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# International Journal of Extension Education

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## Barriers and Preparedness of Agricultural Extension Workers towards ICT Utilization in Gazipur District of Bangladesh

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### ABSTRACT

*The purpose of the present study was to determine the extent of perception on barriers and preparedness of agricultural extension workers towards ICT utilization in Gazipur district of Bangladesh. A sample of 90 respondents was selected from the district following the proportionate random sampling technique. Data were collected using a structured questionnaire. Standard statistical measures were used. Perceived barriers of agricultural extension workers to ICT utilization were measured considering four dimensions viz. i) organizational barrier ii) personal barrier iii) technological barrier and iv) policy barrier. Preparedness of agricultural extension workers towards ICT utilization were measured considering four dimensions namely i) farmers' preparedness ii) personal preparedness iii) infrastructure preparedness and iv) management preparedness. Very big majority of the respondents (87.8%) encountered high barriers while 88.9 per cent of them encountered medium preparedness towards ICT utilization. The organizational barrier to ICT utilization in agriculture was relatively higher than three other dimensions followed by personal barriers, technological and policy barriers. Management preparedness was relatively upper compare to other three dimensions. Infrastructure preparedness came next rank following personal preparedness and farmers' preparedness. Training exposures, innovativeness, job satisfaction, cosmopolitanism, use of information sources and knowledge had negative significant relationship with their perceived barriers to ICT utilization. Conversely, training exposures, innovativeness, job satisfaction, cosmopolitanism, use of information sources and knowledge showed positive significant relationship with their perceived preparedness towards ICT utilization.*

**Key words :** Barriers, preparedness, ICT, agricultural extension workers, utilization

The use of information and communication technology (ICT) is becoming progressively more widespread throughout various sectors including education, business as well as agriculture. One of the most popular ICT applications is e-Learning. With e-Learning, we can use available technologies to enhance learning and expand access to education and training in the agricultural sector (Omotayo, 2005). According to Technical Centre for Agricultural and Rural Cooperation (CTA), ICT are technologies which facilitate communication and thus the processing and transmission of information electronically. ICT includes technologies and methods for storing, managing and processing as well as communicating information (Akpabio et al., 2007). ICT as an extension tool could enhance the flow of information in the application of agricultural extension services. Agricultural extension, which depends to a large extent on information exchange between and among farmers, has been identified as one area in which ICT can have a particularly significant impact (Ballantyne and Bokre, 2003). Barriers and Preparedness is relative term, and their type, nature affect ICT utilization in agriculture. Similarly, the ICTs mean for a number of information disseminating devices. Information and communication help both in economic and non-economic development which includes benefits such as improved law enforcement, reduced income inequality, more rapid and effective communications during disasters and stronger kinship bonding and facilitated information delivery and knowledge sharing among farmers, extension agents and other stakeholders (Harris, 2002). E-learning in agricultural fields is still

in the early phases of adoption. Agriculture is the mainstay of Bangladesh. The economy of Bangladesh is based on agriculture, industry and services. Agriculture is one of the vital sectors in which ICT can be used reasonably in transferring the modern agricultural technologies to the farmers. Information and communication technology in agriculture includes internet, radio/community radio, television, wireless communication tools, cell phone, audio visuals, digital camera, Geographic Information System (GIS), Global Positioning System (GPS) and other technologies which direct the agricultural activities towards precision agriculture. ICT as tools for communication by the extension organizations faces barriers and obstacles. High start-up costs, infrastructural obstacles, lack of good and skillful trainers, poor connectivity and rugged hardwires are among some of the barriers (Mirzaei, 2003). The present study intends to explore factors, which affect the barriers and preparedness towards ICT utilization. Identifying these factors help increase the knowledge of the extension personnel in using ICT for the agricultural sector. Therefore, the present study was under taken to i) determine the extent of barriers faced by agricultural extension workers towards ICT utilization; ii) explore the extent of preparedness of agricultural extension workers towards ICT utilization; and iii) find out the relationship and contribution between selected characteristics of the agricultural extension workers and their extent of barriers and preparedness.

