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ICT - As a tool in Agricultural Sustainability for Tribal Women Empowerment in Meghalaya State

Shri Richards Lyngkhoi*

ABSTRACT

ICTs are as an instrument for progress and development has been widely acknowledged in this 'Global Information age', and it has been observed that people with all walks of life are being impacted by the IT sector directly or indirectly. Among other ICTs, mobile telephony has emerged as the technology of choice of the majority of the urban and even the rural masses (Ansari and Pandey, 2013). The possession of mobile phones particularly has become a necessity in the contemporary society irrespective of age, status, profession, income groups or place of residence. As such, mobile phones have been regarded as the widely accessed tool among the farmers for communication and also accessing agriculture-related information particularly for the marketing of produce (Chhachar et al., 2014). In this context, mobile technologies can offer the means for development in developing countries (Rashid and Elder, 2009). ICTs, therefore, offer opportunities to reach more people through easy access to local or global information and knowledge. Hence, with the new emerging paradigm of agricultural development, old ways of delivering important services to citizens are being challenged; traditional societies are also being transformed into knowledge societies all over the world which makes people living in the villages think and do things differently (Meera et al., 2004). This paper tries to explore the availability and uses of Information and Communication Technology in the field of agriculture among the tribal women living in West Khasi Hills District of Meghalaya.

Keywords: Access, Availability and usage of ICT and Empowerment

INTRODUCTION

ICT or Information and Communications Technology in simple terms, can be defined as the basket of technologies, which assist or support in storage, processing of Data/Information, or in dissemination/ communication of Data/Information, or both. ICT thus includes technologies such as desktop and laptop computers, software, peripherals and connection to the Internet that are intended to fulfill information processing and communication functions (Kumar R et. al, 2017). With regard to agriculture and rural development occupying an important place in the economy of Meghalaya, the researcher has attempted to study the level of accessibility, availability, usage of ICTs and also the problems faced by the farmers in accessing ICTs. (Syiem R and R Saravanan, 2015). ICT includes computer, internet, phone, Television, radio, and other offline and online communication devices (Hasan, 2007). Many authors have advocated a focused approach in understanding the impact of ICT for rural development or the effects of ICT on the processes through which people were working (Gomez, R.1999, UN 2006, Madon, S 2005, Montealegre, R.1999, Walsham, G. 2006)

*Research Scholar, DACE, NEHU, Shillong.

(Hasan et. al, 2009). It is usual to have a strategic planning before implementing any technology. The strategic planning for the selection of suitable and effective ICT for agricultural information and dissemination should include the information or contents that farmers seek for. Strategic planning of ICT implementation includes decision making about the most suitable form of implementing e-learning on different levels (Divjak & Begcevic, 2006). Agriculture Information and Communication Center (under Ministry of Agriculture Development, Nepal) in their Organizational Objective have stated "To fulfill the information needs of agricultural practitioners and farm communities through the use of modern information and communication technology" as one of their strategy for agricultural information dissemination. But the strategic plan of implementing ICT as a medium is vague in the actual practice as there are many factors or criterion which needs consideration before decision making. Radio and television still dominates the ICT usage for information dissemination. While information supporting agriculture production and processes is provided by different government organizations, NGO, INGO and private organizations in Nepal, the farmers are not being able to exploit the advantages of ICT for information access. Learning new techniques and more profitable agricultural production methods through using ICT tools may encourage farmers to adapt their practices and to improve their agricultural processes. Disseminating agricultural information effectively to farmers in formats that they find easy to use will be a suitable approach for this study. In order to do so, research activities including data collection, data analysis, framework development and actual field implementation are necessary. (Bohara A, 2014).

NEED AND JUSTIFICATION OF THE STUDY

A number of factors point to the threat of exclusion of the poor in the current information revolution. With the exception of mobile phones, the gap in the provision of new ICTs is much larger within and among countries than income disparities. Benefiting from ICT requires complementary investments and skills, including literacy. Threshold effects are also at work: network externalities, scale economies, lack of local content in local languages, fragmented markets for software applications, and high cost of access for remote areas—factors that lead to or reinforce poverty traps and economic isolation for poor communities and poor countries. Poor and disadvantaged groups, particularly women, often face special constraints in accessing ICT and using them for their specific needs. The risks of economic exclusion suggest that countries should be concerned with the level of connectivity and ICT provision—and with enabling access and deploying ICT and content in ways that expand relevant information for the poor, increase their voice in decision making and address bottlenecks to their trade.

REVIEW OF RELATED LITERATURE

Agriculture being the primary sector is regarded as the backbone of the Indian economy. Around 56.6 per cent of the Indian population depends on agriculture for their livelihood (GOI, 2011). Agricultural growth is therefore, essential for fostering economic development and feeding the growing population (Datt and Ravallion, 1996). However, one component which can boost agricultural production is the contribution of information and knowledge for agriculture extension. Agricultural extension depends to a large extent on information exchange (Mabe and Oladele, 2012). ICTs therefore can be used as a medium in bridging the information gap. There is also a growing recognition of farmers of rural communities realizing the importance of knowledge, information and adoption of appropriate learning methods (Greenridge, 2003, Lightfoot, 2003). Therefore, in order to benefit the rural people, extensionists are grappling with the question of how to harness ICTs to improve rural livelihoods in order to contribute towards better information exchange and access. In

s regard, extension practitioners are also interested in experimenting with innovative extension iatives (Saravanan, 2010).

