

**RESEARCH ARTICLE :**

# Utilization of information and communication technology tools by the extension personnel of Kerala

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**SUMMARY :** This study was conducted to analyse the utilization pattern of information and communication technologies (ICTs) among the agricultural extension personnel of Kerala. Data were collected from 150 Agricultural Officers working in different districts of Kerala. It was observed that 66 per cent of the extension personnel were females, more than two-third of the extension personnel (71.33%) had only medium level of innovation proneness. Almost three-fourth (74.66%) of the extension personnel did not receive trainings related to ICTs. With regard to the attitude towards ICTs, majority (86.66%) of the extension workers were under medium category. The ICT tools with low extent of accessibility were decision support system, video camera, video conferencing and kiosk, with less than 25 per cent. The respondents were evenly distributed among the categories of very less frequent users, less frequent users, frequent users with 26 per cent each and most frequent users with 22 per cent only. More than 70 per cent of the respondents spent 1-5 hrs per week in using various ICT tools.

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## BACKGROUND AND OBJECTIVES

ICTs are believed to bring about social and economic development by creating an enabling environment for work improvement. Almost every single activity in the modern world is becoming more dependent on the application of ICTs. ICT in agriculture is an emerging field that involves application of innovative ways to use information and communication technologies (ICTs) in the rural domain. The advancements in ICTs can be utilized for providing accurate, timely and relevant information and services to farmers, there by facilitating an environment for more

remunerative agriculture. Agricultural extension officers are the direct link bridging the communication gap between the agricultural researchers and the farmers. In order to perform this role effectively and efficiently, agricultural extension personnel must have steady access to upto-date agricultural information. This brings a comprehensive and well articulated agricultural extension system which ensures adequate and timely delivery of services to farmers, if meaningful growth is to be achieved in the agricultural sector.

Most of the studies on ICTs have

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significantly addressed the scope and understanding of the sector in terms of contribution towards extension activities. Despite the huge potential of harnessing ICT for agricultural development, only a few isolated projects have been initiated in India and in other parts of the world. Interestingly, many of these projects were initiated by NGOs, private organizations, co-operative bodies and governmental organizations rather than by government established agricultural departments. This shows the apathy of agricultural development departments towards incorporating ICT in their day-to-day activities. The utilization pattern of ICT tools by the extension personnel are to be studied and the experience gained must be documented in order to draw lessons for the future. Therefore, the present study was undertaken with the specific objective of studying the utilisation pattern of ICT tools by the extension personnel.

## RESOURCES AND METHODS

For the study purpose, five districts were randomly selected, one each from the five agro-climatic zones of Kerala. The districts selected were Kannur from the north zone, Wayanad from the high altitude zone, Thrissur from the central zone, Thiruvananthapuram from south zone and Alappuzha from the problem zone. All the Krishi Bhavans in Kerala are computerized to utilize the advances in information and communication technologies (ICTs) for the transfer of technologies and administrative purpose. Hence, agricultural officers being one of the most important stakeholders of these technologies, they were selected as respondents. From each district 30 agricultural officers were selected randomly, logically covering agricultural officers from one third of the districts, constituting 150 respondents. A total of 15 ICT tools which have the potential to be used by the extension personnel were selected for the study. The ICT tools such as radio, television, land phone, mobile phone, computer, e-mail, web based search engine, web based agriculture information portals, decision support system, video conferencing, agri kiosks, e- newspaper, e-journals and e-agricultural magazines were selected. A detailed pre-tested schedule was prepared to know the extent, purpose, duration of utilisation and utilisation pattern of various ICT tools under study. The appropriate responses were collected from the respondents through mailed questionnaires. Statistical measures like percent, mean, standard deviation and 't' test were utilized for data

evaluation by using SPSS programme.