**METHODOLOGY**

The study was conducted in Gazipur district which consist of five upazilas viz. Kapasia, Sreepur, Kaliakoir, Kaligonj and Gazipur Sadar upazila. The Sub Assistant Agriculture Officers (SAAOs) of the Gazipur district were the target population of this study. The total target population in Kapasia, Sreepur, Kaliakoir, Kaligonj and Gazipur Sadar upazilas, of Gazipur district were 214, out of this population, a number of 90 (42%) SAAOs were selected as the sample of the study following the proportionate random sampling. A pre-tested interview schedule was used to collect data from the respondents. To measure barriers and preparedness towards ICT utilization a 5-point Likert type scale ranging from ‘strongly disagree’ to ‘strongly agree’ was used. Barriers and preparedness scores of a respondent was obtained by summing up the weights for his/her 20 statements on four dimensions. The barriers and preparedness score could range from 20 to 100, while 20 indicating low barriers and preparedness and 100 indicating highest level of barriers and preparedness. Statistical measures like number, range, percent, mean, standard deviation and Pearson’s correlation coefficient (r), analysis of variance and multiple regression analysis were utilized both for data evaluation and hypotheses testing by using SPSS program. Barriers and Preparedness Index was computed for each of four dimensions by using the following formula as used by Mansur (1989).

$$\text{Barriers/Preparedness Index} = (P_l \times 1) + (P_m \times 2) + (P_h \times 3)$$

Where,

Pl = Percentage of agricultural extension workers having low barriers/preparedness

Pm = percentage of agricultural extension workers having medium barriers/preparedness

Ph = percentage of agricultural extension workers having high barriers/preparedness

In order to measure the extent of barriers and preparedness on the statement of each aspect modified Mean Index (MI) was used as developed by Biswas (2004).

$$\text{Mean Index (MI)} = \frac{f_1 X_1 + f_2 X_2 + \dots + f_n X_n}{N} \times 100$$

$$= \frac{\sum_{i=0}^n f_n X_n}{N} \times 100$$

Where,

Xi = scale value at the ith priority of the statement

fi = Frequency of responses on that statement

n = number of statements in the parameter

N = number of respondents

i = 1,2,3,.....n

**RESULTS AND DISCUSSION**

Detailed discussions of barriers and preparedness of the agricultural extension workers towards ICT utilization have been presented in sub-sections:

**Dimensions of barriers**

The barriers faced by the agricultural extension workers towards ICT utilization were conceptualized as consisting of four dimensions namely i) organizational barriers ii) personal barriers iii) technological barriers and iv) policy barriers. For each dimensions of barriers the respondents’ actions were arbitrarily judged from 1(low barrier) to 25 (high barrier) continuum. The salient features of different components have been presented in Table 1.

**Table 1**  
Salient features of the different dimensions of barriers faced by respondents towards ICT utilization

Dimensions of barriers	Observed score range (Possible range: 1-25)	Barrier Index	Rank
Organizational barriers	13-25	216.60	1
Personal barriers	11-24	211.11	2
Technological barriers	8-24	205.60	3
Policy barriers	10-23	190.80	4

Data contained in Table 1 show that organizational barrier ranked first followed by personal and technological barriers.

**Organizational barriers**

These can be ranged from physical items to individual and group attitudes that restrain or obstruct progress, access, etc. It is important factor to utilize ICT in agriculture. Findings contained in the Table 2 hint that big majority (92.2%) of the respondent encountered medium to high organizational barriers. Reason behind that might be due to lack of technical support from the organization. Other potential organizational barriers were lack of awareness in availability of ICT and lack of interest by top managers and extension experts to use ICT found in the study area.

