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AN ANALYSIS OF KNOWLEDGE LEVEL OF FARMERS ON UTILISATION OF ICT TOOLS FOR FARM COMMUNICATION

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ABSTRACT

The study was conducted in Karnataka State during 2011 to assess the knowledge level of farmers towards utilisation of ICT tools in farm communication and to find out the relationship with socio-economic characteristics of farmers using these tools. Bangalore rural, Chikkaballapura and Kolar districts were selected purposefully because these districts are nearer to Bangalore which is the hub of IT and most of farmers of these three districts are receiving Multi Message Services (MMS). The respondents selected for the study include 120 farmers from 12 villages of three districts. The findings of the study revealed that nearly 70 per cent of farmers had high to medium level of knowledge about utilisation of ICT tools and 30.83 per cent had low level of knowledge about ICT tools. Variables such as material possession, social participation, extension participation, mass media exposure and cosmopoliteness had positive and significant relationship with knowledge of farmers about ICT tools at one per cent level of significance whereas; education and annual income had positive and significant relationship at five per cent level of significance. As the study revealed, most of the farmers had knowledge about the utility of ICT tools for farm communication, only limitation is the availability. The arrangement for availability of ICT tools could make huge difference in the agriculture sector of the country.

Introduction

Information Communication Technology (ICT) is a term which is currently used to denote a wide range of services, applications and technologies, using various types of equipment and software. ICT tools are emerging as an important tool for the economic development of the country. The ICTs are no more confined to the research and development, instead the tools are being extensively used for extension services all over the world. The services that ICT tools could offer have made significant impact on the economic development of the country like India being the world's fastest growing economy. One of the major advantages of using ICT tools for farm communication is the efficiency which has gone very high in the recent days. New businesses like Banking and Insurance, the entertainment industry and other industries and organisations, are all taking maximum advantage of the ICT.

India has not lagged behind in use of ICT to provide required information to the farmers. A beginning was made in the use of ICT with

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the designing of Financial Accounting Information System in 1971 by Jute Corporation of India (Quasi sector) covering seven States viz., Andhra Pradesh, Assam, Bihar, Meghalaya, Odisha, Tripura and West Bengal. Later many projects like Information village centre, Gyanadoot project, e-choupal, e-grama etc., came into existence. Information village centre project started by M.S. Swaminathan Research Foundation in 1998 covered 12 villages in Pondicherry region serving rural families, particularly marginal farmers, fishermen and assetless. Gyanadoot is a community-owned, self-sustainable and low cost rural intranet project, initiated on 1 January, 2000, at Dhar district. Eleven centres were started on a pilot basis and they were called *'soochanalayas'* (information kiosks), which provided user-charge-based services to the rural people. Warana wired project, started by NIC (National informatics centre) and Maharashtra Government covers 70 villages in Kolhapur and Sangli districts. Ten public service centres have been induced to facilitate sugarcane procurement and to provide market information.

Lex (1995) observed that modernisation of agriculture will be greatly influenced by new gadgets like CD-ROM, internet etc., specially by integrating information systems in a single tool which can be used in the same way as any other farm input.

Richardson (1997) reported that in Bangladesh, ICT have transformed the lives of rural people and village women. Women have started small-scale enterprises through small loans from the grameen bank to buy mobile cell phone that have been used to provide telephone services and earn them good income. Much of the voice traffic over the cell phones is commerce directed-access to agricultural market prices, access to agricultural trade information, facilitation of remittances from foreign workers, information on work opportunities using the phone to reduce substantial travel costs.

For more than a decade, information and communication technologies (ICT) have been attributed a key role in both economic growth and poverty reduction. They increase efficiency, provide access to new markets or services, create new opportunities for income generation and give poor people a voice. In spite of continous efforts of various functionaries, there are still areas where improvement is needed to be able to take advantage of the benefits of ICT. Many of the farmers may depend on extension personnel to get information on cultivation practice. However, the ICT will serve complementary to the services that an extension worker could provide and it is gaining momentum. The various types of information that the ICT tools can provide includes, information related to different schemes, crops, technologies, seeds, fertilisers, pesticides, availability of fertilisers, seedlings, bio-pesticides, soil fertility, pest and disease diagnosis, the agricultural marketing information, weather forecasting helps the farmers to take right decision at right time. Tavernier et al (1996) felt that information communication technologies are offering new ways for extension personnel to reach wider audience.

