, ICT can play a vital role in the development of the agricultural sector.

2. Literature Review

Even though science has advanced significantly, there is still a significant divide between the broad concept used to describe the tools and processes to access, retrieve, store, organize, manipulate, produce, present, and exchange information via electronic and other automated means and the productive technologies that are currently available. This is because a large portion of farmers lack awareness and are illiterate. A wide range of technologies are involved, ranging from traditional ones like radio and television to more modern ones like computers, multimedia, the internet, and satellite-based communication systems.

The market of the new millennium requires that a larger segment of the population possess in-depth, current knowledge and expertise in the relevant subject. Information and communication technologies (ICTs) have revolutionized technology transfer by making information from various sectors quickly and accurately available. This is due in part to the high cost of disseminating information through face-to-face interaction and the declining value of extension services.[1]

ICT application has grown to be an important pillar of agricultural extension because it can help rural communities become prosperous by providing the necessary information in timely, cost-effective, and easily accessible ways.[3]

With the development of information and communication technologies (ICTs), it may be possible to maximize the return from agricultural operations by disseminating knowledge. [2] ICTs have a role in the administration of agricultural knowledge. For the agricultural community, it aids in the creation, acquisition, storing, and dissemination of agricultural knowledge. [6] ICTs have made a significant contribution to modernizing the conventional marketing method used in the majority of developing nations. [5] It is also a potential field that can increase

agriculture's production, efficacy, and efficiency. [4] 2012). ICT is now being used in agriculture, notably in the marketing of agricultural goods, to enhance farmers' decisions in developing nations [7].

ICTs play a significant role in providing the farming community with relevant information. The farmers may get information on the date, location, and types of customers for their products using ICTs. [8,9] This knowledge is essential for farmers to follow a market-oriented production system, make decisions about where and when to sell their agricultural goods, and to increase their bargaining power. Digital technologies have the potential to improve agricultural supply chain management, overcome information difficulties, expand market access, and promote knowledge transfer by offering extension services.[10] Additionally, ICTs enhance communication between researchers, farmers, and policymakers, which is essential to enhancing the productivity of small and marginal farmers, enhancing their selling capabilities, and ensuring their position to provide food security to the individuals. ICTs can hasten the development of rural areas overall and the agricultural sector in particular. [11] Most rural farmers in developing nations live distant from markets and lack access to pertinent market information. Farmers are thus taken advantage of by traders and receive cheap prices for their goods.[12] Farmers in the area rely on ancient methods of communication, which prevents them from accessing markets. Additionally, farmers were forced to sell their goods in the local market due to information asymmetry, a lack of information openness, and a lack of trust between farmers and merchants, which allowed traders to profit more at the expense of farmers. [13] Therefore, if the goal is to reduce poverty in the agricultural community as a whole, using ICTs in agriculture is a very important.

3. Significance of the study

The findings of this study highlight the influence of different factors towards on acquiring knowledge and utilization of ICT among farmers. This will enable the policy makers to be in a position to understand the importance of different aspects for enhancing the knowledge and utilization of ICTs in the development of agricultural sector. This research also provides evidence based on a methodological assessment of the influence of some important factors pertaining to knowledge and utilization of ICTs among the farmers of Assam. It is therefore expected that the study will help the policy makers to formulate adequate policies for promoting knowledge and utilization of ICT in agricultural sector.

4. Scope and Limitation of the Study

This research was conducted to assess the influence of various factors in the knowledge and utilization of ICT among farmers of some selected districts of Assam. There is a huge scope to conduct such a study across the state covering more variables. Similarly, the size of the sample can also be increased to get a more diverse picture. This limits the generalization of the findings beyond the district to explain the general issues concerning ICT in the state.

5. Objectives of the Study

The study is designed in the context of following objectives.

- (a) To find the influence the attitude of the farmers on knowledge and utilization of ICT in agriculture.

6. Research Question

Based on the above objective the following tentative research questions is proposed.

- (a) Whether, education, age, gender, place, income, farm size, farming experiences and other factors have any significant influences in the attitude of the farmers pertaining about knowledge and utilization of ICT in agriculture?

7. Methodology

7.1. Universe of the Study

The proposed research is carried out in the Upper Brahmaputra Valley Zone of Assam. For the research purpose, four Districts namely Dibrugarh, Sivasagar, Jorhat and Golaghat are selected purposively because of high dependency on agriculture. Accordingly, these four districts are the universe of the study.