ESEARCH DESIGN

The present study based on a total of 760 respondents (workers and non-workers tribal women) tributed equally among the three tribal sub-groups i.e Maram, Lyngam and Garo living in West asi and South West Khasi Hills District of Meghalaya. The total number of female workers and nale non-workers in the Districts as per Census Report 2011 were 1, 67,976. The total female rkers were 67,439 and the total female non-workers were 100537. The total numbers of female ltivators were 39,669, female agricultural labourers were 16,503, Household Industry workers re 1,353 and other workers were 9,914. For the purpose of the study, all the female workers re categorized as cultivators, agricultural labourers, household Industry workers, other workers d non-workers comprise the universe of the study.

TATEMENT OF THE PROBLEM

On the basis of the above justification, the study is entitled as "***ICT-As a tool in agricultural stainability for tribal women empowerment in Meghalaya State***".

ELIMITATION OF THE STUDY

1. The study will be delimited to the three major tribal communities (Maram, Lyngam and Garo women) in the age group of 18-45 years of age.
2. The study will be delimited to female workers and female non-workers residing in West Khasi Hills District and South West Khasi Hills District.

BJECTIVES

1. To measure the level of access, availability and usage of ICT in agriculture among tribal women.

ESEARCH QUESTIONS

1. To what extent the level of access, availability and usage of ICT are used by tribal women for agriculture purpose?

YPOTHESIS

1. There exist no significant differences in the level of access, availability and usage of ICT by different groups for agriculture.

ESEARCH METHODOLOGY

A Universe: The table 1.1 shows the universe of the study

Table 1.1: Universe of the Study

District/Block	No of Villages	Total Female Workers	Female Cultivators	Female Agricultural Labourers	Female Household Industry Workers	Female other Workers	Female Non Workers
WKHD							
Mawshynrut	318	14439	9219	2728	298	2194	21970
Nongstoin	238	11528	7611	2680	243	994	14787
Mawthadraishan	104	10744	6426	2643	149	1526	13648
Mairang	144	14317	8382	4557	93	1285	19446
SWKHD							
Ranikor	161	6292	2867	1054	237	2134	13665
Mawkyrwat	140	10119	5164	2841	333	1781	17021
TOTAL	**1105**	**67439**	**39669**	**16503**	**1353**	**9914**	**100537**

Source: Census Data, 2011

Sample: The table 1.2 shows the sample of the study.

Table 1.2: Sample of the Study

District/ Block	No of villages	Total Female Workers	Female Cultivators	Female Agricultural Labourers	Female Household Industry Workers	Female other Workers	Female Non Workers
WKH							
Mawshynrut	30	150	60	30	30	30	150
Nongstoin	25	125	45	30	25	25	125
SWKH							
Mawkyrwat	15	105	30	30	30	15	105
TOTAL	**70**	**380**	**135**	**90**	**85**	**70**	**380**

Multistage random sampling method shall be adopted by the investigator for drawing sample from the universe. In the first stage, out of four blocks of West Khasi Hills District, two block at random and out of two blocks of South West Khasi Hills District, one block at random was drawn by the investigator. In the second stage, approximately 10% of the villages would be drawn from the selected blocks using proportionate sampling method. In the third stage from each village, 10 respondents shall be drawn at random having equal representation from female workers and female non workers. Thus the total number of female workers and female non workers would be 760. The female workers include the cultivators, agricultural labourers, household industry workers and other workers.

ANALYSIS & INTERPRETATION OF DATA

Table 1.1: Availability of ICTs in at home.

Sl. No.	Availability of ICTs in your home.	Maram (N=256)		Lyngam (N=252)		Garo(N=252)		Total	
		Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1	Mobile phones	244 (95.31)	12 (4.69)	238 (94.44)	14 (5.56)	234 (92.86)	18 (7.14)	716 (94.21)	44 (5.79)
2	T.V	164 (64.06)	92 (35.94)	163 (64.68)	89 (35.32)	169 (67.06)	83 (32.94)	496 (65.26)	264 (34.74)
3	Radio	120 (46.88)	136 (53.13)	117 (46.43)	135 (53.57)	113 (44.84)	139 (55.16)	350 (46.05)	410 (53.95)
4	A.T.M	21 (8.20)	235 (91.80)	18 (7.14)	234 (92.86)	19 (7.54)	233 (92.46)	58 (7.63)	702 (92.37)
5	Internet	35 (13.67)	221 (86.33)	29 (11.51)	223 (88.49)	33 (13.10)	219 (86.90)	97 (12.76)	663 (87.24)
6	Personal Computer	5 (1.95)	251 (98.05)	8 (3.17)	244 (96.83)	6 (2.38)	246 (97.62)	19 (2.50)	741 (97.50)
7	Laptop	6 (2.34)	250 (97.66)	5 (1.98)	247 (98.02)	6 (2.38)	246 (97.62)	17 (2.24)	743 (97.76)
8	Facebook	23 (8.98)	233 (91.02)	21 (8.33)	231 (91.67)	22 (8.73)	230 (91.27)	66 (8.68)	694 (91.32)
9	Camera	15 (5.86)	241 (94.14)	13 (5.16)	239 (94.84)	14 (5.56)	238 (94.44)	42 (5.53)	718 (94.47)
10	You tube	5 (1.95)	251 (98.05)	6 (2.38)	246 (97.62)	5 (1.98)	247 (98.02)	16 (2.11)	744 (97.89)
Total of (N)		256		252		252		760	

