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Awareness of ICT usage by extension personnel: Knowledge and purpose

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Abstract

Information and communication technologies (ICT) is defined as a diverse set of technological tools and resources used to transmit, store, create, share or exchange information. ICT is an emerging centre in agriculture to enhance agriculture and rural development in India. Progress in ICT is meant to provide the farmers with appropriate knowledge and services related to agriculture. Thus, in this time of information revolution, agricultural extension scientists should be encouraged to use ICT so that efficiency and effectiveness of information communication system could be increased. Keeping all this in mind a study was conducted to investigate the knowledge and the basic purpose of utilization of ICT by extension personnel at KVK's in Haryana. Given the urgent need for current agricultural knowledge and information system (AKIS) to farmers, the use of conventional communication channels such as farm/home visit, personal letters, and use of contact farmers, for disseminating agricultural information is counterproductive. This calls for the adoption of Information and Communication Technologies (ICTs) by both researchers and extension workers to transmit relevant information to farmers in a most efficient way. The socio-demographic profile of extension personnel from all the KVKs of Haryana state revealed that majority of the respondents (56.2%) belonged to the age group of 29-40 years, were males (75.0%), Subject Matter Specialists (78.7%), had a service experience of 1-5 years (37.5%), majority of the respondents were PhD with NET (97.5%) and were from the discipline of agronomy (25.0%). Cent per cent of extension personnel had availability of ICT with them. Majority of the respondents (90.0%) had basic purpose of utilization of ICT as gaining/updating knowledge and printing/ publication (printed online), cent per cent of extension personnel had knowledge regarding ICTs improve communication process and coordination among KVKs, research institutes and SAUs followed by the role of ICT in agriculture knowledge management (98.7%). Index showed that 81.8% of the extension personnel had knowledge regarding information communication technology.

Keywords: Extension personnel, Information communication technology (ICT), Krishi Vigyan Kendra (KVK)

Introduction

Information and communication technologies are the combination of hardware, software, and production tools that permit the sharing, processing, and administration of information and knowledge, (Academy for Educational Development and Winrock International in 2003). Increasing the productivity and standard of living for rural farmers and their families is the goal of agricultural extension in developing nations like India. The sharing and exchange of information, knowledge, and skills is a crucial component of extension. Extension is fundamentally communication, a process that links and exchanges information between many parties, which is a prerequisite for sustainable development. ICT in agriculture provides a variety of answers to some agricultural problems. It is regarded as a developing field that focuses on enhancing rural and agricultural development through better information and communication systems.

The effective use of ICT greatly increase agricultural production and enhance rural livelihoods in developing nations. Front-line extension workers, who serve as the direct conduit between farmers and other actors in the agricultural knowledge and information system, are in a good position to use ICT to gain access to specialised knowledge or other types of information that may make it easier for them to carry out their regular tasks (Adedoyin, 2005) [1]. ICT can help extension agents do their jobs more quickly and effectively while also facilitating information dissemination and post-extension services.

Agriculture extension has been in the forefront of providing farmers with sufficient knowledge to boost output. The extension of research findings and improved agricultural practises to farmers is the focus of agricultural extension service delivery globally (Danso *et al.* 2018) [2]. The effectiveness with which this knowledge and these practises are disseminated to farmers greatly influences the level of agricultural productivity. Imagine a scenario where cutting-edge technology is used to assist in every phase of producing crops, from the selection of high-quality seeds to crop threshing. All that is required is that we utilise ICT resources and integrate them with agriculture productivity, hence improving the quality and quantity of crops in India. The goal is to create ICT-based solutions that are affordable. Keeping in mind the enormous scope of ICT application in

agriculture the entire study was undertaken with the objective of investigating knowledge of extension personnel regarding ICT and basic purpose behind the utilization of ICT among extension personnel.

Methodology

The study was conducted at all the Krishi Vigyan Kendra's of Haryana state. Nineteen districts where KVK of CCSHAU are located were selected purposively. Total sample constituted 80 extension personnel from all the available discipline of the KVKs.

Socio-demographic profile of the extension personnel working at KVK, Haryana

Table 1 indicated the socio-demographic profile of respondents from all the KVKs of Haryana state. Out of the 80 respondents, majority of the respondents (56.2%) belonged to the age groups of 29-40 years followed by (23.7%) in the age group of 51-60 years and fewest (20.0%) of the respondents were in the age group of 41-50 years, Majority of the respondents from KVKs were males (75.0%) and 25.0% respondents were females, 78.7 per cent of the respondents from KVKs were Subject Matter Specialists followed by 11.2 per cent were Agriculture Assistants and 10.0 percent were Agriculture Extension Officers/ Senior coordinator. Majority of respondents from KVKs had a service experience of 1-5 years (37.5%), followed by 23.7 percent with an experience of 6-10 years, 20.0 percent with more than 15 years of experience and 18.75 percent between 11-15 years of experience.