**Table 2**  
Distribution of the respondents according to their barriers in four dimensions

Dimensions	Category	Respondents		Mean	SD
		No.	Percent		
Organizational barriers	Low (up to 15 )	7	7.8	18.97	2.21
	Medium (16-20)	61	67.8		
	High (21-25)	22	24.4		
Personal barriers	Low (up to 15 )	10	11.11	18.51	2.51
	Medium (16-20)	60	66.67		
	High (21-25)	20	22.22		
Technological barriers	Low (up to 15 )	13	14.4	17.95	2.82
	Medium (16-20)	59	65.6		
	High (21-25)	18	20.0		
Policy barriers	Low (up to 15 )	18	20.0	17.42	2.67
	Medium (16-20)	62	68.9		
	High (21-25)	10	11.1		

**Personal barriers**

Personal barriers are self-controlled factors that prevent people from accomplishing their goals or cause them to behave in a self-sabotaging way. Findings in Table 2 indicate that best part of the respondents (88.89%) demonstrated medium to high personal barriers. Most of the respondents in the study area had very low confidence in ability to use ICT and poor skills to use ICT. On the other hand, language problems towards using ICT and time management problems in using ICT were the potential personal barriers of the respondents in the study area.

**Technological barriers**

Technological barrier is an obstacle to utilizing ICT that restrains observable and measurable technical competencies. It is one of the crucial factors to utilize ICT. Data presented in Table 2 indicate that huge proportion (85.6%) of the respondents came across medium to high technological barriers. Because of low computer literacy level in agricultural service provider community, lack of appropriate hardware and software and the limitation of virtual training for operational technique most of the respondent faced high technological barriers in the study area.

**Policy barriers**

Policy barrier is an obstacle which prevents a given policy instrument being implemented, or limits the way in which it can be implemented. In the extreme, such barriers may lead to certain policy instruments being overlooked, and the resulting strategies being much less effective. Information displayed in the Table 2 indicates that great part of the respondents (88.9%) exposed with low to medium technological barriers. Reason behind that might be due to lack of strategic vision in development of e-learning, law related to ICT policies in agriculture sector are not user supported and budget allocation for ICT in the agriculture sector are insufficient.

**Overall barriers faced by the respondents**

The overall barriers scores of the respondents ranged from 42 to 96 against the possible range of 1 to 100, with an average 72.86. Data contained in Figure 1 indicate that the highest proportion (87.8%) of the respondents had medium to high barriers towards ICT utilization in agriculture.

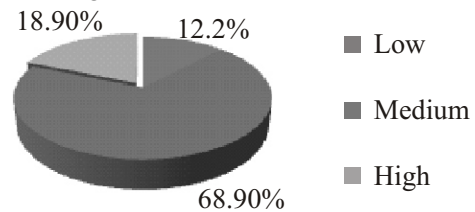


Figure 1. Distribution of respondents according to their overall barriers towards ICT utilization

**Rank order of the statements of barriers across four dimensions**

A rank order of the statements considering four dimensions regarding barriers towards ICT utilization according to their Mean Barrier Index (BI) has been presented in Table 3 for a clear understanding of the comparative barriers faced by the respondents on the statements of each aspect. Results indicate that the respondents showed the highest concern on the statements like ‘limitations of technical support from organization’ (BI =421) in case of organizational barriers, ‘there is a lack of skills to use ICT’ (BI =442) in case of personal barriers, ‘low computer literacy level in agriculture community’ (BI =397) in case of technological barriers and ‘lack of strategic vision in development e-learning’ (BI =365) in case of policy barriers.

**Relationship between the selected characteristics of the respondents and extent of barriers faced**

Findings on correlation analysis between the selected characteristics of the respondents and their extent of faced barriers indicate that out of nine selected

Table 3

Rank order of the statements regarding barriers across four dimensions based on their mean index

Statements		Extent of opinion					MI*	Rank
		SA*	A	UD	DA	SDA		
<b>Organizational barriers</b>								
1.	Limitations of technical support from organization	42	28	17	3	0	421	1
2.	Lack of training to learn ICT	26	36	22	3	2	392	2
3.	Lack of interest by top managers and extension experts to use ICT	30	27	13	20	0	375	3
4.	Unfamiliar of top manager with ICT applications	18	34	28	10	0	367	4
5.	Lack of awareness in availability of ICT	12	33	27	17	1	342	5
<b>Personal barriers</b>								
1.	There is a lack of skills to use ICT	51	29	7	3	0	442	1
2.	Require new knowledge to use ICT	39	24	19	9	2	392	2
3.	Lack of confidence in ability to use ICT	29	28	13	18	2	372	3
4.	Language problems towards using ICT	16	26	27	20	1	341	4
5.	Time management problems in learning to use ICT	6	24	32	25	3	308	5