The Table 1.1 shows availability of ICTs in households of the respondents. It is seen from the data that 95.31% respondents belonging from Maram Tribes, 94.44% from Lyngam Tribes and 92.86% from Garo Tribes are in possession of mobile phones. Similarly 64.06% from Maram Tribes, 64.68% from Lyngam Tribes and 67.06% from Garo Tribes are having television sets in their house. With regards to radio, it was seen that 46.88% of Maram, 46.43% of Lyngam and 44.84% of Garo have radio sets to listen. On the other hand, 8.20% from Maram Tribes, 7.14% from Lyngam Tribes and 7.54% from Garo Tribes have ATM card with them. With respect to internet connections, 13.67% from

Maram Tribes, 11.51% from Lyngam Tribes and 13.10% from Garo Tribes have internet connections. As regards to Personal Computer 1.95 % from Maram Tribes, 3.17 % from Lyngam Tribes and 2.38 % from the Garo Tribes have personal computer in their possession. However 2.34% from Maram Tribes, 1.98 % from Lyngam Tribes and 2.38 % from Garo Tribes have Laptop with them. With regard to Face Book accounts, only 8.98% Maram Tribes, 8.33% Lyngam Tribes and 8.73% Garo Tribes have their face book accounts. On the other hand only 5.86% of Maram Tribes, 5.16% of Lyngam Tribes and 5.56% of Garo Tribes have digital camera and 1.95% of Maram Tribes, 2.38 % of Lyngam Tribes and 1.98 % of Garo Tribes have accessibility to You Tube.

Table 1.2: Access to ICTS Equipments

2	Items of ICT equipments	Maram (N=256)		Lyngam (N=252)		Garo (N=252)		Total	
HARDWARE		Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1	Mobile phones	211 (82.42)	45 (17.58)	198 (78.57)	54 (21.43)	195 (77.38)	57 (22.62)	604 (79.47)	156 (20.53)
2	T.V	157 (61.33)	99 (38.67)	159 (63.10)	93 (36.90)	163 (64.68)	89 (35.32)	479 (63.03)	281 (36.97)
3	Radio	103 (40.23)	153 (59.77)	105 (41.67)	147 (58.33)	101 (40.08)	151 (59.92)	309 (40.66)	451 (59.34)
4	ATM	17 (6.64)	239 (93.36)	16 (6.35)	236 (93.65)	15 (5.95)	237 (94.05)	48 (6.32)	712 (93.68)
5	Computer	5 (1.95)	251 (98.05)	6 (2.38)	246 (97.62)	5 (1.98)	247 (98.02)	16 (2.11)	744 (97.89)
6	Camera	11 (4.30)	245 (95.70)	10 (3.97)	242 (96.03)	11 (4.37)	241 (95.63)	32 (4.21)	728 (95.79)
SOFTWARE									
7	Internet	28 (10.94)	228 (89.06)	25 (9.92)	227 (90.08)	28 (11.11)	224 (88.89)	81 (10.66)	679 (89.34)
8	Facebook	18 (7.03)	238 (92.97)	17 (6.75)	235 (93.25)	16 (6.35)	236 (93.65)	51 (6.71)	709 (93.29)
9	Youtube	5 (1.95)	251 (98.05)	5 (1.98)	247 (98.02)	4 (1.59)	248 (98.41)	14 (1.84)	746 (98.16)
Total of (N)		256	100.00	252	100.00	252	100.00		

The Table 1.2 shows access of ICTs equipments in households of the respondents. It is seen from the data that 82.42% respondents belonging from Maram Tribes, 78.57% fromLyngam Tribes

and 77.38% from Garo Tribes were access to mobile phones. Similarly 61.33% from Maram Tribes, 63.10% from Lyngam Tribes and 64.68% from Garo Tribes have access to Television. With regards to radio, it was seen that 40.23% of Maram Tribes, 41.67% of Lyngam Tribes and 40.08% of Garo Tribes have access to radio. On the other hand, 6.64% from Maram Tribes, 6.35% from Lyngam Tribes and 5.95% from Garo Tribes have access to ATM card. With respect to Personal Computer only 1.95% from Maram Tribes, 2.38% from Lyngam Tribes and 1.98% from the Garo Tribes have access to personal computer. However 4.30% from Maram Tribes, 3.97% from Lyngam Tribes and 4.37% from Garo Tribes have access to camera. With regard to internet access, only 10.94% Maram Tribes, 9.92% Lyngam Tribes and 11.11% Garo Tribes have internet access. On the other hand only 7.03% of Maram Tribes, 6.75% of Lyngam Tribes and 6.35% of Garo Tribes have access to facebook and 1.95% of Maram Tribes, 1.98% of Lyngam Tribes and 1.59% of Garo Tribes have accessibility to You Tube.