### Utilization index:

For this study a range of questions related to the utilization of ICT tools were identified and selected based on discussion with experts. As per the responses from the pilot study, the questions were included in the questionnaire. The scores for each ICT tool was added up and the total score on utilization was obtained. Then the individual's total scores were divided by the maximum possible score and expressed in 100.

$$\text{Utilization index (UI)} = \frac{\text{Total scores obtained}}{\text{Total possible score}} \times 100$$

## OBSERVATIONS AND ANALYSIS

The findings of the present study as well as relevant discussion have been summarized under following heads:

### Profile characteristics of the extension personnel:

From Table 1, it can be observed that nearly half the percentage of the selected extension personnel (48.66%) belonged to the age group between 35-45 years and 34.66 per cent of them were above 45 years. Very less per cent of them (16.66%) came under the category of below 35 years. About two-third (66.7%) of the extension personnel of Kerala were females and remaining were males. Most of the respondents had B.Sc. Agriculture (46.66%) and M.Sc. Agriculture (41.33%) degrees. While the remaining respondents included diploma holders (6%), degree (4%) and Ph.D. holders (2%).

Majority of the extension workers (62%) were having medium experience in their profession. Only 22 per cent of the extension personnel were less experienced in their profession followed by highly experienced officers (16%). About 75 per cent of the extension personnel did not attend any training programmes related to ICTs. Majority (61.33%) of the respondents were under medium mass media utilization followed by high (22%) and low level (16.66%) of mass media utilization. More than two-third of the extension personnel (71.33%) had medium level of innovation proneness. High level of innovation proneness was noted among less than one-fourth of the extension personnel (14.66%). The findings are in conformity with that of Babu (2006).

Majority of the extension workers (86.66%) had medium level of attitude towards ICT tools. From Table

## Utilization of information &amp; communication technology tools by the extension personnel

Table 1: Distribution of respondents according to their profile characteristics			(n=150)
Sr.No.	Category	Frequency	Percentage
<b>Age</b>			
1.	Below 35 years	25	16.66
2.	35-45 years	73	48.66
3.	Above 45 years	52	36.66
<b>Gender</b>			
1.	Male	51	34.00
2.	Female	99	66.00
<b>Educational status</b>			
1.	Diploma	9	6.00
2.	Degree	6	4.00
3.	B.Sc. Agriculture	70	46.66
4.	M.Sc. Agriculture	62	41.33
5.	PhD	3	2.00
<b>Experience</b>			
1.	Less (<5.05 years)	33	22.00
2.	Medium(5.05-19.57 years)	93	62.00
3.	High (>19.57 years)	24	16.00
	Mean:12.31	SD:7.26	
<b>Trainings received on ICTs</b>			
1.	Not received trainings on ICTs	112	74.66
2.	Received trainings on ICTs	38	25.33
<b>Mass media utilization</b>			
1.	Low (<23.45)	25	16.66
2.	Medium(23.45-30.03)	92	61.33
3.	High (>30.03)	33	22
	Mean:26.74	SD:3.29	
<b>Innovation proneness</b>			
1.	Low (<19.42)	21	14
2.	Medium(19.42-23.38)	107	71.33
3.	High (>23.38)	22	14.66
<b>Attitude towards ICTs</b>			
1.	Low (<16.77)	19	12.66
2.	Medium (16.77-19.23)	130	86.66
3.	High (>19.23)	1	0.66
	Mean:18	SD:1.23	
<b>Infrastructure and other resource facilities</b>			
1.	Low (<4.78)	-	-
2.	Medium(4.78-7.7)	114	76
3.	High (>7.7)	36	24
	Mean:6.24	SD:1.46	

1, it can be derived that more than three-fourth (76%) of the extension personnel from the selected districts of Kerala had medium level of infrastructure and other resource facilities and the remaining 24 per cent had high level of infrastructure and other resource facilities. The findings of Kabir and Roy (2015) are similar to these findings.

### Accessibility of the extension personnel to ICT tools:

It is perceived from Table 2 that the accessibility of extension personnel to various ICT tools like radio,

television, land phone, mobile phone, computer, internet, e-mail, were very high with more than 85 per cent. These findings are in agreement with that of Yakubu *et al.* (2014).