Table 1 indicated that majority of the respondents had monthly income more than Rs 7,00,000 (75.0%) followed by 22.5 percent had monthly income between Rs 4,00,000 – 6,00,000/- and only 2.5 percent had monthly income between Rs 1,00,000 - 3,00,000/-, 50.0 per cent of the respondents from KVKs had nuclear family and an equal number of respondents had joint family each respectively. Majority of the respondents were PhD with NET (97.5%) and only 2.5 percent respondents were M. Sc. with NET,

Majority of the respondents had medium family education status (48.7%) followed by 27.5 percent with low family education status and 23.7 percent had high family education status,

Majority of the respondents were in service (71.2%) followed by 18.7 percent had farming as their family occupation and only 10.0 percent had business in their family.

Table 1 further revealed that majority of the respondents had power supply for more than 18 hours (68.7%) per day followed by 17.5 percent had power supply for 13-18 hours per day, 7.5% respondents for 5-8 hours per day and 6.25% had power supply for 9-12 hours per day.

Majority of the extension personnel of KVKs were from the discipline of agronomy (25.0%) followed by 21.25 percent from extension education, 18.75 percent from home science and 10.0 percent from soil science, 5.0 percent from horticulture, engineering, Plant pathology and economics each respectively and only 1.25 percent were from plant breeding and zoology each respectively. Majority of the respondents (66.2%) had to travel 2-5 km distance from city or town to KVK followed by 12.5 percent had to travel 6-10 km and more than 20 km distance from city or town and only 8.75 percent had to travel 10-20 km distance from city or town to KVK.

Table 1: Socio demographic profile of the extension personnel at KVKs n = 80

Sr. No.	Variable	Frequency	Percentage (%)
1.	**Age**		
	29-40 years	45	56.2
	41-50 years	16	20.0
	51-60 years	19	23.7
2.	**Gender**		
	Male	60	75.0
	Female	20	25.0
3.	**Post Held**		
	Subject Matter Specialist	63	78.7
	Agriculture Extension Officer/ coordinator	8	10.0
	Agriculture Assistant	9	11.2
4.	**Service experience**		
	1-5years	30	37.5
	6-10 years	19	23.7
	11-15 years	15	18.7
	More than 15 years	16	20.0
5.	**Family income per month (in Rs.)**		
	1,00,000 to 3,00,000	2	2.5
	4,00,000 to 6,00,000	18	22.5
	More than 7,00,000	60	75.0
6.	**Family type**		
	Nuclear Family	40	50.0
	Joint Family	40	50.0
7.	**Education**		
	MSc with NET	2	2.5
	PhD with NET	78	97.5
8.	**Family Education Status**		
	Low	11	27.5
	Medium	14	48.7
	High	18	23.7
9.	**Occupation of Family**		
	Farming	15	18.75
	Business	8	10
	Service	57	71.25
10.	**Hours of Power Supply**		
	5-8 hours per day	6	7.5
	9-12 hours per day	5	6.25
	13-18 hours per day	14	17.5
	More than 18 hours	55	68.75
11.	**Discipline of Extension Personnel**		
	Extension Education	17	21.25
	Home science	15	18.75
	Agronomy	20	25
	Soil Science	8	10
	Horticulture	4	5
	Plant Breeding	1	1.25
	Engineering	4	5
	Plant Pathology	4	5
	Zoology	1	1.25
	Economics	4	5
	Entomology	2	2.5
12.	**Distance from City or Town**		
	2-5 km	53	66.25
	6-10 km	10	12.5
	10-20 km	7	8.75
	More than 20 km	10	12.5

Table 2: Basic purpose behind the utilization of Information and Communication Technology (ICT) among extension personnel of KVK

Table 2 proffered the data regarding basic purpose behind the utilization of Information of communication technology among extension personnel of KVK. Cent per cent of extension personnel had availability of ICT with them. Majority of the respondents (90.0%) had basic purpose of gaining/updating knowledge and printing/ publication (printed online) followed by making presentation/preparing media (88.7%), sending and receiving emails, weather information, seminar/ training/ meeting, planning for exhibition / kisan mela /campaigns, teaching/ data analysis, report writing/typing and communication with farmers (85.0%, 81.2%, 76.2%,70.0%, 68.7%, 67.5% and 66.2%) each respectively for utilization of ICT.