Table 1.3: ICT initiatives helping the agricultural communities

Sl. No.	ICTs help in Easier and faster communication	Maram		Lyngam		Garo		Total	
		Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1	With family and friends	91 (35.55)	165 (64.45)	88 (34.92)	164 (65.08)	85 (33.73)	167 (66.27)	264 (34.74)	496 (65.26)
2	With working colleagues	13 (5.08)	243 (94.92)	11 (4.37)	241 (95.63)	13 (5.16)	239 (94.84)	37 (4.87)	723 (95.13)
3	Enhance education	83 (32.42)	173 (67.58)	85 (33.73)	167 (66.27)	84 (33.33)	168 (66.67)	252 (33.16)	508 (66.84)
4	Enhance business	25 (9.77)	231 (90.23)	21 (8.33)	231 (91.67)	22 (8.73)	230 (91.27)	68 (8.95)	692 (91.05)
5	Helped in farming	77 (30.08)	179 (69.92)	72 (28.57)	180 (71.43)	69 (27.38)	183 (72.62)	218 (28.68)	542 (71.32)
Total of (N)		256		252		252			760

With regard to ICT help in easier and faster communication with family and friends, there were 35.55 percent respondents of Maram Tribes, 34.92 percent respondents of Lyngam Tribes and 33.73 percent respondents of Garo Tribe. With respect to ICT help in easier and faster communication with working colleagues, there were 5.08 percent respondents of Maram Tribes, 4.37 percent respondents of Lyngam Tribes and 5.16 percent respondents of Garo Tribe. With regard to ICT help in easier and faster communication in Enhance education, there were 32.42 percent respondents of Maram Tribes, 33.73 percent respondents of Lyngam Tribes and 33.33 percent respondents of Garo Tribe. With respect to ICT help in easier and faster communication in Enhance business, there were 9.77 percent respondents of Maram Tribes, 8.33 percent respondents of Lyngam Tribes and 8.73 percent respondents of Garo Tribe. With regard to ICT help in easier and faster communication Helped in farming, there were 30.08 percent respondents of Maram Tribes, 28.57 percent respondents of Lyngam Tribes and 27.38 percent respondents of Garo Tribe.

Sl. No.	Items	Tribe	Mobile phone			TV			Radio		
			Yes (%)	No (%)	NA (%)	Yes (%)	No (%)	NA (%)	Yes (%)	No (%)	NA (%)
1	Market Information	Maram (N=256)	89 (34.77)	155 (60.55)	12 (4.69)	68 (26.56)	170 (66.41)	18 (7.03)	21 (8.20)	136 (53.13)	99 (38.67)
		Lyngam (N=252)	87 (34.52)	151 (59.92)	14 (5.56)	66 (26.19)	161 (63.89)	25 (9.92)	22 (8.73)	95 (37.70)	135 (53.57)
		Garo (N=252)	81 (32.14)	153 (60.71)	18 (7.14)	67 (26.59)	166 (65.87)	19 (7.54)	21 (8.33)	92 (36.51)	139 (55.16)
2	Production input	Maram (N=256)	88 (34.38)	156 (60.94)	12 (4.69)	58 (22.66)	180 (70.31)	18 (7.03)	24 (9.38)	133 (51.95)	99 (38.67)
		Lyngam (N=252)	83 (32.94)	155 (61.51)	14 (5.56)	52 (20.63)	175 (69.44)	25 (9.92)	23 (9.13)	94 (37.30)	135 (53.57)
		Garo (N=252)	79 (31.35)	155 (61.51)	18 (7.14)	53 (21.03)	180 (71.43)	19 (7.54)	22 (8.73)	91 (36.11)	139 (55.16)
3	Advice	Maram (N=256)	75 (29.30)	169 (66.02)	12 (4.69)	61 (23.83)	177 (69.14)	18 (7.03)	22 (8.59)	135 (52.73)	99 (38.67)
		Lyngam (N=252)	71 (28.17)	167 (66.27)	14 (5.56)	59 (23.41)	168 (66.67)	25 (9.92)	21 (8.33)	96 (38.10)	135 (53.57)
		Garo (N=252)	71 (28.17)	163 (64.68)	18 (7.14)	58 (23.02)	175 (69.44)	19 (7.54)	20 (7.94)	93 (36.90)	139 (55.16)
4	Loan service	Maram (N=256)	79 (30.86)	165 (64.45)	12 (4.69)	66 (25.78)	172 (67.19)	18 (7.03)	25 (9.77)	132 (51.56)	99 (38.67)
		Lyngam (N=252)	74 (29.37)	164 (65.08)	14 (5.56)	63 (25.00)	164 (65.08)	25 (9.92)	25 (9.92)	92 (36.51)	135 (53.57)
		Garo (N=252)	75 (29.76)	159 (63.10)	18 (7.14)	62 (24.60)	171 (67.86)	19 (7.54)	24 (9.52)	89 (35.32)	139 (55.16)
5	Agriculture productions	Maram (N=256)	89 (34.77)	155 (60.55)	12 (4.69)	61 (23.83)	177 (69.14)	18 (7.03)	24 (9.38)	133 (51.95)	99 (38.67)
		Lyngam (N=252)	87 (34.52)	151 (59.92)	14 (5.56)	59 (23.41)	168 (66.67)	25 (9.92)	23 (9.13)	94 (37.30)	135 (53.57)
		Garo (N=252)	87 (34.52)	147 (58.33)	18 (7.14)	58 (23.02)	175 (69.44)	19 (7.54)	22 (8.73)	91 (36.11)	139 (55.16)