Internet plays a vital role in exchanging information through e-mail, chat etc. Farmers can get the improved information services through creative use of information technology. In a developed country like USA, most of the big farmers are using internet to get information, to communicate and for buying inputs or selling outputs. The past decade has witnessed a revolution in the use of ICT in developing countries. Many people and offices as well as rural farmers own ICT facilities such as personal computers and mobile phones. The largest increases in the use of ICT has been in mobile telephony where subscriptions in developing countries increased from about 30 per cent of the world total in 2000 to more than 50 per cent in 2004 and to almost 70 per cent in 2007, while internet use has not increased as rapidly as mobile communication.

The newly developed Information and Communication Technology (ICT) is a vital tool to form a bridge between the information society and the knowledge society, and has supported a quiet revolution in education over the past decades.The use of distance learning is a primary example of ICT in education. As a communication measure, internet technology played a great role in facilitating interaction between teaching and learning. One of the studies conducted by Bell et al (2004) reveals that in both rural and urban areas, middle and upper income people are more likely to use ICTs. What really matters is availability of ICT tools to the farmers. The policy makers should take up issues which need some serious concern for the development of the agrarian community, encompassing a lack of opportunity, empowerment and security. ICT access can have powerful impact in addressing these constraints (OECD, 2007).

Bhatnagar and Vyas (2001) are of the opinion that introducing ICT in poor rural areas can be a catalyst for change. However, some pre-requisites are needed to make this introduction cost-effective and sustainable, such as stable electric and software. If these essential factors are not present, it may be better to search for more appropriate and low-tech solutions. In the case of Gyanadoot, for instance, why not use the radio- which is cost-effective and has a very large reach in rural areas-to inform farmers about prices of agricultural commodities.

The strong linkage complimented by flawless information flow enhanced by the effective use of ICT by the extension services will significantly boost agricultural production and improve rural livelihoods in developing countries. Front line extension workers, who are the direct link between farmer and other actors in the agricultural knowledge and information system, are well positioned to make use of ICT to access expert knowledge or other types of information that could facilitate the accomplishment of their day-to-day activities. Knowledge sharing, exchanging and dissemination are elements in a broader theme which is knowledge management.The central purpose of knowledge management is to transform information and intellectual assets into enduring value. With this background, the study was undertaken to know the knowledge level of farmers about ICT tools utilisation for farm communication and relationship between knowledge of farmers about ICT tools and their socio-economic characteristics.

Methodology

The study was conducted using "Ex-post-facto" research design in Bangalore rural, Chikkaballapura and Kolar districts of Karnataka State during 2011.These districts were selected purposefully because; these are nearer to Bangalore which is known as the hub of IT. Many farmers of these three districts are getting Multi-Message Services (MMS) and also they are using other ICT tools. Doddaballapurar, Chintamani and Srinivasapura taluks were selected from Bangalore rural, Chikkaballapura and Kolar districts, respectively. From each taluk four villages were selected which are nearer to the respective KVKs. The villages selected for the study were Hadonahalli, Tapsahalli, Gejjegaranahalli and Lakshmidevapura from Doddaballapura taluk, Kurtahalli, Muniganahalli, Kallahalli and Kachalli from Chintamani taluk and Shettihalli, Chowdanalli, Dosandra and Vardanahalli from Srinivasapura taluk. In each of the selected villages, initially a list of 25 farmers was prepared based on the farmers getting multi-message services, attended video conference programmes and using one or more ICT tools in getting farm information. From this list 10 farmers were selected randomly from each village, which constituted a sample of 120 respondents for the study.

The statements for knowledge measurement were developed based on review of literature, in consultation with

specialists in the field of ICT in agriculture, field extension personnel and farmers utilising the ICT tools for communication of farm information. The procedure followed by Narayana Swamy (1994) was used to measure the knowledge level of farmers about ICT tools. The statements were further pretested for reliability and validity to obtain comprehensive responses from the respondents. The items which had difficulty index ranging from 20-80 per cent and the discrimination index ranging from 0.20 to 0.80 were selected for measuring the knowledge level of the respondents. Based on consultation with different sources as mentioned above, seventeen statements were developed and used for collecting the data.

Results and Discussion

Knowledge Level of the Respondents About ICT Tools : The results of the study indicated that (Table 1) almost 70 per cent of the respondents had medium and high level of knowledge. The present epoch of globalisation and liberalisation has brought in the competitiveness in agriculture production through adoption of improved technologies by the farmers. A considerable percentage of the respondents knew that it is possible to get timely information through ICT tools, specially information needed at critical stages of production and marketing information.

