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Abstract

Information and Communication Technology (ICT) can be used as a potential tool to develop rural India, but the awareness and positive attitude towards the facilities offered by it is a necessity to use it to the full potential. The study tries to analyze the awareness of farmers about the various ICT tools in agriculture. Survey using questionnaire was resorted to collect data from user group. The user group under consideration consists of farmers registered to four KrishiBhavans in Nedumangad block, Thiruvananthapuram District of Kerala. Farmers with more than 1 acre of land registered in KrishiBhavans in the four selected blocks were 1040. From them, a sample size of fifteen percentages (156) of farmers is selected. Data obtained through questionnaire was tabulated, analyzed and interpreted using Microsoft Office Excel 2010 and SPSS 20. Chi-square test was applied for finding significant association between the categorical variables.

Keywords::*ICT awareness, ICT use, Farmers, Thiruvananthapuram, Kerala*

1. INTRODUCTION

Science and technology information is an important resource for accelerating national development in all sections and at all levels. Agriculture plays a dominant role in Indian economy contributing nearly half of the national income. The progress of India depends on the development of its agriculture and allied sectors. Agriculture can serve as an important engine for economic growth. Introduction of Information and Communication Technology (ICT) in agriculture will ensure the dissemination of required information at the right time. The ICT can be used as a potential tool to develop rural India. Researches in agriculture have improved production system, but these finding remain among the researchers and academicians. ICT can provide farmers all the information they need to improve production, price realization and access to latest local and global information on weather. ICT can connect small farmers and artisans living in rural areas to access price, credit facility, market rates etc. Farmers still depend on traditional approaches and recommendation of other farmers since the content is not specific to local audience, moreover they are not aware of the facilities offered by ICT and how to access them.

Developed countries have already embraced computer technology including networking and social media for communicating in agriculture. Developing countries like India are trying to increase the broadband connectivity of its villages by providing end to end connectivity through national e-governance plan .ICT are changing all spheres of human life and so it can bring about tremendous change in the

life of the farmers who adopt it. There are several models of ICTs in Indian agriculture, which have made a significant difference in the delivery of services in Indian agriculture like, the establishments of Kissan call centres, Gyandoot project, Bhoomi project, Village knowledge centres, and AGMARKNET. Kerala governments Initiative like Akshaya and e krishi are worth mentioning in this context. E-choupal program implemented in Maharashtra has also shown better results (Kumar, 2005)

2. REVIEW OF LITERATURE

Rohila, Yadav & Ghanghas (2017) paper analysed the role of ICT in providing information on agriculture technology and farmers attitude towards adopting these technologies. Author addresses the issue of agricultural extension through the application of ICT and advocates need for ICT policy and reforms. Author feels that ICT aids provide farmers with up-to- date information on the market prices of commodities and consumer trends which can improve farmer's livelihood & negotiating positions

Abraham, Ganesan & Sujatha (2014) conducted a small survey among the farmers of two Panchayats namely 'Kumarakom' and 'Aymanam' of Kottayam district, which is famous for paddy cultivation. Survey method was used to conduct the study. Various information channels are also examined and the study shows that considerable efforts in using ICT application have to be taken to provide information support for the sustainable agriculture development of the rural community.

Ajani (2014) is of the opinion that Information and communication technologies (ICTs) have the potential to reach many farmers with timely and accessible content. This article highlights the importance of ICTs in promoting agricultural transformation. ICTs can help a small-scale farmer to get relevant information regarding agro-inputs, crop production technologies, agro-processing, market support, agro-finance, and the management of farm enterprises. It recommends the establishment of agricultural communication networks, which involve active participation of all stakeholders in agriculture

The case study of Raj (2013) deals with the implementation methodology, innovations and lessons of the ICT initiative in providing agricultural extension services to the rural tribal farming community of North-East India. This study documents the ICT project implementation challenges, impact among farmers and briefly indicates lessons of the e-agriculture project.