6	*Post harvest management*	*Maram (N=256)*	72	172	12	59	179	18	39	118	99
			(28.13)	(67.19)	(4.69)	(23.0.5)	(69.92)	(7.03)	(15.23)	(46.09)	(38.67)
		Lyngam (N=252)	71 (28.17)	167 (66.27)	14 (5.56)	57 (22.62)	170 (67.46)	25 (9.92)	37 (14.68)	80 (31.75)	135 (53.57)
		Garo (N=252)	69 (27.38)	165 (65.48)	18 (7.14)	56 (22.22)	177 (70.24)	19 (7.54)	35 (13.89)	78 (30.95)	139 (55.16)
7	Entrepreneurs information sharing	Maram (N=256)	91 (35.55)	153 (59.77)	12 (4.69)	61 (23.83)	177 (69.14)	18 (7.03)	28 (10.94)	129 (50.39)	99 (38.67)
		Lyngam (N=252)	87 (34.52)	151 (59.92)	14 (5.56)	58 (23.02)	169 (67.06)	25 (9.92)	27 (10.71)	90 (35.71)	135 (53.57)
		Garo (N=252)	85 (33.73)	149 (59.13)	18 (7.14)	55 (21.83)	178 (70.63)	19 (7.54)	25 (9.92)	88 (34.92)	139 (55.16)
8	Disease control	Maram (N=256)	88 (34.38)	156 (60.94)	12 (4.69)	67 (26.17)	171 (66.80)	18 (7.03)	31 (12.11)	126 (49.22)	99 (38.67)
		Lyngam (N=252)	83 (32.94)	155 (61.51)	14 (5.56)	66 (26.19)	161 (63.89)	25 (9.92)	30 (11.90)	87 (34.52)	135 (53.57)
		Garo (N=252)	81 (32.14)	153 (60.71)	18 (7.14)	68 (26.98)	165 (65.48)	19 (7.54)	28 (11.11)	85 (33.73)	139 (55.16)
	Weather information	Maram (N=256)	64 (25.00)	180 (70.31)	12 (4.69)	88 (34.38)	150 (58.59)	18 (7.03)	39 (15.23)	118 (46.09)	99 (38.67)
		Lyngam (N=252)	59 (23.41)	179 (71.03)	14 (5.56)	85 (33.73)	142 (56.35)	25 (9.92)	37 (14.68)	80 (31.75)	135 (53.57)
		Garo (N=252)	54 (21.43)	180 (71.43)	18 (7.14)	83 (32.94)	150 (59.52)	19 (7.54)	35 (13.89)	78 (30.95)	139 (55.16)
10	Business opportunity	Maram (N=256)	71 (27.73)	173 (67.58)	12 (4.69)	77 (30.08)	161 (62.89)	18 (7.03)	28 (10.94)	129 (50.39)	99 (38.67)
		Lyngam (N=252)	68 (26.98)	170 (67.46)	14 (5.56)	72 (28.57)	155 (61.51)	25 (9.92)	26 (10.32)	91 (36.11)	135 (53.57)
		Garo (N=252)	63 (25.00)	171 (67.86)	18 (7.14)	69 (27.38)	164 (65.08)	19 (7.54)	25 (9.92)	88 (34.92)	139 (55.16)

The above 1.4 table shows purpose of usage of ICT Equipments.

With regards to respondents who use Mobile phone in Market information there were 34.77 percent Maram Tribes, 34.52 percent Lyngam Tribes and 32.14 percent Garo Tribes. With respect to respondents who use Television in Market information there were 26.56 percent Maram Tribes, 26.19 percent Lyngam Tribes and 26.59 percent Garo Tribes. As regard to respondents who use Radio in Market information there were 8.20 percent Maram Tribes, 8.73 percent Lyngam Tribes and 8.33 percent Garo Tribes. As regards to respondents who use Mobile phone in Production input there were 34.38 percent Maram Tribes, 32.94 percent Lyngam Tribes and 31.35 percent Garo Tribes.

With respect to respondents who use Television in Production input there were 22.66 percent Maram Tribes, 20.63 percent Lyngam Tribes and 21.03 percent Garo Tribes. With respect to respondents who use Radio in Production input there were 9.38 percent Maram Tribes, 9.13 percent Lyngam Tribes and 8.73 percent Garo Tribes. With regards to respondents who use Mobile phone in Advice there were 29.30 percent Maram Tribes, 28.17 percent Lyngam Tribes and 28.17 percent Garo Tribes.

