"Knowledge and Utilisation of Information and Communication Technology (ICT) in Agricultural Sector, its problems and prospects- study in Upper Brahmaputra Valley Zone of Assam, India"

Abstract

Agriculture is different from other industry and it plays a vital role in the economic development of a country. In a country like India, its prosperity depends upon the development of agricultural. There are different sorts of agricultural products that have been produced in India and therefore the production and marketing of these farm products is quite difficult. Awareness of farmers regarding different methods of production, components of market information and its utility is generally very poorwith compared to the traders. In this context, Information and communication technologies (ICTs) have a great role to change the existing traditional agricultural system in developing countries. An attempt is made to study the relationship between various socio-economic factors and knowledge and utilization of ICT in agricultural sector in Upper Brahmaputra Valley Zone of Assam. Apart from these, problems and prospects of using ICT in agricultural sector is also analysed in the study area. Through 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 the farmers of developing countries majority of rural farmers' have access to ICT tools, however, most of the farmers have no enough awareness on the significance role of ICTs for agricultural production marketing and its subsequent impact on welfare improvement. It is found that age and farm experienceare negatively associated with knowledge and utilization of ICT among farmers. On the other hand, education, land holding and income are found to have negative correlation with knowledge and utilization of ICT among farmers.

Keywords: ICT, Knowledge, Utilisation, Agricultural Sector

1. Introduction

The world is witnessing structural and transformational change with the advent of digital era. In this digital age, billions of inhabitants of this world have already got and within the coming decade most will have access to at least one or more personal digital devices. Today these digital devices also are getting used within the agriculture sector and more specifically in agricultural marketing for creating use of informed decisions. The market value information help actors in agriculture value chain make informed decisions that promote efficient production and trade. It is especially valuable for the producers that sell in local and regional markets. Such crucial information helps these producers to barter with traders, determine what markets to sell to, store their crops until increase or maybe plan for future crops It also facilitates spatial distribution of products from rural areas to towns and between markets (FAO) an enormous enabler for the section of the population which has remained unreached by other technology.

2. Significance of the study

The world is witnessing structural and transformational change with the advent of digital era. In this digital age, billions of inhabitants of this world have already got and within the coming decade most will have access to at least one or more personal digital devices. Today these digital devices also are getting used within the agriculture sector and more specifically in agricultural marketing for creating use of informed decisions. The market value information help actors in agriculture value chain make informeddecisions that promote efficient production and trade. It is especially valuable for the producers that sell in local and regional markets. Such crucial information helps these producers to barter with traders, determine what markets to sell to, store their crops until increase or maybe plan for future crops It also facilitates spatial distribution of products from rural areas to towns and between markets (FAO) an enormous enabler for the section of the population which has remained unreached by other technology.

3. Scope and Limitations

The aim of the present paper is to investigate the association between socio-economic variables and knowledge and utilization of ICT in agriculture sector. The study also covers the influence of socio-economic factors on use and knowledge of ICT in agriculture. An effort is also made to know some important constraints and give some suggestions. Lots issues are left out in the study due to numerous constraints.

4. OBJECTIVES OF THE STUDY:

The study is designed in the context of following objectives.

(a) To know the association between socio-economic factors and utilsiation and knowledge of ICT in agriculture.

(b) To know the constraints faced by the farmers while using the ICT in agriculture.

(c) Suggest appropriate measures for enhancing the use of ICTs in agricultural sectors

5. Hypothesis

Based on the above objectives the following tentative hypothesis are proposed.

(a) Is there any association betweeneducation, age, gender, place, income, farm size, farming experiences and other factors with knowledge and utilization of ICT in agriculture?

6. METHODOLOGY:

6**.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. Accordingly, these four districts are the universe of the study.

6.2: Sample Size: Multistage sampling methods are used in the proposed study. Four Districts mentioned above are selected in the first stage. 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.

6.3: Sources of Data: To analyse 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: To measure the relationship between knowledge and Utilisation of ICT in agriculture and various socio-economic factors, Karl Pearson correlation method have been used.