Table 1 : Overall Knowledge of the Respondents About ICT Tools

(N=120)

Category	Score	Frequency	Per cent
Low	<11.14	37	30.83
Medium	11.14-15.85	42	35.00
High	>15.85	41	34.17
	Total	**120**	**100.00**

Table 2 presents data regarding knowledge of farmers about services that individual ICT tool can offer. Predominant number (85 per cent) of the respondents knew that TV provides information regarding agriculture. The television has become an integral part of rural India. Most of the farmers have knowledge that the TV is one of the sources of agriculture information because TV medium has grown to such an extent that most of the farm families have TV in their house. It can be said that, a house without a television in rural areas is hardly seen. Communication of farm information through television will be the most prioritised source of communication. As indicated in this particular study, it is possible to reach more number of farmers in the shortest possible time with television as an extension tool.

More than three-fourths (80 per cent) of respondents knew that mobile provides agricultural information. A source says that mobile has become a basic requirement in all the spheres of life. Data like market information, weather forecasting and emergency situations like flood, drought and weather extremities can be quickly communicated to farmers through mobile. Since most of the farmers are aware of farm communication through mobiles it will be a supreme choice for the extension functionaries. The study reveals that 41.67 per cent of the respondents knew that agricultural information can be obtained through telephone. The Kissan Call Centre (KCC) is making some difference in the farming community by one of the sources that a farmer can easily access. However, there is a need to equip this sector further.

Table 2 : Statement-wise Analysis of Knowledge of Farmers About ICT Tools

(N=120)

S. No.	Statements	Know		Don't know	
		No.	%	No.	%
1	Television provides multimedia agricultural information	102	85.00	18	15.00
2	Mobile provides agricultural information	96	80.00	24	20.00
3	Radio provides agricultural information	40	33.33	80	66.67
4	Internet provides agricultural information	4	3.33	116	96.67
5	Video conference provides agricultural information	50	41.67	70	58.33
6	DVDs/CDs provide agricultural information	28	23.33	92	76.67
7	Telephone provides agricultural information	50	41.67	70	58.33
8	Video conferencing is a two-way communication	50	41.67	70	58.33
9	DVD's/CD's / documentaries provide detailed information with audio and video	28	23.33	92	76.67
10	ICT tools provide retrievable information	28	23.33	92	76.67
11	ICT tools provide information regarding crop production, protection, post-harvest technologies and other allied activities	92	76.67	28	23.33
12	ICT tools provide marketing and storage information of agriculture	92	76.67	28	23.33
13	ICT is the quick mode of communication	92	76.67	28	23.33
14	ICT provides weather information	68	56.67	52	43.33
15	ICT tools provide information on crop insurance and other government programmes	67	55.83	53	44.17
16	ICT tools are user-friendly	65	54.17	55	45.83
17	To use ICT tools minimum knowledge is required	82	68.33	38	31.67

It is observed that many (66.67 per cent) of the respondents did not know that agricultural information is broadcast through radio. Farm communication through radio is hardly known to 30 per cent of the respondents. The cost and maintenance of radio equipment is simple and of low cost. Further, one of the important observations made during the study was, majority (96.75 per cent) of the respondents did not know about internet and its utility. Internet plays an important role as it is possible to get multimedia information which includes text, photograph and video and many more. The services a farmer can get from internet includes weather related information, plant disease related information, pests related to different crops, arrivals and pricing in different markets around the country . It is appropriate to remember that Warren and Stone (1999) indicated that internet was used for commercial farming than subsistence farming in England. Internet has not reached the rural India as expected hence, it is necessary to educate farmers regarding the usage of internet for agriculture information.

The results of the study show that 58.33 per cent of respondents did not know that video conferencing provides agricultural information and 41.67 per cent of respondents knew about it. It is one of the new techniques emerging in recent days and it is yet to gain momentum. The farmers can see the expert, talk and exchange information with them. Video conferencing has the potential of covering all aspects of agriculture, natural resource, and food system, enable farmers to locate needed information to improve yields, plan for weather contingencies, access research, calculate treatments and runoff, stimulate the growing season, visualise precision data, and manage finances, buy inputs and sell outputs, and monitor prices in local as well as world markets. Of course, much remains to be done to ensure that farmers worldwide can access and locate reliable web resources.

More than half (58.33 per cent) of the respondents did not know that video conferencing is a two-way communication and 41.67 per cent of the respondents knew about it. Since video conferencing in agriculture is in infant stage having great potentiality of growth, most of the farmers do not know video conferencing as a method of farm communication.

A great majority (76.66 per cent) of respondents did not know that DVD's/CD's/ documentaries provide detailed information along with audio and video and 23.33 per cent of the respondents knew about it. The DVD/CD method of farm communication has great scope since about two-thirds farmers knew that information can be obtained through them. A large number (76.67 per cent) of respondents did not know that ICT tools provide retrievable information and about 23.33 per cent of the respondents knew the reality. The ICT tools like Internet, KIOSK have the potentiality of providing the retrievable information as many of the farmers knew that it can be exploited for providing information to farmers.