With respect to respondents who use Television in Advice there were 23.83 percent Maram Tribes, 23.41 percent Lyngam Tribes and 23.02 percent Garo Tribes. As regard to respondents who use Radio in Advice there were 8.59 percent Maram Tribes, 8.33 percent Lyngam Tribes and 7.94 percent Garo Tribes. As regards to respondents who use Mobile phone in Loan service there were 30.86 percent Maram Tribes, 29.37 percent Lyngam Tribes and 29.76 percent Garo Tribes.

With respect to respondents who use Television in Loan service there were 25.78 percent Maram Tribes, 25.00 percent Lyngam Tribes and 24.60 percent Garo Tribes. With respect to respondents who use Radio in Loan service there were 9.77 percent Maram Tribes, 9.92 percent Lyngam Tribes and 9.52 percent Garo Tribes.

With regards to respondents who use Mobile phone in Agriculture productions there were 34.77 percent Maram Tribes, 34.52 percent Lyngam Tribes and 34.52 percent Garo Tribes. With respect to respondents who use Television in Agriculture productions there were 23.83 percent Maram Tribes, 23.41 percent Lyngam Tribes and 23.02 percent Garo Tribes. As regard to respondents who use Radio in Agriculture productions there were 9.38 percent Maram Tribes, 9.13 percent Lyngam Tribes and 8.73 percent Garo Tribes.

With regards to respondents who use Mobile phone in Post harvest management there were 28.13 percent Maram Tribes, 28.17 percent Lyngam Tribes and 27.38 percent Garo Tribes. With respect to respondents who use Television in Post harvest management there were 23.05 percent Maram Tribes, 22.62 percent Lyngam Tribes and 22.22 percent Garo Tribes. As regard to respondents who use Radio in Post harvest management there were 15.23 percent Maram Tribes, 14.68 percent Lyngam Tribes and 13.89 percent Garo Tribes.

As regards to respondents who use Mobile phone in Entrepreneurs information sharing there were 35.55 percent Maram Tribes, 34.52 percent Lyngam Tribes and 33.73

percent Garo Tribes. With respect to respondents who use Television in Entrepreneurs information sharing there were 23.83 percent Maram Tribes, 23.02 percent Lyngam Tribes and 21.83 percent Garo Tribes. With respect to respondents who use Radio in Entrepreneurs information sharing there were 10.94 percent Maram Tribes, 10.71 percent Lyngam Tribes and 9.92 percent Garo Tribes.

With respect to respondents who use Mobile phone in Disease control there were 34.38 percent Maram Tribes, 32.94 percent Lyngam Tribes and 32.14 percent Garo Tribes. With respect to respondents who use Television in Disease control there were 26.17 percent Maram Tribes, 26.19 percent Lyngam Tribes and 26.98 percent Garo Tribes. With respect to respondents who use Radio in Disease control there were 12.11 percent Maram Tribes, 11.90 percent Lyngam Tribes and 11.11 percent Garo Tribes.

As regards to respondents who use Mobile phone in Weather information there were 25.00 percent Maram Tribes, 23.41 percent Lyngam Tribes and 21.43 percent Garo Tribes. With respect to respondents who use Television in Weather information there were 34.38 percent Maram Tribes, 33.73 percent Lyngam Tribes and 32.94 percent Garo Tribes. With respect to respondents who use Radio in Weather information there were 15.23 percent Maram Tribes, 14.68 percent Lyngam Tribes and 13.89 percent Garo Tribes.

With regards to respondents who use Mobile phone in Business opportunity there were 27.73 percent Maram Tribes, 26.98 percent Lyngam Tribes and 25.00 percent Garo Tribes. With respect to respondents who use Television in Business opportunity there were 30.08 percent Maram Tribes, 28.57 percent Lyngam Tribes and 27.38 percent Garo Tribes. As regard to respondents who use Radio in Business opportunity there were 10.94 percent Maram Tribes, 10.32 percent Lyngam Tribes and 9.92 percent Garo Tribes.