The data further depicted that utilization of modems/routers / Wi -Fi was 62.5 per cent, computer information retrieval (57.5%), chatting/ sending message to farmers and colleagues (55.0%), research information/ data analysis and searching new technology for farmers (52.5%), finding reference 51.2 per cent whereas less than half or near to half were utilizing memory card/ data storage/ hard disk (40.0%), cyber extension (45.0%), entertainment/ infotainment (36.2%), production of videos/reels (25.0%), market information (22.5%) and service provider mobile based extension (21.2%).

Table 2: Availability and basic purpose behind the utilization of ICT among extension personnel of KVK n= 80

Sr. no.	Availability of ICT tools by extension personnel	Frequency	Percentage (%)
I	Availability	80	100.0
II	Basic purpose behind the utilization of ICT tools	Frequency	Percentage (%)
1.	Computer Information retrieval or data updating	46	57.5
2.	Research information/ Data analysis	42	52.5
3.	For finding reference	41	51.2
4.	Sending and receiving emails	68	85.0
5.	Making Presentation / Preparing media	71	88.7
6.	Seminar/ training / meeting	61	76.2
7.	Communication with farmers	53	66.2
8.	Printing / publication (printed online)	72	90.0
9.	Weather information	65	81.2
10.	Report writing/ typing	54	67.5
11.	Chatting / sending message to colleagues	44	55.0
12.	Teaching / Data analysis	55	68.7
13.	Memory card/ Data storage / Hard disk	32	40.0
14.	Modems/ routers /Wi-Fi	50	62.5
15.	Service provider mobile based extension	17	21.2
16.	Gaining / updating knowledge	72	90.0
17.	Entertainment / infotainment	29	36.2
18.	Market information	18	22.5
19.	Cyber extension	36	45.0
20.	Production of videos/reels	20	25.0
21.	Searching new technology for farmers	42	52.5
22.	Organization plan for exhibition/ kisan mela/campaigns	56	70.0

Table 3: Knowledge of extension personnel for information and communication technology

Table 3 analyzed the knowledge of extension personnel for ICT. The data interpreted that the ICT has a role in improving communication process and coordination among KVKs, research institutes and SAUs as highest with mean score (2.0, rank-I) followed by the role of ICT in agriculture knowledge management with mean score (1.98, rank – II), mobile is a very useful technology for connecting with farmers and experts and the usage of ICTs reduces the workload of KVK staff and enhanced the productivity of scientists with (MS-1.97, rank-III), ICT usage helped in building knowledge sharing channel between extension personnel and farmers with (MS-1.96, rank-IV), video, website, apps, youtube, portals etc. the best method for educating farmers on improved practices and technologies with (MS-1.93, rank – V).

Table 3: Knowledge of extension personnel for information and communication technology n = 80

Sr. no	Knowledge	Yes		NO		Mean Score	Rank
		f	%	f	%		
1.	Do you know ICTs has a role in improving communication process and coordination among KVKs, research institutes and SAUs	80	100	-	-	2.00	I
2.	Can internet be a good source for collecting the current information on every aspect of agriculture	70	87.5	10	12.50	1.87	VIII
3.	Do you know that the use of ICT makes extension activities like training, demonstration, field day, Kisan Mela, campaign etc. more effective.	45	56.2	35	43.7	1.55	XVI
4.	Are video, website, apps, youtube, portals etc. the best method for educating farmers on improved practices and technologies	75	93.7	5	6.25	1.93	V
5.	Do you know that mobile is a very useful technology for connecting with farmers and experts	78	97.5	2	2.50	1.97	III
6.	ICT applications and tools save time, cover the masses in short period and reduces the barriers	65	81.2	15	18.75	1.81	XII
7.	ICTs like multimedia, video, power point can be used to create a constructive and interesting learning environment and instructional material	65	81.2	15	18.75	1.81	XII
8.	Dose the usage of ICTs reduce the workload of KVK staff and enhanced the productivity of scientists	78	97.5	2	2.50	1.97	III
9.	Do you find ICTs utilization suitable for extension activities in rural areas	66	82.5	14	17.50	1.82	XI
10.	Do you know that Increased use of ICT leads to physical health issues	68	86.2	16	13.75	1.09	XIX
11.	Can ICTs usage helpful in building good rapport between extension personnel and farmers	39	48.7	41	51.25	1.48	XVIII
12	Are ICTs effective when there is proper management and set up of ICTs tools	69	86.2	11	13.75	1.86	IX
13.	Do you know from ICTs we can get instant feedback about training	71	88.7	9	11.25	1.88	VII
14.	Is it difficult to use ICT application with no proper accessibility of Wi-Fi/internet in rural areas.	55	68.7	25	31.25	1.68	XIII
15.	Is there no sufficient power supply in rural areas to use ICTs	54	67.5	24	32.5	1.65	XIV
16.	Wrong perception of farmer for ICTs decline the use of ICTs by extension personnel	41	51.2	39	48.75	1.51	XVII
17.	Farmer resist adoption of e- practices in agriculture and wants to continue traditional methods.	49	61.2	31	38.75	1.61	XV
18.	Regular updating of KVK extension personnel regarding ICT innovations make them more functional.	72	90	8	10	1.90	VI
19.	Do you use ICT for dissemination of information about weather / soil/ irrigation / bank loan / market price to farmers	68	85	12	15	1.85	X
20.	Do you have ever used Youtube / google meet / zoom platforms for training of farmers	73	91.2	7	8.75	0.54	XX
21.	Does ICT fill the gap between lab and land.	69	86.2	11	13.75	1.86	IX
22.	Do you know the role of ICT in agriculture knowledge management.	79	98.7	1	1.25	1.98	II
23.	Can ICT usage helped in building knowledge sharing channel between extension personnel and farmers.	77	96.2	3	3.75	1.96	IV
	Total	1506		335		39.5	

