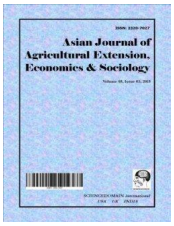

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Knowledge of Agriculture Extension Functionaries Regarding Information and Communication Technology Tools

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Authors' contributions

This work was carried out in collaboration between both authors. Author DJJ designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author MTL managed the analyses of the study. Both authors read and approved the final manuscript.

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ABSTRACT

The present study was conducted during 2016-17 to assess the knowledge of agriculture extension functionaries regarding Information and Communication Technology (ICT) tools. Eighty Agriculture officers and Assistant Agriculture officers were interviewed from 43 Raitha Samparka Kendras in four Southern districts of Karnataka state of India. Data was collected from the agriculture extension functionaries during the bimonthly meetings held in the District Agricultural Training Centres (DATCs) of the respective districts. The collected data was scored, tabulated and analysed using frequency, percentage, standard deviation, chi-square test and multiple regression analysis. The results revealed that three-fourth (75.00%) of the agriculture extension functionaries were having high and medium level of overall knowledge regarding ICT tools. It was also found that 72.80 percent of the variation in the knowledge of agriculture extension functionaries regarding ICT tools was explained by the 14 personal, socio-economic, psychological and communication characteristics of agriculture extension functionaries.

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1. INTRODUCTION

Agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economics of India. Agricultural extension in the current scenario of a rapidly changing world has been recognised as an essential mechanism for delivering knowledge (information) for modern farming [1,2]. Extension organisations have been concerned with what should be the appropriate means and approaches to getting the right agricultural information to the end-users (farmers) [3,4]. The updated information allows the farmers to cope with the highly localized nature of agriculture for which information must be tailored specifically to distinct conditions [5]. In recent times, however, there has been a revolution with regards to ICT in agriculture and particularly in extension service delivery of India [6,7]. The extension personnel is using a wide variety of ICT tools for seeking and dissemination of improved technologies to the farming community [8]. The knowledge on ICT tools by the agriculture extension personnel is a prerequisite for the use of ICT tools [9]. The Karnataka Government initiated 'Raitha Mitra Yojana' which translates to 'Farmer's Friend Scheme' during 2001 for providing effective extension services to the farmers. Raitha Samparka Kendras (RSKs) also known as Agricultural Extension Centers are established under Raitha Mitra Yojane at hobli or sub-block level i.e., between village level and block level of administration to address a wide range of local issues related to agriculture. The RSKs act as a common platform for farmers to access and interact with agriculture based technology and information at the grass root level. These Kendras are intended to provide technical information on crop selection, crop production, and crop protection related know-how, market and weather information, etc., to the farmers. They also provide seed and soil testing facilities locally and facilitate on-site provision of critical inputs like seeds, biofertilizers, plant protection chemicals, etc. RSKs also provide a forum for the on-farm demonstration on new technologies developed by both public and private sectors and act as an interface for public and (or) private sector technologies and inputs. The RSK is headed by an Agricultural Officer (Agricultural Graduate) duly supported by Assistant Agricultural Officers. These technical staffs are vested with the responsibility of disseminating agricultural technologies to the farming community from time to time [10]. Hence the present study was undertaken to assess the knowledge level of agriculture extension functionaries about ICT tools and also to find out the association between the personal, socio-economic psychological and communication characteristics of agriculture extension functionaries with their knowledge level of ICT tools.

2. METHODOLOGY

The present study was carried out in Tumakuru, Mysuru, Mandya and Hassan districts of Karnataka State during 2016-2017. Agriculture Officers and Assistant Agriculture Officers (who were willing to provide the required information voluntarily) from the four sampled districts were chosen for the study. Data was collected from the agriculture extension functionaries during the bimonthly meetings held in the District Agricultural Training Centres (DATCs) or Farm Science Centres/ Krishi Vigyan Kendras (KVKs) of the respective districts. The total sample constituted 80 Agriculture Officers (30 Nos) and Assistant Agriculture Officers (50 Nos) working in 43 Raitha Samparka Kendras in four sampled districts.

Knowledge level of agriculture extension functionaries was operationalized as *'the quantum of scientific information known to the respondents about the selected ICT tools'.* Fifteen ICT tools (Table 1) were selected to assess the knowledge level of agriculture extension functionaries. The test constituted 15 knowledge questions which were provided with three alternative answers including the correct answer. The knowledge test was administered to the respondents and they were asked to choose the correct answer. Quantification of knowledge item answers was made by giving a score of one and zero for correct and wrong answers, respectively. The scores of all the ICT tools/ knowledge items were summed up to get knowledge score of the respondent. The summation of scores for a particular respondent indicated his knowledge level about ICTs. The maximum score one would get was 15 and the minimum score was zero. Based on the total score obtained for all the 15 knowledge items/ ICT tools, the respondents were classified into three categories namely, 'low', 'medium' and 'high' considering mean (11.50) and half standard deviation (1.27) as a measure of check.