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Technological barriers								
1.	Low computer literacy level in agriculture community	34	28	21	5	2	397	1
2.	Lack of appropriate hardware and software	31	27	11	20	1	374	2
3.	The limitation of virtual training for operational techniques	18	32	21	16	3	351	3
4.	Poor infrastructure development in agriculture sector	22	27	12	24	5	344	4
5.	Weak telecommunication systems and old telephone lines	18	27	20	19	6	335	5
Policy barriers								
1.	Lack of strategic vision in development e-learning	26	26	22	13	3	365	1
2.	The existing government policies and regulations about ICT are shaky	18	39	12	20	1	358	2
3.	Budget in the availability of ICT in agriculture sector are limited	27	18	18	26	1	349	3
4.	Lack of appropriate rules for using e-learning	13	32	24	20	1	340	4
5.	Law related to ICT policies in agriculture sector are not supportive	13	19	40	17	1	329	5

MI= Mean Index, SA= Strongly Agree, A= Agree, UD=Undecided, DA= Disagree SDA= Strongly Disagree

characteristics of the respondents training exposure, innovativeness, job satisfaction, cosmopolitanism, use of information sources and knowledge on ICT showed negative significant relationship with their faced barriers (Table 4). It was found that training exposure showed negative significant relation with their barriers. This implies that barriers decrease with the increasing training exposure. Training facilities can play an important role to change behavior by increasing knowledge, skill and attitude of the respondents. It may be concluded that unless the training exposure of the respondents are increased they will continue to face barriers towards ICT utilization which was similar to those of Ali and Magalhaes (2008). Innovativeness of the respondents had significant negative relationship with their faced barriers. This indicates that barriers decrease with their increasing innovativeness. Innovativeness of an individual helps to adopt new ideas and technology. Job satisfaction of the respondents showed significant negative relationship with their faced barriers. This indicates barriers decrease with their increasing job satisfaction. Annor-frempong et al. (2006) found the same results in their studies.

Cosmopolitanism of the respondents has significant negative relationship with their perceived barriers. Through cosmopolitanism quality an individual becomes aware of the recent information. Probably due to low cosmopolitanism the respondents faced more barriers. The use of information source is one of the main important components to aware agricultural extension workers in respect of various agricultural development issues. Soekartawi (2005) found that the cosmopolitanism of the agricultural

**Table 4**  
Relationship between selected characteristics of the respondents and their extent of faced barriers towards ICT utilization

Selected personal attributes	Co-efficient of correlation (r)
Age	0.158 <sup>NS</sup>
Service experience	0.089 <sup>NS</sup>
Training exposures	-0.388 <sup>**</sup>
Innovativeness	-0.488 <sup>**</sup>
Job satisfaction	-0.426 <sup>**</sup>
Cosmo politeness	-0.233 <sup>*</sup>
Use of information sources	-0.252 <sup>*</sup>
Aspiration	0.055 <sup>NS</sup>
Knowledge	-0.315 <sup>**</sup>

\* Correlation is significant at the 0.05 level (2-tailed)

\*\* Correlation is significant at the 0.01 level (2-tailed).

extension worker had negative significant relationship with implementing 'e-learning'. Use of information sources of the respondents showed negative significant relationship with their faced barriers. This hints that the respondents having higher use of information sources faced lower barriers. Knowledge of the respondents has significant negative relationship with their faced barriers. Knowledge of any individual increases his/her awareness, mental alertness makes him/her familiar or acquaint with facts, objects, concepts, or practices. It may be concluded that unless the knowledge of the respondents are increased they will continue to face barriers towards ICT utilization. These findings are supported by those of Mungania (2003).

