

Usage of Information and Communication Technologies among Agrarian Youths of Manipur, India

**Mayanglambam Victoria Devi^{1*}, Loukham Devarani¹, R. J. Singh¹
and L. Hemochandra¹**

¹College of Post Graduate Studies in Agricultural Sciences, Central Agricultural University (Imphal),
Umiam-793103, Meghalaya, India.

Authors' contributions

This work was carried out in collaboration among all authors. Authors MVD and LD designed the study, wrote the protocol, performed the statistical analysis, managed the analyses of the study and wrote the first draft of the manuscript. Authors RJS and LH supervised the work, managed the literature searches and edited the manuscript. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/CJAST/2019/v38i630391

Editor(s):

(1) Dr. Teresa De Pilli Assistant Professor, Department of Science of Agriculture of Food of Environment (SAFE), University of Foggia, Via Napoli, Italy.

Reviewers:

(1) Olutosin A. Otegunrin, Federal University of Agriculture, Nigeria.

(2) Altaf Hossain, Soil Resource Development Institute, Bangladesh.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/52898>

Original Research Article

Received 20 September 2019

Accepted 26 November 2019

Published 28 November 2019

ABSTRACT

The present study aimed at analysing the usage of ICTs by the agrarian youths of state Manipur, India. The locale of study was Imphal-West district of Manipur, from where 120 respondents have been randomly selected from six villages of the two sub-divisions viz., Patsoi and Wangoi. The study delved into examining whether the socio-economic profiles of youths have any significant dependence with the utilization of different ICT tools viz., Radio, T.V., Mobile Phone, PC/Laptop, Internet and Information Kiosk. The major findings of the analysis reveal that 'Attitude towards ICTs' has significant dependence at 5% level of significance with the utilization of Radio. The variable 'Education' has significant dependence with the utilization of television at 10% level of significance. The utilization of PC/laptop by respondents had significant dependence with 'Education', 'Attitude towards ICTs', 'Cosmopolitaness' and 'Social participation' at 1% level of significance. With respect to utilization of Internet by agrarian youths, the variables, namely 'Education', 'Attitude towards ICTs', 'Cosmopolitaness' and 'Social Participation' have significant

*Corresponding author: E-mail: mvictoria.cau@gmail.com;

dependence at 1% level of significance. Pertaining the utilization of information kiosks by respondents, the variable 'Age' has significant dependence at 1% level of significance. Lack of infrastructural facilities to access ICTs was the most profound constraints faced by agrarian youths of Manipur.

Keywords: ICTs; youths; utilization; agrarian; constraints.

1. INTRODUCTION

There has been cosmic change in the development of the country with the intervention of Information and Communication Technologies (ICTs). Today without the use of ICTs, a society would fall behind in the path of development [1]. ICTs help people to communicate effectively, overcoming the limitations of time and space, empower people by providing information and knowledge, provide income generating and learning opportunities, increase government transparency and efficiency, and enables people to express their concerns and to actively participate in decision-making processes [2]. ICTs have a vital role in connecting the rural community to outside world for exchange of information, a basic necessity for economic development. Technological progress, infrastructures deployment coupled with falling prices have brought unexpected growth in ICTs access and connectivity to billions of people around the world. It has been reported by International Telecommunication Union (ITU) that over 2.7 billion people in the world are using internet and 6.8 billion people subscribe mobile [3]. The global trends in ICTs growth also indicated that there is an increased penetration in mobile cellular telephone subscriptions and number of individuals using the internet while the number of fixed telephone subscriptions is declining from 2001 till 2013. In India, according to Telecom Regulatory Authority of India [4] in the month of January, 2017 the number of active wireless subscribers was 1005.16 million. India is the second country in the world in terms of mobile subscribers with 85.21% of the population having mobile phones while it holds a third position in the world with a total of 137 million number of internet users [5]. In India besides the modern ICTs, the old ICTs viz., telephone and T.V. also had an increasing trend among the household while radio had a declining trend. This indicates that the use of ICTs are increasing and gaining importance in the lives of the people to further contribute to development and better communication.

Although young and old alike watch T.V. and listen to the radio, young people are the main

users of the new ICTs, especially the internet and more advanced features of mobile phones. Young people are more likely to adopt these new technologies for economic, physiological, and social reasons. Youths are the most energetic and most sensitive stage of man's life. They are more concern about their career and for their community. But they are most vulnerable to unemployment, corruption, insurgence, intoxicants and lack of access to information. For rural youths who are the pillars on which rural development and ultimately development of the nation rest, the ICTs have an important role in fostering the process.