Table 1. Specific knowledge of agriculture extension functionaries regarding ICT tools (n=80)

Sl. no.	Knowledge items	Agriculture extension functionaries			
		Correct knowledge		Incorrect knowledge	
		Number	Percent	Number	Percent
1.	**ICT stands for** → Information and communication technology	65	81.25	15	18.75
2.	**Radio** → Is an electronic audio-medium used for broadcasting the programmes	62	77.50	18	22.50
3.	**Television** → Is ann electronic audio-visual medium which provides pictures with synchronized sound	73	91.25	7	8.75
4.	**Telephone** → Is a telecommunication device used to transmit and receive sound (most commonly voice and speech) across the distance	70	87.50	10	12.50
5.	**Mobile** → Is an electronic telecommunications device, often referred to as a cellular phone or cell phone, which connects to a wireless communications network through radio wave or satellite transmissions and provide voice communications, Short Message Service (SMS), Multimedia Message Service (MMS), and smartphones may also provide Internet services such as Web browsing and e-mail.	75	93.75	5	6.25
6.	**Computer** → Is a programmable machine that receives input, stores and manipulates data/information, and provides output in a useful format	74	92.50	6	7.50
7.	**Internet** → Is a global system of interconnected computer networks that use the Standard Internet Protocol Suite (TCP/IP) to serve billions of users worldwide	66	82.50	14	17.50
8.	**E-mail** → Is a method of exchanging digital messages across the Internet/computer network	58	72.50	22	27.50
9.	**Web-based search engines** → Is a web search engine is a tool designed to search for information on the WWW	53	66.25	27	33.75
10.	**Decision support system** → Is a computer based information system that support business and organizational decision- making activities	53	66.25	27	33.75
11.	**Video camera**→ Is a device that records video in a digital format to a disk drive, USB flash drive SD memory card or other mass storage device	67	83.75	13	16.25
12.	**Video conferencing**→ Is a video channel or a 2-way cable television system which provides the picture and sound of both the sender and receiver of message	68	85.00	12	15.00
13.	**Kiosks** → Is a computer based terminal or display that provides information or services in public places.	26	32.50	54	67.50
14.	**e-newspaper** →Is a newspaper that exists on the World Wide Web or Internet	48	60.00	32	40.00
15.	**e-agricultural magazine** → Is a magazine that exists on the World Wide Web or Internet	64	80.00	16	20.00

Data on 14 personal, socio-economic and psychological characteristics of agriculture extension functionaries (Table 3) were collected using a pre-structured schedule with suitable scales. The collected data was scored, tabulated and analysed using frequency, percentage, standard deviation, chi-square test and multiple regression analysis. A larger number (40.00%) of the extension functionaries belonged to middle age group, followed by 38.75 and 21.25 percent of them belonging to old and young age groups, respectively.

3. RESULTS AND DISCUSSION

3.1 Specific Knowledge of Agriculture Extension Functionaries Regarding Information and Communication Technology Tools

Table 1 reveals the specific knowledge level of agricultural extension functionaries regarding ICT tools. Majority of the extension functionaries had 'correct knowledge' regarding mobile phone (93.75%), computer (92.50%), television (91.25%), telephone (87.50%), video conferencing (85.00%), video camera (83.75%), internet (82.50%), meaning of ICT (81.25%), e-agricultural magazine (80.00%), radio (77.50%), e-mail (72.50%), web based search engines (66.25%), decision support system (66.25%) and e-newspaper (60.00%). Whereas, about one-third (32.50%) of the extension functionaries possessed 'correct knowledge' regarding information kiosks. The possible reason for agriculture extension functionaries having 'correct knowledge' on the ICT tools may be due to the frequent use of these ICT tools and also supported by the 'principle of learning' that 'learning is more when it is repeatedly used'. The other possible reason might be that majority of the agriculture extension functionaries during interview mentioned that they had undergone training on ICTs and hence the agriculture extension functionaries possess 'correct knowledge' of the ICT tools. The present findings are in line with the findings of Sulaiman Umar, et al. [11].