Table 1.5: Service requirement from Existing Information Center

Sl. No.	Required Services	Maram		Lyngam		Garo		Total	
		Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)	Yes (%)	No (%)
1	Agricultural Information	13 (5.08)	243 (94.92)	15 (5.95)	237 (94.05)	16 (6.35)	236 (93.65)	44 (5.79)	716 (94.21)
2	Educational information related to agriculture	14 (5.47)	242 (94.53)	13 (5.16)	239 (94.84)	11 (4.37)	241 (95.63)	38 (5.00)	722 (95.00)
3	Business information related to agriculture	10 (3.91)	246 (96.09)	8 (3.17)	244 (96.83)	11 (4.37)	241 (95.63)	29 (3.82)	731 (96.18)
4	Soil/Water test related to agriculture	9 (3.52)	247 (96.48)	10 (3.97)	242 (96.03)	8 (3.17)	244 (96.83)	27 (3.55)	733 (96.45)
5	E-mail/Internet services related to agriculture	**14 (5.47)**	**242 (94.53)**	**12 (4.76)**	**240 (95.24)**	**15 (5.95)**	**237 (94.05)**	41 (5.39)	719 (94.61)
6	Commercial phone service related to agriculture	15 (5.86)	241 (94.14)	13 (5.16)	239 (94.84)	16 (6.35)	236 (93.65)	44 (5.79)	716 (94.21)
7	Photography related to agriculture	13 (5.08)	243 (94.92)	14 (5.56)	238 (94.44)	15 (5.95)	237 (94.05)	42 (5.53)	718 (94.47)
8	Government forms related to agriculture	**15 (5.86)**	**241 (94.14)**	**16 (6.35)**	**236 (93.65)**	**15 (5.95)**	**237 (94.05)**	46 (6.05)	714 (93.95)
9	Market and Price information related to agriculture	13 (5.08)	243 (94.92)	11 (4.37)	241 (95.63)	14 (5.56)	238 (94.44)	38 (5.00)	722 (95.00)
10	Computer training	11 (4.30)	245 (95.70)	10 (3.97)	242 (96.03)	12 (4.76)	240 (95.24)	33 (4.34)	727 (95.66)
11	Poultry Cultivation	9 (3.52)	247 (96.48)	8 (3.17)	244 (96.83)	10 (3.97)	242 (96.03)	27 (3.55)	733 (96.45)
12	Fish Cultivation	6 (2.34)	250 (97.66)	7 (2.78)	245 (97.22)	8 (3.17)	244 (96.83)	21 (2.76)	739 (97.24)
	Total of (N)	256		252		252			

The above table 1.5 shows Service requirement from Existing Information Center.

With regard to Service requirement from Existing Information Center in Agricultural information, there were 5.08 percent respondents of Maram Tribes, 5.95 percent respondents of Lyngam Tribes and 6.35 percent respondents of Garo Tribe. With regard to Service requirement from Existing Information Center in Educational information related to agriculture, there were 5.47 percent respondents of Maram Tribes, 5.16 percent respondents of Lyngam Tribes and 4.37 percent respondents of Garo Tribe.

With respect to Service requirement from Existing Information Center in Business information related to agriculture, there were 3.91percent respondents of Maram Tribes, 3.17 percent respondents of Lyngam Tribes and 4.37 percent respondents of Garo Tribe. With regard to Service requirement from Existing Information Center in Soil/Water test related to agriculture, there were 3.52 percent respondents of Maram Tribes, 3.97 percent respondents of Lyngam Tribes and 3.17 percent respondents of Garo Tribe.

With respect to Service requirement from Existing Information Center in E-mail/Internet services related to agriculture, there were 5.47 percent respondents of Maram Tribes, 4.76 percent respondents of Lyngam Tribes and 5.95 percent respondents of Garo Tribe. With regard to Service requirement from Existing Information Center in Commercial phone service related to agriculture, there were 5.86 percent respondents of Maram Tribes, 5.16 percent respondents of Lyngam Tribes and 6.35 percent respondents of Garo Tribe. With respect to Service requirement from Existing Information Center in Photography related to agriculture, there were 5.08 percent respondents of Maram Tribes, 5.56 percent respondents of Lyngam Tribes and 5.95 percent respondents of Garo Tribe. With regard to Service requirement from Existing Information Center in Government forms related to agriculture,

there were 5.86 percent respondents of Maram Tribes, 6.35 percent respondents of Lyngam Tribes and 5.95 percent respondents of Garo Tribe.

As regard to Service requirement from Existing Information Center in Market and Price information related to agriculture, there were 5.08 percent respondents of Maram Tribes, 4.37 percent respondents of Lyngam Tribes and 5.56 percent respondents of Garo Tribe. With respect to Service requirement from Existing Information Center in Computer Training related to agriculture, there were 4.30 percent respondents of Maram Tribes, 3.97 percent respondents of Lyngam Tribes and 4.76 percent respondents of Garo Tribe. As regard to Service requirement from Existing Information Center in Poultry Cultivation, there were 3.52 percent respondents of Maram Tribes, 3.17 percent respondents of Lyngam Tribes and 3.97 percent respondents of Garo Tribe. With respect to Service requirement from Existing Information Center in Fish Cultivation, there were 2.34 percent respondents of Maram Tribes, 2.78 percent respondents of Lyngam Tribes and 3.17 percent respondents of Garo Tribe.

MAIN FINDING

The following are the main findings of the study:

1. It was found from the data that 94.21 percent of the respondents have mobile phones in their possession, 65.26% respondents have Television set at home, 46.05% respondents have radio at home, 7.63% respondents have ATM, 12.76% respondents used internet, 0.26% respondents have personal computer at home, 0.39% respondents have laptop at their home, 8.68% respondents used facebook account, 5.53% respondents have camera and 1.45% respondents used YouTube..
2. It was found from the data that 94.21 percent of the respondents have access to mobile phones, 65.26% respondents have access to Television, 46.05% respondents have access to radio, 7.63% respondents have access to ATM, 0.26% respondents have access to personal computer, 5.53% respondents have access to camera, 12.76% respondents have

internet access, 8.68% respondents have access to facebook account, 5.53% respondents have access to YouTube.