The ICT tools with low accessibility were decision support system, video conferencing and agri kiosk with a percentage of less than 20. This implies that there is still a huge gap in the operational knowledge of the extension agents towards certain ICT tools. Hence, adequate training on efficient operation of contemporary ICTs should be organized for the extension workers. It helps them to be aware of emerging ICT applications in

Sr. No.	ICT tools	Accessible		Not accessible	
		Number	%	Number	%
1.	Radio	139	92.66	11	7.33
2.	Television	129	86	21	14
3.	Landphone	143	95.3	7	4.70
4.	Mobile phone	150	100	-	-
5.	Computer	148	98.66	2	1.33
6.	Internet	143	95.3	7	4.70
7.	email	143	95.3	7	4.70
8.	DSS	29	19.33	121	80.66
9.	Agri-kiosk	24	16	126	84
10.	Video conferencing	22	14.70	128	85.33

Sr. No.	User categories	Frequency	Percentage
1.	Very less frequent users (>59.13)	39	26.00
2.	Less frequent users (60-62.60)	39	26.00
3.	Frequent users (63.47-67.72)	39	26.00
4.	Most frequent users (68.69-94.78)	33	22.00

Sr. No.	Categories	Mean utilization index	t value
<b>Gender</b>			
1.	Male	63.93	0.233 <sup>NS</sup>
2.	Female	62.09	
<b>Educational qualification</b>			
1.	B.Sc. Agriculture	63.55	0.107 <sup>NS</sup>
2.	M.Sc. Agriculture	60.94	
<b>Trainings received on ICTs</b>			
1.	Yes	63.50	1.79 <sup>+</sup>
2.	No	60.46	

NS=Non-significant

<sup>+</sup> Significant at 10% level

their work situation.

### Extent of utilization of ICT tools by extension personnel:

It is noted from Table 3 that proportion of respondents in the different user categories based on frequency of use was almost similar. More than one fourth of the extension personnel came under the categories like 'very less frequent users' (26%), 'less frequent users' (26%) and 'frequent users' (26%). The percentage of respondents under 'most frequent users' category were 22 per cent only. Even distribution of extension personnel among the four categories of users of ICT tools indicated that extension personnel were diverse in utilizing ICT tools. The user categories of

extension personnel such as 'very less frequent users' and 'less frequent users' needed the attention. The State Department of Agriculture should identify these two categories of users and either they must be deputed for the capacity building programmes organized by different agencies or the state agriculture department should organize training programmes to empower extension personnel in using ICT tools. These findings derive support from the findings of Manty (2011). Mobile phones and computers were the frequently used ICT tools by the extension personnel. Familiarity, compatibility and less expensive nature of these ICT tools may be the reasons for their frequent use. Some ICT tools like DSS, kiosk, video conferencing were less utilized because of less accessibility, lack of personal skills, insufficient funds to

**Table 5 : Correlation between utilization of ICT tools and independent variables**

Sr. No.	Independent variables	Correlation co-efficient
1.	Age	-0.207**
2.	Educational status	-0.130
3.	Experience	-0.074
4.	Innovation proneness	0.166*
5.	Mass media utilization	0.107
6.	Attitude towards ICTs	0.121

\* and \*\* indicate significance of values at P=0.05 and 0.01, respectively

**Table 6 : Distribution of respondents according to their duration of utilization of ICT tools**

(n=150)

Sr. No.	ICT tools	Percentage of respondents			
		1-5 hrs/week	5-10 hrs/week	10-15 hrs/week	Above 15 hrs/week
1.	Radio	85.30	8.00	3.3	3.3
2.	Television	60	24.7	6.7	6.7
3.	Land phone	64.7	12.7	9.3	13.3
4.	Mobile phone	48.7	20.7	12.7	18
5.	Computer	41.3	14	24.7	20
6.	e-mail	54.7	14	19.3	12
7.	Web based search engines	69.3	14	10	6.7
8.	Web based agriculture information portals	72	17.3	8	2.7
9.	Decision support system	88.6	3.4	2.7	5.4
10.	Video conferencing	92	.7	2.70	5.4
11.	Agri kiosk	91.3	1.3	2.7	4.7
12.	E news paper	86.7	3.3	6.7	3.3
13.	e-journals	93.3	2	1.3	3.3
14.	e-agricultural magazines	89.3	2	5.3	3.3
	Average	74.09	9.86	8.24	7.72

purchase these tools, busy schedule with other official and personal engagements etc.