A majority (61.50%) of the agriculture extension functionaries had 'incorrect knowledge' on information kiosk. Non-availability of the information kiosk in RSKs and lack of awareness of information kiosk might be the reasons for a majority of the agriculture extension functionaries having 'incorrect knowledge' on information kiosk.

3.2 Overall Knowledge Level of Agriculture Extension Functionaries on Information and Communication Technology Tools

As high as 42.50 percent of the agriculture extension functionaries had overall high level of knowledge regarding ICT tools whereas 32.50 and 25.00 percent of them were having medium and low overall knowledge level, respectively (Table 2). It can be inferred that three-fourth (75.00%) of the agriculture extension functionaries were having a high and medium level of overall knowledge regarding ICT tools. The reasons quoted in specific knowledge items also holds good here also for the majority (75.00%) of agriculture extension functionaries possessing medium to high level of overall knowledge regarding ICT tools. Similar findings were reported by Bansode and Narfide [12].

3.3 Association between the Personal, Socio-economic and Psychological Characteristics of Agriculture Extension Functionaries with their Knowledge Level

The chi-square test was employed to find out the association between the personal, socio-economic, psychological and communication characteristics of agriculture extension functionaries with their knowledge level on ICT tools. The results in Table 3 indicate that education, e-readiness and training on ICT tools of extension functionaries had significant association with their knowledge level on ICT tools at one percent level of probability. Whereas, job experience, achievement motivation, innovative proneness, job involvement, accessibility to ICT tools, organizational climate and mass media utilization of agriculture extension functionaries were found to be having significant association with their knowledge level on ICT tools at five percent level of probability. The remaining four variables namely, age, rural-urban background, scientific orientation and perceived work load of agriculture extension functionaries were found to be having non-significant association with their knowledge of ICT tools. For every unit increase in the education, e-readiness, training on ICT tools, job experience, achievement motivation, innovative proneness, job involvement, accessibility to ICT tools, organizational climate and mass media utilization of extension functionaries, there will be an increase in the

Table 2. Overall knowledge level of the agriculture extension functionaries regarding ICT tools (n=80)

Sl. No.	Categories	Extension functionaries	
		Number	Percent
1.	Low (< 10.25 score)	20	25.00
2.	Medium (10.25- 12.80 score)	26	32.50
3.	High (> 12.80 score)	34	42.50
Total		80	100.00

Table 3. Association between and extent of contribution of personal, socio-economic, psychological and communication characteristics of agriculture extension functionaries on the knowledge regarding ICT tools (n=80)

Sl. No.	characteristics	Chi square value	Regression co-efficient	SE of regression co-efficient	't' value
1.	Age	2.61^{NS}	0.277	0.258	0.93^{NS}
2.	Education	13.69**	0.147	0.416	2.812**
3.	Rural-urban background	2.60^{NS}	0.240	0.315	1.31^{NS}
4.	Job experience	9.99*	0.123	0.112	0.91^{NS}
5.	Achievement motivation	9.01*	0.194	0.176	0.90^{NS}
6.	Innovative proneness	8.99*	0.318	0.671	2.11*
7.	Scientific orientation	2.59^{NS}	0.190	0.310	1.61^{NS}
8.	Perceived work load	3.98^{NS}	0.112	0.179	1.59^{NS}
9.	Job involvement	9.68*	0.106	0.211	1.99^{NS}
10.	Accessibility to ICT tools	11.22*	0.317	0.670	2.12*
11.	e-readiness	14.91**	0.124	0.519	4.18**
12.	Organizational climate	10.19*	0.209	0.441	2.11*
13.	Training on ICT tools	14.69**	0.145	0.612	4.21**
14.	Mass media utilization	11.61*	0.405	0.810	2.00*

*NS=Non-significant, * Significant at 5 percent level, ** Significant at 1 per cent level, SE= Standard Error; R^2= 0.7280; F = 9.69***

knowledge level on ICT tools. More or less similar findings were reported by Ajayi, et al. [13] and Sulaiman Umar, et al. [11].