Majority (76.67 per cent) of the respondents knew that ICT tools provide information regarding crop production, protection, post-harvest technologies and other allied activities and 23.33 per cent of the respondents did not know. More than three-fourths (76.67 per cent) of the respondents knew that ICT tools provide marketing and storage information of agriculture and 23.33 per cent of the respondents did not know about it. There are website, online information portals, mobile services and TV news through which farmers can get hold of marketing information in view of the fact the ICT tools are well known to the farmers for their marketing information.

Majority (76.6 per cent) of the respondents knew that ICT is the quick mode of communication and 23.33 per cent of the respondents did not know. The high-speed

information transport is one of the proven advantages of the ICT tools, hence most of the farmers feel that ICT is a quick mode of communication. More than half (56.67 per cent) of the respondents knew that ICT provides weather information and 43.33 per cent of the respondents did not know about it. Some of the farmers are receiving weather information through mobile, internet and through phone also.

More than half (55.83 per cent) of the respondents knew that ICT tools provide information on crop insurance and other government programmes and 44.17 per cent of the respondents did not know. Nearly, half of the respondents have the knowledge about the fact. This particular advantage of the ICT tool is yet to get familiarised in the farming community. Considerable percentage (54.17) of the respondents knew that ICT tools are user - friendly and 45.83 per cent of the respondents did not know. ICT tools require a general knowledge of operating it and it is not at all necessary to be a specialist in using them. Nearly half of the respondents had the knowledge,

Relationship Between Personal, Socio-economic,Psychological Characteristics of the Farmers and Their Knowledge About ICT Tools : The relationship between personal, socio-economic and psychological characteristics of the farmers and their knowledge about ICT tools is depicted in Table 3. It could be observed from the Table that the variables such as material possession, social participation, extension participation, mass media exposure and cosmopoliteness had positive and significant relationship with knowledge of farmers at one per cent level of significance whereas, education and income had positive and significant relationship with knowledge of farmers at five per cent level of significance.

The social participation, extension participation and mass media exposure have significant relationship with the farmers since these things will expose farmers to different sources of information where farmers start learning about the ICT tools and techniques. Farmers who have invested more on the purchase of agricultural implements, TV, radio, communication gadgets, inputs and machineries will efficiently utilise them in the field regularly which necessitates them to know or acquire more about the ICT tools.

Participation in different extension programmes can expose them to ICT tools used by extension personnel for communication which will lead to higher level of knowledge among farmers. Advent of mass media provides enormous opportunities for repeated exposure of farmers to new technology and motivating them to action. Further, few of the ICT tools are part of the mass media used by the farmers. A farmer who has more mass media exposure becomes innovative, develops risk taking ability, motivation and high aspiration and will try to know more about the existing things and acquire more knowledge on ICT tools. It is believed that the more farmers visit nearest city or town, more will be the exposure to ICT tools and also they can get knowledge from their friends, input dealers and officials about ICT tools.

Conclusion

Agriculture information resources should be significantly organised and processed to disseminate right information to the right user at the right time. The study revealed that nearly 70 per cent of the respondents had medium to high level of knowledge about ICT tools. This means extension through ICT tools could be a feasible option for the extension service providers. Most of the farmers depended on TV and mobile for getting wide range of information because of its accessibility. Dissemination of information like marketing information, package of practices through mobile and the television could create a positive impact on the production system of the country.

The major challenges inhibiting the use of ICT in disseminating agricultural knowledge

Table 3 : Correlation Between the Selected Personal, Socio-economic and Psychological Characteristics of the Respondents and Their Knowledge About ICT Tools

(N=120)

S.No.	Variables	Correlation co-efficient
1	Age	0.014 NS
2	Education	0.246*
3	Landholding	0.076 NS
4	Family type	0.053 NS
5	Farming experience	0.042 NS
6	Material possession	0.257**
7	Annual income	0.352*
8	Innovativeness	0.008 NS
9	Social participation	0.282**
10	Extension participation	0.324**
11	Mass media exposure	0.253**
12	Economic motivation	0.062 NS
13	Risk orientation	0.091 NS
14	Scientific orientation	0.084 NS
15	Cosmopoliteness	0.351**

** - Significant at 0.01 level. * - Significant at 0.05 level. NS- Non-Significant

and information are the low level of access to ICT infrastructure and services which need to be addressed. The existing potential for extending the current ICT infrastructure to reach rural farmers, coupled by the presence of wide area radio service coverage across the country, should be exploited to implement ICT-based knowledge and information dissemination in the short-term. Government and its partners should consider policy and investment priorities in order to promote cost-effective knowledge management in agriculture.

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