Glendenning & Ficarelli (2012) examined the content development and management processes occurring in six well-known ICT projects in Indian agriculture. Though there are differences in scale and mechanisms of delivery and feedback, all of the case study projects use a network of experts in relevant fields to provide content, though the extent of localization varies. Author argues that to mainstream such ICT efforts in agriculture , it is necessary to put in place a centralized search engine, or harvester, to access the decentralized and dispersed digital agricultural information repositories and network of experts.

Martin & Abbott (2011) are of the view that the benefits accruing from the widespread adoption of information and communication technologies (ICTs) in developing countries include increasing people's knowledge of market information; improving the coordination of transportation, especially to successfully use mobile phones to aid development efforts, understanding the impact of the social structure on mobile phone adoption, uses, perceived impacts, and reinvention of uses is invaluable.

Qi, Wang, &Zuo (2007) focused on rural farmers' access to, interests about and management of internet information. With the perspective of farmers, this empirical study attempts to understand the potential effects of information technology on agricultural information system. The research findings indicate how the surveyed rural residents gain access to internet information and to what extent the internet as media is acceptable to farmers.

3. OBJECTIVES OF THE STUDY

The major objectives of the study are:

1. To identify the major agricultural information providers in general and ICT-based information providers in particular.
2. To assess the awareness of current agricultural support available to the farmers
3. To assess the ICT literacy among farmers.
4. To assess the use of email and internet by farmers

4. HYPOTHESES

H1: There is a no significant association between Education, Proficiency and usage of internet for agricultural information

5. METHODOLOGY

The user group under consideration consist of farmers registered to four KrishiBhavans in Nedumangad block in 2015. The farmers with landholding of more than one acre were obtained from registers maintained by Krishi Bhavan for providing agriculture incentives provided by central and state governments. Farmers with more than 1 acre registered in Krishi Bhavans in the four selected blocks are 1040. Sample size of fifteen percentages (156) of farmers is selected. A total of 170 farmers were identified and questionnaire was distributed. Of this 156(91.76%) of the farmers responded and were interviewed with the help of questionnaire.

Survey using questionnaire was resorted to collect data from user group. The questionnaire in Malayalam was designed to collect data .This was served in person and in many cases the details received through questionnaire was supplemented with personal interview for less educated farmers.

6. ANALYSIS AND RESULTS

6.1. Socio Demographic Profile

The socio demographic profile of the respondents is presented in Table.1 Age of the farmers, gender, education, occupation and other related variables were categorized for the purpose of data analysis.

Table 1. Socio demographic profile of the respondents

Category	Frequency(N=156)	Percentage
Age		
<40	**2**	1.28%
41-50	47	30.13%
51-60	60	38.5%
>60	47	30.1%
Education		
upto7th	26	16.7%
upto10th	99	63.5%
College	31	19.9%

The proportion of farmers was higher in the age group of 51- 60 years. Education wise, the respondents were grouped into three: i.e. up to 7th standard, 10th standard and college educated. Among 156 respondents majority (63.5%) passed were found to have completed 10th standard.

6.2. Agricultural Information Providers

Main agricultural information providers were assessed in the questionnare. Since most of the farmers find information by themselves, it is necessary to ascertain the sources of these information. The identified sources were neighbours , krishi bhavans, ATMA coordinators, Farm Information Bureau, TV, magazine, internet and library. Responses are tabulated in table 2.

Table 2. Agricultural Information providers

Sources	Anad	Panavoor	Aruvikkara	Karakulam	Total	Percentage
TV	36	35	30	30	131	83.97
KrishiBhavan	37	31	32	30	130	83.33
Magazine	28	19	25	20	92	58.97
Mobile Phone	22	20	17	15	74	47.44
Radio	5	9	10	5	29	18.59
Neighbours	3	6	5	0	14	8.97
Internet	2	3	4	4	13	8.33
FIB	1	3	3	5	12	7.69
ATMA	1	0	0	0	1	0.64
Library	0	0	0	0	0	0.00%

Major agriculture information providers are television (83.97 %) followed by KrishiBhavans (83.33%). Magazines emerged as the third most popular source (58.97%). Mobile phones are used by 47.44% of respondents for collecting new agricultural information. Radio as a source of information was identified by 18.59 percent of respondents. Only about 8 percent respondents depend on neighbours or internet for information. Farm information bureau was projected by 7.69 percent. Only 2 (0.64 %) were found to approach ATMA coordinators for agricultural information. None of the respondents consider Library as a source for agricultural information. It is clear from the above table that KrishiBhavans and TV act as major agricultural information providers and rural libraries do not come in the picture at all. There is no significant variation in the opinion of respondents in different blocks..