7. Result and analysis

Based on the field study conducted in the four selected districts of upper Brahmaputra Valley Zone of Assam, findings can be discussed in the following way.

Table 1: Association between socio-economic characteristics with knowledge and utilisation of ICTs

Sl No	Variables	Correlation coefficient	
		Knowledge	Utilisation
1	Age	-.510**	-.606**
2	Education	.564**	.640**
3	Farm Experience	-.275**	-.371**
4	Land Holding	.090	.026
5	Income	.140	.055
6	Mass media participations	.592**	.550
7	Extension contacts	-.048	-.102
8	Agricultural Enterprise	-.053	-.097

** Correlation is significant at the 0.01 level (2-tailed).

The relations between different variables and knowledge and utlisation of ICT tools are represented in the table. It can be discussed in detail in the following ways:

Age: Age was found to be negatively and significantly correlated with both usage (-0.510) and knowledge (-0.606). It was found that the older a person is, the more inclined he is to view the world traditionally. So, it might be more difficult to persuade him and alter his attitude and impression of modern technologies. Instead to this, a person's willingness to explore new things like ICTs and tolerate change is more in case of younger person. These results are consistent with those of Samatha (2011), whose study discovered a negative and substantial association between age and ICT use.

Education: Education was found to have a significantly substantial and favourable association with both knowledge (0.564) and utilisation (0.640). Educated farmers are oriented with use of ICT in agricultural sector. The attainment of a formal education also aids in the rational interpretation of information, which leads to practical decision-making. ICT usage calls for a certain level of operating expertise, which can be learned through education. Thus, the results appear to be rational. The findings are consistent with research of Meena et al. (2011), who revealed a favourable and substantial relationship between education and attitude towards ICTs.

Farming experience: It was found that there was a negative and substantial correlation between "farming experience" and both knowledge (-0.275) and usage (-0.371) of ICT initiatives. In most cases, farming is a hereditary profession, and most farmers begin their work while they are quite young. So, the older a farmer gets, the more experience he gains in farming. The negative relationship between agricultural experience and knowledge and usage appears plausible given that it was found that age was negatively related to both knowledge and use of ICTs. These results are consistent with Samatha's (2011) research findings, which showed a negative and substantial relationship between farming experience and ICT use.

Size of land holding: It was found that there was a very low correlation between land holdings and in knowledge(0.126) and utlisiation.(0.102). The amount of land a farmer owns is typically inherited from their ancestors and has no relationship with their level of education, propensity for innovation, contact with extension agents, or globalisation. The findings appeared to be accurate because the farmers with high ICT expertise and project usage had a variety of land holdings, ranging in size from small to large. These results are consistent with those of Dhaka and Chayal (2010), who found no connection between attitude towards ICTs and the size of one's landholding.

Income: it is found that income play a significant role both in knowledge and utilization of ICT in agriculture. It is found that there are some association between income and knowledge of ICT (.214) and utilization (.192). The reason is very obvious that with the level of income farmers are able to access and utilize the ICT tools for agricultural operation.

Mass media participation: It was found that there was an association between utilization of ICT (0.592) and mass media participation similarly a favourable and substantial (0.550) relationship with knowledge. There was extensive media promotion for the ICT projects, including radio, television, agricultural publications, etc. The likelihood that a farmer will learn about ICT projects increases with his participation in the media. As a result, the results appear to be explicable. These results are consistent with those of Hagemanty (2011), whose study found a beneficial relationship between using ICTs and participating in the media.

Extension contact: It was revealed that there is a strong correlation between knowledge of ICT (-0.048) and their use (-0.102) with extension contact . A farmer had a greater likelihood of being introduced to ICT initiatives by any source the more extension contacts he had. As a result, the positive association between the variables is easily explicable and makes sense. These results are consistent with those of Shakir et al. (2013), who found a favourable relationship between agricultural extension services and usage of internet or any other ICT tolls.

Crop enterprise: The sort of crops the farmers were cultivating and knowledge and utilization of ICT is found to be negative. The results demonstrate that relationship of the farmers' choice of ICTs for information gathering haslimited role to do with the sort of crop they are growing. It is -.053 for knowledge and -.097 for utilization.