**Dimensions of preparedness**

The preparedness of the agricultural extension workers towards ICT utilization were conceptualized

as consisting of four dimensions. These dimensions included: i) farmers’ preparedness ii) personal preparedness iii) infrastructure preparedness and iv) management preparedness. For each dimensions of preparedness the respondents’ actions were arbitrarily judged from low to high preparedness continuum. The salient features of different components have been presented in Table 5.

**Table 5**  
Salient features of the different dimensions of preparedness of the respondents towards ICT utilization

Dimensions of preparedness	Observe score range (Possible range: 1-25)	PI*	Rank
Management preparedness	11-25	228.9	1
Infrastructure preparedness	10-22	181.0	2
Personal preparedness	10-23	165.7	3
Farmers’ preparedness	08-18	132.2	4

PI= Preparedness Index

Findings contained in Table 5 show that the preparedness of the respondents towards ICT utilization in agriculture management preparedness was relatively higher compare to other three dimensions and of them farmers’ preparedness was the lowest. The respondents’ categorizations according to preparedness score of all four dimensions have been presented in Table 6.

**Farmers’ preparedness**

Findings contained in the Table 6 show that cent percent of the respondents in the study area perceived low to medium preparedness. Reason behind this might be due to most of the farmer’s having poor skill to use ICT and they are not able to read and learn or follow the direction in a mobile phone and computer screen to accomplish a task.

**Table 6**  
Distribution of the respondents according to their preparedness in four dimensions

Dimensions	Category	Respondents		Mean	SD
		No.	Percent		
Farmers preparedness	Low (up to 15)	61	67.8	14.6	2.01
	Medium (16-20)	29	32.2		
	High (>20)	0	0		
Personal preparedness	Low (up to 15)	33	36.7	16.08	2.53
	Medium (16-20)	55	61.1		
	High (>20)	2	2.2		
Infrastructure preparedness	Low (up to 15)	29	32.3	17.06	3.11
	Medium (16-20)	49	54.4		
	High (21-25)	12	13.3		
Management preparedness	Low (up to 15)	11	12.2	19.18	2.86
	Medium (16-20)	42	46.7		
	High (21-25)	37	41.1		

**Personal preparedness**

This aspect considers the individual’s state of mind as it

impacts the outcome of the e-learning initiative. This is considered one of the most important factors and has the highest possibility of sabotaging the utilization process. Information presented in Table 6 indicate that all most all of the respondents (97.8%) had low to medium preparedness towards ICT utilization. Because most of the respondents were not experienced about technology based training (i.e. computer, multimedia based training etc) and they had no enough ICT competency to prepare learning material in the study area.

**Infrastructure preparedness**

Infrastructure preparedness is the state of being prepared of the basic physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function. It can be generally defined as the set of interconnected structural elements that provide framework supporting an entire structure of development and implementation process. This aspect greatly affects ICT implementation. Results displayed in the Table 6 indicate that big mass of the respondents (86.7%) had low to medium infrastructure preparedness towards ICT utilization. Because the technical support was not adequate to support ICT and the infrastructure in agricultural department were not ready for integrating ICT in extension program.

**Management preparedness**

Management preparedness is the state of being prepared of organizational process that includes strategic planning, setting; objectives, managing resources, deploying the human and financial assets needed to achieve objectives, and measuring results. Results presented in Table 6 indicate that a very big mass of the respondents (92.8%) had medium to high management preparedness towards ICT utilization. The reason behind this might be the most of the senior extension officer knows what is ICT and they think positively towards technological invention in daily task.

**Overall preparedness of the respondents**

The preparedness scores of the respondents ranged from 39 to 88 against the possible range of 1 to 100, with an average 66.94. Findings contained in Figure 2 indicate that the highest proportion (66.7%) of the respondents had medium preparedness compared to 22.2 percent low and 11.1 percent high preparedness towards ICT utilization.