6.3. Awareness of Current Agriculture Supports Available

In order to make agricultural information available to farmers, various agricultural support mechanisms have been developed by different government institutions. Some of the relevant agricultural supports were identified for the study and included in questionnaire. These include both national and state level initiatives. Reponses provided include market price via mobile phone, AGMARKNET, Kissan call centre, ATMA, Farm Information Bureau, e-Krishi, e-choupal and KrishiVigyan Kendra. Responses are tabulated in table 3.

Table 3. Awareness of Current agriculture supports available

Agriculture supports	Anad	Panavoor	Aruvikkara	Karakulam	Total	Percentage
Kissan call centre	29	22	20	24	**95**	60.90
KrishiVigyan	22	6	20	9	**57**	36.54

Kendra						
FIB	15	10	9	5	**39**	25.00
Market price via Mobile Phone	11	2	4	2	**19**	12.18
e-krishi	4	1	1	2	**8**	5.13
ATMA	2	0	2	0	**4**	2.56
AGMARKNET	0	1	0	0	**1**	0.64

Due to wide publicity given in TV, 60.90 percent of respondents are aware of Kissan call centre. Krishi Vigyan Kendra is known to 36.54 percent, Farm Information Bureau to 25 percent, market price via mobile phone to 12.18 percent, e-Krishi to 5.13 percent, ATMA to 2.56 percent and AGMARKNET to 0.64 percent. It is clear from the table that those supports which need internet connectivity is less heard of by the farmers. Agricultural supports with more person to person interaction are more familiar to farmers. A significant variation is noted in awareness of market price via mobile phone and e-Krishi in Anad block.

6.4. ICT or E-Literacy Training

Farmers usually use traditional methods for collecting agricultural information.With the advent of modern ICT tools like computer and internet agricultural data can be easily disseminated through this channel.Usage of this sources will depend on the type and amount of training provided to them .Thus it is important to find if farmers are included in these programs . Types of training usually provided are in service training, informal training and e-literacy classes The responses are tabulated in Table 4.

Table 4.. Types of ICT training

Type of Training	**Anad**	**Panavoor**	**Aruvikkara**	**Karakulam**	**Total**	**Percentage**
In-service training	3	2	2	7	14	66.67
Informal	2	2	3	0	7	33.33
e-literacy Class	0	0	0	0	0	**0**
Total	**5**	**4**	**5**	**7**	**21**	**100.00**

Among the 156 respondents, only 21 (66.67%) have obtained any form of ICT training to use internet. Of this 21, in-service training was obtained by 14 (33.33%) farmers. Rest of them were trained informally. None of the farmers has attended any e-literacy classes. There is no significant variation in the opinion of respondents in different blocks.

6.5. Proficiency in the Use of Internet

Amount of internet usage depend on the farmer's proficiency in using internet. Respondents were asked to rate their proficiency in the use of internet as good, average, satisfactory and not proficient.

Table 5. Proficiency in the use of internet

Rate of proficiency of use of Internet	**Anad**	**Panavoor**	**Aruvikkara**	**Karakulam**	**Total**	**Percentage**
Good	2	2	1	5	**10**	6.41
Average	4	1	2	1	**8**	5.12
Satisfactory	1	1	2	1	**5**	3.21
Not proficient	33	32	35	33	**133**	85.26
Total	**40**	**36**	**40**	**40**	**156**	**100.00**

Among the 156 respondents, only about 14 percent have some kind of exposure in the use of computers and Internet with varying degrees of proficiency. Of this, only about 6 percent claim that they are good at it. The rest are kept out of the ambit of Internet. There is no significant variation in the opinion of respondents in different blocks.