8. Constraints faced by the farmers in effective utilisation of ICTs

The following are the main constraints faced by farmers for using ICT in agriculture in Upper Brahmaputra Velly Region of Assam.

a. **Lack of adequate skills to use ICTs:** Approximately three-fourths of the farmers acknowledged that the main obstacle to of utilising ICTs is the lack of necessary skills for them to operate ICT tools. Rural farmers were unfamiliar with ICT tools because they require only a minimal level of competence to use them. As a result,

training sessions were required to be held at the village level through organizations, panchayats, and other local entities.

b. **Lack of proper infrastructure:** Two thirds of the farmers stated that a major constraint is the absence of adequate infrastructure, such as regular energy, internet access, and computer centres. The issue of ICT services not being as widely available in rural areas can be solved by encouraging business owners to open ICT service facilities like kiosks and internet cafes.

c. **Lack of awareness about different ICTs:** Nearly half of the farmers believe that the biggest obstacle is their ignorance of the various ICT projects and how they operate. Effective mass media advertising through radio, television, and other channels, as well as organising awareness campaigns through regional organisations like panchyats, cooperatives, and schools, are two ways to combat it.

d. **Lack of reliable content online:** Approximately 45% of farmers stated that the main obstacle is the dearth of trustworthy and current web content. The majority of webpages offer broad solutions to general issues, but farmers demand more accurate information that is regionally specialised and frequently updated. The ICT projects should emphasize consistently upgrading the web information to meet farmers' expectations.

e. **High cost of ICT tools:** According to research, 42.14 percent of farmers still believe that the high cost of ICT instruments is a significant issue. Encouragement of community ownership of the ICT infrastructure can help with this. A personal internet facility that offers services at affordable pricing to rural residents can also be started with the help of local youngsters.

9. Suggestions to improve the utilisation of ICTs

(i) **Providing training to farmers:** More than three-quarters of farmers (74.29%) believed that training in using ICT tools will help them improve their ability to find the information they need online through various websites.

(ii) **Providing adequate knowledge of different ICT tools:** Almost 67% of farmers believed they ought to be given sufficient training in various ICTs so they can understand the services each project offers and utilise them appropriately.

(iii) **Linking ICT projects with other services:** It was revealed that 61.43 per cent of farmers suggested linking of ICT projects with input supply and crop produce procurement services, as in case of swand kendra will help in increasing the popularity of ICTs.

(iv) **Connecting farmers and agri- experts** : More than half of the farmers (57.14%) suggested that connecting farmers and agri-experts through ICTs will be helping them in clearing their doubts and queries related to farming, directly.

(v) **Channelizing ICTs through farmer organisations :**More than half the farmers (53.57%) suggested that it will be useful, if ICTs can be channelized through farmer groups and organisation, which will be help the information flow in the organisations and also collective decision-making.

(vi) **ICT should link all the stakeholders in agriculture**: About half of the respondents (48.57%) agreed with the idea that ICTs should connect all agricultural players, including farmers, input dealers, Agri-universities, commercial businesses, and marketing agencies, in order to facilitate effective use of ICTs by all stakeholders.

(vii) **ICT projects should concentrate on updating relevant content:** About 45 per cent of the still feels that ICTs were not providing relevant and updated regional specific information and suggesting ICT projects should concentrate on updating relevant content in their respective projects specially in local language.

10. Conclusion

Food, shelter and clothing are one of the three basic needs of life. Among the three, only one is needed to stay alive, food. Food security has become a global issue especially in recent times. Hence, the importance of agriculture cannot be overemphasized. As in every other sector, constant research in the agriculture sector is needed if it must stay in tune with advances in technology so as to meet the ever-growing demand for its produce more so with the new trend of eco-friendly green world campaign. This has put more pressure on agriculture produce which are the most eco-friendly resources available (e.g. use of grains in fuel production). ICT has impacted positively every sector of the economy. Agriculture being a part of the economy is yet to witness any meaningful widespread impact by ICT. It is in this light some recommendations are also given for increasing the use of ICT in agricultural sector.

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