### **Comparative evaluation of utilization of ICT tools by extension personnel and selected independent variables:**

A comparative analysis of utilization of ICT tools by the extension personnel and the selected independent variables such as gender, educational status and trainings received on ICTs was done and the results presented in Table 4, revealed that the trainings received on ICTs showed a significant difference among extension personnel. There was a significant difference in the extent of utilization of ICTs between those who received trainings on ICTs and who did not receive trainings. The extension personnel who received trainings utilized the ICTs more. It is justifiable that the extension personnel who received more trainings related to ICT tools may utilize those technologies more.

It is also shown that there is no significant difference between the two genders of the extension personnel regarding their utilization of ICT tools. Similarly there was no significant difference in utilization based on educational qualification among the extension personnel. This implies that ICT tools have penetration among the agricultural extension personnel of Kerala irrespective of their gender and educational qualifications.

### **Correlation between utilization of ICT tools and independent variables among extension personnel:**

The results of simple correlation analysis were taken into consideration for analyzing the influence of independent variables on the utilization of ICT tools of the extension personnel. The results in Table 5 revealed that out of the selected independent variables, only age was found negatively and significantly related with utilization of ICT tools among the extension personnel with a 'r' value of -0.207 at 0.01 level of significance. Table 5 also revealed that the co-efficient of correlation between utilization of ICT tools and innovation proneness was positively and significantly related with a 'r' value of 0.166 at 0.05 level of significance. Age of extension personnel was an important attribute for the utilization of ICT tools. The probable reason might be that when age of the extension personnel increased utilization of ICT tools decreased and *vice versa*.

Innovation proneness of the extension personnel is an important attribute for the utilization of ICT tools. This

might be because most of the extension personnel from the state department of agriculture were keen to know about new ICT tools and always had urge to do new things and attain new achievements which helped them to develop favourable attitude towards ICT tools.

### **Duration of utilization of ICT tools by extension personnel:**

It is revealed from Table 6 that more than 70 per cent of the respondents spent 1-5 hours per week in using various ICT tools. Only less than 40 per cent of the respondents used to spend 5-10 hours per week for accessing ICT applications. A very less per cent of the extension officers used to spend 10-15 hours and above 15 hours per week for ICT related activities. Computer (20.00%), Internet (19.30%) and mobile phones (18.00%) were the major ICT tools used by extension personnel for the duration of more than 15 hours per week. Therefore, it can be concluded that computer, internet and mobile phones were the intensively used ICT tools by extension personnel of Kerala for the transfer of technologies.

### **Conclusion:**

Based on the major findings of the study, it can be concluded that 66 per cent of the extension personnel were females, more than 70 per cent of extension personnel had only medium level of innovation proneness. Three-fourth of the extension personnel (74.66%) did not receive trainings related to ICTs. Majority of the extension workers (86.66%) had medium level of attitude towards ICT tools. It is also revealed that more than 85 per cent of the extension personnel had access towards ICT tools such as radio, television, land phone, mobile phone, computer, e-mail, web based search engine and web-based agriculture information portals. The ICT tools with low extent of accessibility were Decision Support system, video camera, video conferencing and kiosk, with less than 25 per cent.

It is revealed from the study that the extension personnel were evenly distributed among the four user categories *viz.*, very less frequent users (>59.13), Less frequent users (60-62.60), frequent users (63.47-67.72), most frequent users(68.69-94.78). More than 70 per cent of the respondents spent 1-5 hrs per week in using various ICT tools. The per cent of extension personnel who spent 5-10 hours per week for using various ICT tools ranged from 0.7 to 24.7. Out of the selected independent variables,

age was found negatively and innovation proneness was positively and significantly related with utilization of ICT tools among the extension personnel.

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