6.6. Use of Internet in Getting Agricultural Information

Even though the farmers may use internet, use of internet for agricultural information may vary. Therefore, respondents were asked to rate the use of internet for agricultural information as occassionally, very little, most time not always, and all the time.Responses are given in table 6.

Table 6. Use of internet in getting agricultural information

Use of internet	Anad	Panavoor	Aruvikkara	Karakulam	Total	Percentage
All the time	0	0	1	0	1	3.33
Most time not always	0	0	1	0	1	3.33
Very little	0	2	1	2	5	16.67
Occasionally	7	3	3	10	23	76.67
Total	**7**	**5**	**6**	**12**	**30**	**100.00**

Among the 30 respondents who use internet, 76.67 percent use only 'occasionally' to collect agriculture information, 16.67 percent use 'very little' and only 3.33 percent use 'all the time' and 'most time not always' to collect agricultural information. There is no significant variation in the opinion of respondents in different blocks.

6.7. Association between Education and Proficiency and Usage of Internet for Getting Agricultural Information

This section deals with association between age, education and Proficiency and usage of internet for getting agricultural information. For this research hypothesis is formulated as H1: There is a no significant association between education and Proficiency and usage of internet for getting agricultural information Hypothesis is tested using chi square test. Details are given in the table 7.

Table 7. Data and test of significance (Chi-square test) showing association between education, Proficiency and usage of internet for getting agricultural information

Variable	Education				Chi Square	P value
Proficency	Level	**Upto7th**	**Upto10th**	**college**	44.668	0.000*
	Not proficient	25(96.2%)	92(92.9%)	14(45.2%)		
	Satisfactory	0	1(1.0%)	2(6.5%)		
	Average	1(3.8%)	3(3.0%)	11(35.5%)		
	Good	0	3(3.0%)	4(12.9%)		
Usage	**Nil**	25(96.2%)	91(91.9%)	16(51.6%)	36.158	0.000*
	Very little	1(3.8%)	7(7.1%)	9(29.0%)		
	occasionally	0	1(1.0%)	5(16.1%)		
	Most time	0	0	1(3.2%)		

*ns: not significant(P>0.05), *: significant(P<0.05).*

From Table 7, it is observed that there exists statistically significant association between education, Proficiency (Chi-square=44.668, P=0.000<0.05) and usage of internet for agricultural information (Chi-square=36.158, P=0.000<0.05). So the hypothesis H1 is rejected.

7. Major Findings of the Study

Major finds of the study are

a) Television and KrishiBhavans were identified as the major information provides. Only a minority identified neighbours, Internet, farm information bureau and ATMA as information providers. None identified Library as a source of agricultural information
b) More than half of the farmers were aware of agricultural supports like Kissan Call centres. most of them are not aware of e-krishi, ATMA, Agmarknet, farm information bureau or market price via Mobile phones
c) Only a few farmers have received ICT training as a part of their in- service training. Most of them are not proficient in using internet and also do not have e-mail or access to social networking sites. Only a few use internet to collect agricultural information and all of them access the Net from their home.
d) There exits statistically significant association between education, Proficiency and usage of internet among farmers.

8. CONCLUSION

The main objective of the study was to make a comprehensive study of the awareness and use of ICT for agricultural activities among farmers. There is an imbalance between the rapidly developing technologies and information available. Moreover, the farmers still depend on traditional ICT tools and less aware of agricultural supports available through modern tools like internet. These new tools can have an impact in agricultural only if farmers know what are their availability, how to access them and reliability of information available through them. KrishiBhavans can play a major role in imparting these ICT skills to farmers . Rural libraries have a potential to act as information centres for farmers but have not yet realized their potential. The study provides valuable insights on the type of media most trusted and used by the farmers, the type of information sought by them and the lacunae existing in the present set up.

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