7.2. Sample Size

Multistage sampling methods are used in the proposed study. Four Districts mentioned above are selected in the first stage purposively because of high dependency on agriculture. In the second stage four village from each selected district are considered for primary data collection. From each village a total of ten farmers are selected randomly. Accordingly, total sample are one hundred and sixty.

7.3. Sources of Data

To analyze the ground reality both primary and secondary data of relevant aspects will be collected from the proposed Districts.

- (i) **Primary Data:** A set of structured questionnaires are designed for collecting the primary data. Through direct personal investigation and field visit in the selected places are the prime source of data.
- (ii) **Secondary Data:** Required secondary Data are collected from Annual Reports of Govt. of India, various reports of Govt. of Assam and other relevant books, journals and offices.
- (iii) **Data Analysis:** Multiple linear regression analysis was used to find the contribution of the independent variables to the attitude of farmers pertaining to acquire knowledge and utilization of ICT projects. The functional form of regression equation used

$$\text{was, } Y_a = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_8X_8 + u$$

$$\text{was, } Y_b = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_8X_8 + u$$

Y_a: Knowledge

Y_b : Utilization

X₁ : Age

X₂ : Education

X₃ : Farming experience

X₄ : Size of land holding

X₅ : Income

X₆ : Extension contact

X₇ : Mass media utilization

X₈ : Crop enterprise

8. Findings and analysis

Based on the field study conducted in the four selected districts of upper Brahmaputra Valley Zone of Assam following findings are found.

Table: Result of Multiple Linear Regression of independent variables with dependent variables

Variables	Regression Coefficient		Standard Error		T values	
	Knowledge	Utilization	Knowledge	Utilization	Knowledge	Utilization
Content	-.240	.352	.339	.337	1.043	-.708
Age	-.003	-.011	.005	.005	-2.182	-.515
Education	.142	.173	.040	.040	4.314	3.535
Farming Experience	-.003	-.001	.006	.006	-.150	-.574
Land Holding	.010	.003	.006	.006	.417	1.602
Income	3.45	-2.08	.000	.000	-.271	.448
Mass Media Participation	.534	.371	.101	.101	3.691	5.288
Extension Contact	-.087	-.083	.058	.058	-1.424	-1.490
Agricultural Enterprise	.096	.017	.073	.073	.236	1.312

Knowledge R² = 0.480, Standard Error of Estimate.3379 DW, Value 2.094

Utilisation R² =0.530, Standard Error of Estimate.33649 DW, Value 2.032

Source: Calculated by researcher

It was seen from the table that out of the eight independent variables, five variables namely education, land holdings, income, mass media participation and crop enterprise. had positive and significant contribution in the attitude of farmers for knowledge and utilization of ICT projects while three variables namely age, farming experience and extension contact were found to have negative and contribution. in this study, according to the values of the coefficient of determination (R²), independent variables were responsible for explaining 48.0 % and 53.0 %, respectively, of the variation in ICT knowledge and use, while other factors were responsible for the remaining variation. So, additional research may be required to investigate the other variables that are affecting the understanding and use of ICT initiatives.

The regression coefficients values of independent variables for knowledge of ICT tools were -.003 for age, .142 for education, -.003 for farming experience, .010 for land holding, 3.45 for income, .534 for mass media participation, -.087 for extension contact, and 0.096 for agricultural enterprise respectively. The regression coefficients values of independent variables for utilization of ICT tools were -.011 for age, .173 for education, -.001 for farming experience, .003 for land holding, -2.08

for income, .371 for mass media participation, -.083 for extension contact, and 0.017 for agricultural enterprise respectively.

9. Conclusion

ICTs play a critical role in helping small-scale farmers make appropriate decisions that have the potential to significantly alter their livelihoods on a social and economic level. ICT promotes communication between farmers from various socioeconomic groups, provides quick access to information needed for purchasing, manufacturing, and selling goods, and increases production. Farmers have a significant impact on the distribution of wealth and resources through their access to, ownership of, and use of ICTs. Globalization is predicted to improve market dynamics and economic efficacy both inside and between nations. It is required to develop a positive attitude among farmers for acquiring knowledge and utilizing ICT tools in the agricultural sector. To develop a positive attitude among farmer, the State Department of Agriculture, Agricultural University, and KVK should also do needful in terms of regular training and providing awareness. Government should also encourage farmers through some subsidized program. In a state like Assam more emphasis should be given by the government. Similarly, educational and research institute can play a crucial role to in developing a positive attitude among farmers.

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