Therefore, majority (88.9%) of the respondents

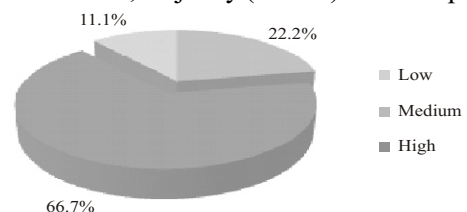


Figure 2. Distribution of respondents according to their overall preparedness towards ICT utilization

had low to medium preparedness towards ICT implementation in agriculture.

**Rank order of the statements of preparedness across four dimensions**

A rank order of the statements in four dimensions regarding preparedness towards ICT utilization according to their Mean Preparedness Index (PI) has been also presented in Table 7. Findings indicate that the respondents showed top most concern

on the statements like ‘the farmers know that ICT can be used as a learning tool’ (PI=362) in case of farmers preparedness, ‘I know how ICT can be used as a learning tool’ (PI=394) in case of personal preparedness, ‘the infrastructure in agricultural department can support ICT implementation’ (PI=391) in case of infrastructure preparedness and ‘my senior officer knows what is ICT’ (PI=427) in case of management preparedness.

**Table 7**  
**Rank order of the statements regarding preparedness of the respondents across four dimensions based on their mean index**

Statements		Extent of opinion					MI*	Rank
		SA*	A	UD	DA	SDA		
<b>Farmers preparedness</b>								
1.	The farmers know that ICT can be used as a learning tool	14	44	16	16	0	362	1
2.	The farmers are capable of managing their time in order to use ICT	3	12	44	22	9	275	3
3.	The farmers have enough skills to use ICT	2	6	21	49	12	230	5
4.	The farmer posses the basic mobile phone skill (such as using help line, receiving and dialing call etc)	16	37	15	21	1	350	2
5.	The farmer are able to read and follow the direction in a mobile phone and computer screen to accomplish a task	0	18	20	33	19	240	4
<b>Personal preparedness</b>								
1.	I know how ICT can be used as a learning tool	27	40	14	9	0	394	1
2.	I think ICT is helpful in improving extension and learning	21	43	15	10	1	381	2
3.	I am ready to integrate ICT utilities in my exten sion program	7	29	23	30	1	312	3
4.	I have enough ICT competency to prepare learning materials	7	11	13	26	33	225	5
5.	I am experienced about computer, multimedia based training etc	4	37	11	27	11	295	4
<b>Infrastructure preparedness</b>								
1.	The infrastructure in agricultural department can support ICT utilization	38	26	8	16	2	391	1
2.	The technical support is adequate to support ICT	7	32	12	28	11	295	5
3.	The agricultural department can afford the budget to use ICT in extension & learning	18	37	11	19	5	348	3
4.	The infrastructures in agricultural department are ready for integrating ICT in extension program.	10	32	12	30	6	311	4.
5.	The agricultural department has a cultures of sharing and team work to use ICT	21	38	11	14	6	360	2
<b>Management preparedness</b>								
1.	My senior officer knows what is ICT	46	32	3	9	0	427	1
2.	My senior officer supports the use of ICT	36	38	9	7	0	414	2
3.	The agricultural department has a plan for ICT implementation in the coming future	17	31	7	28	7	325	5
4.	High level manger think po sitively towards the technological invention in daily task	34	35	1	14	6	385	3
5.	Any change that required the use of technology in daily tasks has been accepted by the majority of high level manager.	24	36	6	23	1	365	4

MI=Mean Index, SA= Strongly Agree, A= Agree, UD=Undecided, DA= Disagree SDA= Strongly Disagree



**Relationship between the selected characteristics of the respondents and extent of their preparedness**

Co-efficient of correlation (r) was used to explore the relationship between the selected characteristics of the respondents and their preparedness. The summary of the result of correlation test is presented in Table 8.