3.4 Extent of the Contribution of Personal, Socio-economic and Psychological Characteristics of Agriculture Extension Functionaries on the Knowledge Level

The multiple regression analysis was employed to determine the extent of contribution of personal, socio-economic, psychological and communication characteristics of extension functionaries with their knowledge level of extension functionaries regarding ICT tools. The data in Table 3 also reveals that education, e-readiness and training on ICT tools of extension functionaries were significantly contributing to the knowledge regarding ICT tools at one percent level of probability. Whereas, innovative proneness, accessibility to ICT tools, organizational climate and mass media utilization of agriculture extension functionaries were significantly contributing to their knowledge regarding ICT tools at five percent level of probability. The remaining variables namely, age, rural-urban background, job experience, achievement motivation, scientific orientation, perceived workload and job involvement had not significantly contributed to the knowledge of extension functionaries regarding ICT tools. The results also indicated that 72.80 percent of variation in the knowledge of extension functionaries regarding ICT tools was explained by all the 14 personal, socio-economic and psychological characteristics of agriculture extension functionaries included in the study as

evidenced by R^2 value of 0.7280. It can be inferred that variables such as education, e-readiness, training on ICT tools, innovative proneness, accessibility to ICT tools, organizational climate and mass media utilization of extension functionaries have immensely contributed to the knowledge of extension functionaries regarding ICT tools.

4. CONCLUSION

The results of the present study have revealed that as high as 75.00 percent of the agriculture extension functionaries were having medium to high level of overall knowledge regarding ICT tools. Further, it is found that education, job experience, achievement motivation, innovative proneness, job involvement, accessibility to ICT tools, e-readiness, organizational climate, training on ICT tools and mass media utilization of agriculture extension functionaries had significant to highly significant association with their knowledge regarding ICT tools. Therefore, the Karnataka State Department of Agriculture should arrange for conducting periodic training to the agriculture extension functionaries working in Raitha Samparka Kendras for increasing their knowledge and upgrading skill for effective utilization and maintenance of ICT tools. Mass media like radio, television, internet, magazines, newspaper etc., should carry messages on using new ICT tools available in the market for enhancing the knowledge of agriculture extension functionaries for effective use of ICT tools.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Agwu AE, Mba Uche UC, Akinnagbe OM. Use of information communication technologies (ICTs) among researchers, extension workers and farmers in Abia and Enugu states: Implications for a national agricultural extension policy on ICTs. J. Agricultural Extn. 2008;12(1):37-49.
2. Woreta SA, Kebede Y, Zegeye DT. Knowledge and utilization of information communication technology (ICT) among health science students at the University of Gondar, North Western Ethiopia. BMC Medical Informatics and Decision Making. 2013;13(1):31.
3. Bahgat MA, Antar SM. Evaluations of extension personnel in Assiut governorate of their levels of knowledge and use and the degree of importance of information communication technology. African Crop Science Conference Proceedings. 2007;8:1307-1311.
4. Yakubu DH, Abubakar BZ, Atala TK, Muhammed A. Use of information and communication technologies among extension agents in Kano State, Nigeria. Journal of Agricultural Extension. 2013; 17(1):162-173.
5. Ndag I, Sanusi RA, Aigbekaen EO. Comparative analysis of information and communication technology (ICT) use by agriculture extension workers. Paper presented in: 19th Annual International Information Management Association. 2008;13-15.
6. Kannappanavar BU, Madhu KN. Use pattern of electronic resources by scientists of Indian Institute of Spices Research (IISR): A case study. International Journal of Digital Library Services. 2015;5(4):76-98.
7. Raghava NV, Punna Rao P. ICT use behaviour of scientists of Krishi Vigyan Kendras. Journal of Communication Studies. 2014;32:3-12.
8. Meera SN, Sain M, Muthuraman P, Kumar AS, Sailaja B, Jyothi SSP, Viraktamath BC. Critical analysis of e-Learning opportunities and e-Readiness in the public extension system: Empirical evidence from Tamil Nadu. J. Global Communication. 2010; 3(2):11-18.
9. Naik G, Narayanaswamy C, Lakshminarayan MT. Knowledge status of field extension workers on audio-visual aids. Mysore J. Agric. Sci. 2011;45(2):379-381.
10. Nagalakshmi C, Swamy BKN. Perception, awareness, attitude and knowledge of extension personnel about information communication technologies. Mysore J. Agri. Sci. 2011;45(2):421-426.
11. Sulaiman Umar, Michael Wamdzu Musa, Yetunde Toluwase Olayemi, Rabiu Suleiman. Awareness and use of information and communication tech-nologies among extension agents in Kaduna state of Nigeria. J. Agri. Extension. 2015;19(1):66-77.

12. Bansode SN, Narfide B. Information seeking behaviour of B-School faculty members in digital environment: A case study. International Journal of Information Dissemination and Technology. 2014;4(2): 130-134.

13. Ajayi AO, Alabi OS, Akinsola TO. Knowledge and perception of extension agents on information and communication technologies (ICTs) use in extension service delivery in Ondo state, Nigeria. African J. Agric. Res. 2013;8(48):6226-6233.

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