Furthermore the data revealed that regular updating of KVK extension personnel regarding ICT innovations makes them more functional with (MS-1.90, rank- VI) followed by ICTs helped to get instant feedback about trainings with (MS-1.88, rank-VII), Internet be a good source for collecting the current information on every aspect of agriculture with (MS-1.87, rank- VIII), ICTs effective when there is proper management and set up of ICTs tools and ICT fill the gap between lab and land with (MS-1.86, rank – IX), usage of ICT for dissemination of information about weather / soil/ irrigation / bank loan / market price to farmers (MS-1.85, rank – X), ICTs utilization suitable for extension activities in rural areas with (MS-1.82, rank-XI) and ICT applications and tools save time, cover the masses in short period and reduces the barriers and ICTs like multimedia, video, power point could be used to create a constructive and interesting learning environment and instructional material with (MS-1.81, rank-XII), is it difficult to use ICT application with no proper accessibility of Wi-Fi/internet in rural areas, it is difficult to use ICT application with (MS-1.68, rank-XIII), is there no sufficient power supply in rural areas to use ICTs with (MS-1.65, rank XIV), farmer resist adoption of e-practices in agriculture and wants to continue traditional methods with (MS-1.61, rank- XV), the usage of ICTs makes extension activities like training, demonstration, field day, kisan mela, campaign etc. more effective with (MS-1.55, rank- XVI), wrong perception of farmers for ICTs decline the use of ICTs by extension personnel and with (MS-1.51, rank- XVII), ICTs usage helpful in building good rapport between extension personal and farmers with (MS-1.48, rank – XVIII), increased use of ICT leads to physical health issues with (MS-1.09, rank-XIX) and knowledge of extension personnel about usage of youtube / google meet / zoom platforms for training of farmers with (MS- 0.54, rank-XX).

Knowledge Index

Knowledge index of extension personnel regarding ICT was found by taking in to account sum total of the questions replied correctly i.e (1506) divided by total number of questions asked (23) and multiplied by total number of respondents (80) which came out to be (1840) and further multiplied by hundred to calculate the knowledge index in per cent which was (81.8%).

$$\text{Knowledge Index} = \frac{\text{Total number of questions correctly replied}}{\text{Total number of questions asked * total number of respondents}} \times 100$$

$$\text{Knowledge index} = \frac{1506}{23 \times 80} \times 100 = \mathbf{81.8\ \%}$$

Index showed that 81.8% of the extension personnel had knowledge regarding information communication technology.

Conclusion

The general conclusion from this study was that the knowledge of extension personnel for Information and Communication Technologies (ICT) tools was higher. Cent per cent of extension personnel had availability of ICT with

them. The basic purpose behind utilization of ICT was gaining/updating knowledge and printing/ publication (printed online) followed by making presentation/preparing media. ICT improves communication process and coordination among KVKs, research institutes and SAUs and the role of ICT in agriculture knowledge management was well realised by the extension personnel hence its usage be more encouraged so that farmers will be well updated with the new development in agriculture.

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