**Table 8**  
**Relationship between selected characteristics of the respondents and their perceived preparedness towards ICT utilization**

Selected personal attributes	Co-efficient of correlation (r)
Age	0.152 <sup>NS</sup>
Service experience	0.162 <sup>NS</sup>
Training exposures	0.543 <sup>**</sup>
Innovativeness	0.230 <sup>*</sup>
Job satisfaction	0.242 <sup>*</sup>
Cosmo politeness	0.253 <sup>*</sup>
Source of information	0.222 <sup>*</sup>
Aspiration	0.197 <sup>NS</sup>
Knowledge on ICT	0.568 <sup>**</sup>

\* Significant at 0.05 level of probability,

\*\* Significant at 0.01 level of probability, NS = Non significant

Findings reveal that out of nine selected characteristics of the respondents training exposure, innovativeness, job satisfaction, cosmopoliteness, use of information sources and knowledge on ICT showed positive significant relationship with their preparedness. Training exposure was significantly and positively related to their preparedness. This implies that that more training exposure of the respondents leads to a tendency towards more preparedness towards ICT utilization in agriculture. Training facilities can play an important role to change behavior by increasing knowledge, skill and attitude of the respondents. This result was supported by Krull (2003). Innovativeness of the respondents was significant positive relationship with their preparedness. This indicates that preparedness increase with their increasing innovativeness. Innovativeness of an individual helps to adopt new ideas and technology. The positive significant correlation of job satisfaction of the respondents with their preparedness clearly pointed out that an individual with more job satisfaction leads to a tendency towards more preparedness towards ICT utilization in agriculture. Purnomo et al. (2010) found the same results in their studies. Cosmopoliteness of the respondents has significant positive relationship with their preparedness. Through cosmopoliteness quality, an individual becomes aware of the recent information. Probably due to low cosmopoliteness the respondents faced more barriers. The use of information source is

one of the main important components to aware agricultural extension workers in respect of various agricultural development issues. So and Swatman (2006) found similar results in their study. Use of information sources of the respondents showed significant positive relationship with their preparedness indicating that respondents having higher contact with source of information more likely to have more preparedness towards ICT utilization in agriculture. Knowledge of the respondents has significant positive relationship with their preparedness. This indicates that preparedness increase with their increasing knowledge. Knowledge of any individual increases his/her awareness, mental alertness makes him/her familiar or acquaint with facts, objects, concepts, or practices. It may be concluded that unless the knowledge of the respondents are increased they will continue to face barriers towards ICT utilization. This findings were supported by those of Trinidad (2002).

**Variation of preparedness of agricultural extension workers according to their knowledge on ICT**

ANOVA was performed in order to examine the variation of preparedness towards ICT utilization of agricultural extension workers with their knowledge on ICT. Findings presented in Table 9 clue that the extent of preparedness towards ICT utilization of agricultural extension workers differs in their knowledge levels. It also hints that the respondents having higher (mean = 68.48) and medium (mean = 67.81) knowledge levels on ICT had comparatively more exposure to ICT utilization than those of low.

**Table 9**  
**Variation of preparedness of agricultural extension workers according to their knowledge on ICT**

Category of Knowledge of agricultural extension workers	Mean	SD	%CV	F-statistic
Low knowledge	60.86	4.312	7.08	10.935** (p= 0.000)
Medium Knowledge	67.81	5.452	8.04	
High knowledge	68.48	5.565	8.12	
Total (n=90)	66.94	5.94	8.87	

\*\* Indicating significant at 0.01 level (2 tailed) with 89 degrees of freedom

**Factors influencing preparedness of agricultural extension workers towards ICT utilization**

Multiple regression analysis was employed to determine the contribution of the independent variables to the dependent variable. Step-wise regression analysis was employed for determining the contribution of the independent variables individually and jointly on the changes in dependent variable. Out of nine variables the regression coefficient of only four variables viz. innovativeness, cosmopoliteness, job satisfaction and knowledge on ICT had significant

contribution to the preparedness towards ICT utilization of the respondents (Table 10). The other five variables had no significant contribution to the same.