3. It was found that most respondents used Mobile phone, Radio and Television for ICT information.
4. It was found that there were 5.92 percent respondents, who received Agricultural information from Agricultural Information center, 6.45 percent respondents, who received Health & environmental information from Agricultural Information center, 5.00 percent respondents, who received Educational information from Agricultural Information center, 3.82 percent respondents, who received Business information from Agricultural Information center, 3.42 percent respondents, who received soil and water test from Agricultural Information center, 5.79 percent respondents, who received Email/Internet service from Agricultural Information center, 6.32 percent respondents, who received commercial phone service from Agricultural Information center, 5.26 percent respondents, who received photography from Agricultural Information center, 6.32 percent respondents, who received Government forms from Agricultural Information center, 5.00 percent respondents, who received Market and price information from Agricultural Information center, 4.87 percent respondents, who received Computer Training from Agricultural Information center, 4.34 percent respondents, who received Help line from Agricultural Information center, 4.08 percent respondents, who received Videos services from Agricultural Information center, 8.16 percent respondents, who received Typing of documenrs from Agricultural Information center, and 8.16 percent respondents, who received Music from Agricultural Information center.
5. It was found that there were 5.79 percent respondents, who required services in Agricultural information from Existing Information center, 5.00 percent respondents who required services in Educational information related to agriculture from Existing Information center, 3.82 percent respondents who required services in Business information related to agriculture from Existing Information center, 3.55 percent respondents who required services in Soil/ Water test related to agriculture from Existing Information center, 5.39 percent respondents who required services in E-mail/Internet services test related to agriculture from Existing Information center, 5.79 percent respondents who required services in Commercial phone service test related to agriculture from Existing Information center, 5.53 percent respondents who required services in Photography related to agriculture from Existing Information center, 6.05 percent respondents who required services in Government form related to agriculture from Existing Information center, 5.00 percent respondents who required services in Market and Price information form related to agriculture from Existing Information center, 4.34 percent respondents who required services in Computer training related to agriculture from Existing Information center, 3.550 percent respondents who required services in Poultry cultivation from Existing Information center, and 2.76 percent respondents who required services in Fish cultivation from Existing Information center.

SUGGESTION

1. Without infrastructure of electricity and telecommunication, ICT can do very little and rarely at the village level in Meghalaya. They also are dependent on the skills and capacity necessary to use, manage and maintain the technology effectively. Matching the most appropriate communications technology with people's needs and capabilities is a crucial task for ICT providers.
2. Dissemination of agriculture-related information through F.M radio programmes would be recommended so that it will disseminate to rural remote tribal areas.

3. Better infrastructural facilities in Common Service Centres should be improved with prominent locations for farmers to be easily accessible.
4. More awareness-cum-training programmes on ICTs should be encouraged among farmers by agricultural State Departments, Research Organizations and its allied Departments in order to increase the confidence, competence and skill in using ICTs for development.
5. Use of renewable energy such as solar panels would be recommended in order to overcome erratic and fluctuating power supply in the state particularly in rural areas.
6. Increased engagement in social media among rural youths on farming in order to enhance the communication pattern among themselves and extension personnel.
7. Since there is lack of repairing centres of ICTs at the village level, vocational training for the youths on ICT infrastructure would be recommended.
8. There are various technical challenges which are significantly influenced the use of ICTs in disseminating agricultural information. At the same time, the Institutional support is also necessary for enabling ICT user's farmers in increasing productivity.
9. Farmers should refer to ICT offices where they live and represent specification of their products so that office operators register the information after they enter the rural office site. They would send products through that office and the post after customer purchase and receiving orders.
10. The adoption of computer technology to enhance the flow of information to farmers is seen as a vital tool to allow farmers remain competitive on a global stage.
11. Agricultural information processing and communication systems need to be developed to provide a new platform for storing and sharing knowledge to farmers in convenient and semi-automatic way using simple and low cost mobile phones.

CONCLUSION

The adoption of ICTs to enhance the flow of information to tribal women in the field of agriculture is seen as a vital tool for their empowerment. What is clear from this paper is that a core group of tribal women have embraced ICT and are benefiting from its adoption. However, it is essential that barriers to the adoption of ICT by other tribal people who are not using it are overcome. Efforts must be made to focus all players within the agricultural industry to make ICTs more relevant to farmers. The transformation which has taken place in Indian agriculture due to e-Government has been remarkable with the facilities to interact with the Ministry of Agriculture on a number of schemes for farmers. This development is welcome and must continue. However, one area where Government has not been so successful is in broadband provision to rural areas, where the farming communities are concentrated. Today, there is a major imbalance in the provision of broadband to urban and rural areas with many rural areas trailing in ICT penetration. The commitment given by Government to extend the benefits of the Information Society to all parts of the country including farming communities and the rural population must be delivered. Broadband is now accepted as vital to rural sustainable development and without it farmers cannot make full use of ICT. Finally, it is evident that there is a desire among farmers to embrace ICT but without the necessary skills to do so, this will not happen. If farmers are to adopt ICT on a grand scale it will only happen if they are taught the skills which they can implement immediately in relation to their farming businesses. While agribusinesses themselves may not want to get involved directly in training, it is important that they is a need for supportive organisations in local areas in delivering the type of training required by farmers.

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