**Table 10**  
**Regression coefficients of preparedness of the respondents with their selected characteristics in the general linear model procedure**

Selected characteristics of the respondents	Unstandardized coefficients		Standardized coefficients	t	Sig.
		Std. Error			
Constant	66.167	12.046		5.493	0.000
Age	-.045	.432	-.050	-.103	0.918
Service experience	-.190	.451	-.199	-.421	0.675
Training	-.756	.384	-.185	-1.968	0.053
Innovativeness	.427	.104	.505	4.109	0.000
Cosmopolitaness	.754	.137	.559	5.509	0.000
Job satisfaction	.400	.102	.452	3.926	0.000
Source of information	.154	.115	.134	1.344	0.183
Knowledge of ICT	.568	.180	.253	3.161	0.002
Aspiration	.155	.165	.074	.939	0.350

$R^2 = 0.597$ , Adjusted  $R^2 = 0.552$ ,  $F = 13.177$

The  $R^2$  value is 0.597 and corresponding F value is 13.77 which is significant at 0.000 level. The  $R^2$  value indicating that 59.7 percent of the total variation in the preparedness towards ICT utilization of the respondents was explained by the four variables included in the regression analysis. However, it was possible that the proper contribution of the factors could not be expressed because of the internal correlation among the variables. Therefore, it was decided to run a stepwise multiple regression analysis and the findings are presented in the Table 11. It was observed that out of nine variables, only four variables

the regression model which combined account for 54.5 percent of the total variation in preparedness towards ICT utilization of the respondents. The F value was 25.496 which is significant at 0.000 level. In view of the significant contributions of the above mentioned four factors to the variation in preparedness of the agricultural extension workers towards ICT utilization, researcher rejected the concern null hypotheses and concluded that the each of the four factors had significant effect on ‘preparedness’ of the agricultural extension workers.

The unique contribution of each four variables

**Table 11**  
**Regression coefficients of preparedness of the respondents with their selected characteristics**

Selected characteristics of the respondents	Unstandardized coefficients		Standardized coefficients	t	Sig.
		Std. Error			
Constant	65.841	2.564		25.682	.000
Innovativeness	0.385	0.087	0.455	4.419	.000
Cosmopolitaness	0.762	0.124	0.564	6.152	.000
Job satisfaction	0.392	0.095	0.442	4.121	.000
Knowledge of ICT	0.561	0.176	0.250	3.192	.002

$R^2 = 0.545$ , Adjusted  $R^2 = 0.524$ ,  $F = 25.496$

**Table 12**  
**Changes in multiple  $R^2$  for enter of a variable into the step-wise multiple regressions for agricultural extension workers preparedness towards ICT utilization**

Model	Independent variables	$R^2$ value	$R^2$ change	Variance Explaining (percent)
1	Innovativeness	0.193	0.193	19.3
2	Cosmopolitaness	0.408	0.215	21.5
3	Job satisfaction	0.491	0.083	8.3
4	Knowledge of ICT	0.545	0.054	5.4

was also determined by taking the changes in R2 value occurred for entry of a particular variable in the step-wise regression model. The results are shown in Table 12.

The four variables together could explain 54.5 percent of the total variation in the preparedness of the respondents and the rest 45.5 remain unexplained. Innovativeness alone contributed 19.3 percent of the variation followed by cosmopolitanism 21.5 percent, job satisfaction 8.3 per cent and knowledge of ICT 5.4 percent of the variation in preparedness towards ICT utilization of the agricultural extension workers.

### CONCLUSION

Based on the major findings of the study, it can be concluded that more than fourth fifth of the respondents encountered medium to high barriers towards ICT utilization. This might be due to the fact that a considerable proportion of the SAAOs had not enough training exposure, and had moderate usages of source of information and medium knowledge of ICT. The comparative barriers perceived by the respondents

towards ICT utilization in agriculture, organizational barrier was relatively higher compare to other three dimensions. Reason behind that might be due to lack of training to learn ICT and limitations of technical support from the organization. Big majority of the respondents had low to medium preparedness towards ICT utilization. The comparative preparedness of the respondents towards ICT utilization in agriculture, management preparedness was relatively higher compare to other three dimensions. The respondents could have higher training exposure, innovativeness, job satisfaction, cosmopolitanism, use of information sources and knowledge of ICT, had higher preparedness towards ICT utilization; and respondents' innovativeness, cosmopolitanism, job satisfaction and knowledge on ICT would be to contribute significantly in their preparedness towards ICT utilization.

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