According to Census of State Manipur [6] 50.00% of rural households have radio/transistor, 36.70% rural household have T.V., 48.90% of rural household have telephone, 5.60% rural household have computer/laptop without internet, 1.10% rural household have computer/laptop with internet, 2.40% rural household have land line only, 44.70 % rural household have mobile only and 1.70% rural household have both land line and mobile. There are 399 Common Service Centres at village level to provide improved information services to the rural population.

In Manipur, there were 10,650 internet users and 2,65,240 mobile phone users [7]. Broadband internet connectivity in Manipur is quite good both 3G and EVDO, mobile broadband facilities are also available all over Manipur. Users don't have multiple connectivity options as there are only a very few companies offering internet services in the state [8].

Youths constitute of 19.922% of its population in Manipur [9]. However, the youths of Manipur are looming under the peril of unemployment, lack of job skills and skill based job, corruption, disturbance in education, insurgence etc. Going by the reviews, use of ICTs can be a source of information so as to improve and facilitate the youths for self-development, community development and development of the nation as a whole. Considering the various issues on development of agrarian youths, it is imperative to understand the usage of ICTs and the constraints face by them.

2. MATERIALS AND METHODS

2.1 Sampling

The study was conducted at Imphal-West district of the state Manipur, which is having the highest household ownership of ICTs asset in rural households. Out of four administrative sub-divisions of Imphal-West district, the two sub-divisions viz., Patsoi and Wangoi sub-divisions have been selected for study based on criterion sampling procedure, considering the highest agrarian household ownership of ICTs asset. Subsequently, from each sub-division, three villages were selected randomly and hence, a total of six villages were finalized in the study. Considering the equivalent population prevailing in the selected villages and due economy of time in study, equal allocation of sample size in all the selected villages have been observed, thereby 20 agrarian youths who are in the range of 18 to 35 years from each village comprising of 10 male and 10 female were selected randomly in order to constitute a total sample size of 120 respondents for the research work.

2.2 Research Hypotheses

The research considers the following eight variables viz., 'Age', 'Education', 'Family Size', 'Annual Family Income', 'Attitude towards ICTs', 'Cosmopolitanness', 'Social Participation' and 'Achievement Motivation' as independent variables; and 'Utilization of different ICTs tool' as dependent variable. Following null and alternate hypotheses have been poised in discourse.

H_0 : The independent variables are independent from the dependent variable.

H_1 : The independent variables have significant dependence with the dependent variable.

2.3 Analytical Tools

2.3.1 The Chi-square (χ^2) test of independence

The χ^2 test of independence was used to determine statistical independence between dependent and independent variables using the following formula-

$$\chi^2 = \sum \frac{(o-e)^2}{e}$$

where,

O = Observed value

e = Expected value

Cramer's V statistic was used to express the effect size. The formula is given below:

$$V = \frac{\sqrt{\chi^2}}{\sqrt{(n)(L-1)}}$$

Where,

χ^2 = Chi-square test statistic

n = Total number in the sample

L = Minimum value of the row and column total from the contingency table.

2.3.2 Garrett's ranking technique

The Garrett's Ranking Technique was employed for evaluating the constraints faced by respondents using the following formula:

$$\text{Percent position} = 100 (R_{ij} - 0.5) / N_j$$

Where,

R_{ij} = Rank given for i^{th} constraint by j^{th} respondents.

N_j = Number of constraint ranked by j^{th} respondents

3. RESULTS AND DISCUSSION

3.1 Statistical Distribution of Independent and Dependent Variables

3.1.1 Independent variables

The characteristic of Independent variables for the study on agrarian youths is depicted in Table 1.

The average age of the youths for the study was found 24.68 years. Majority of youths (45.00%) have Education level of Under Graduate and belong to medium family size i.e., 4 to 9 members. Majority of youths have medium annual family income (64.17%) ranging Rs. 85 ('000) to Rs. 4, 50 ('000), have moderate favourable attitude towards ICTs (77.50%), medium cosmopolitanness (69.16%) i.e., visit to the nearest town in last one year, medium social participation (75.83%) and have medium achievement motivation (70.00%).

3.1.2 Dependent variable

The study considers the utilization of following ICT tools viz., Radio, T.V. (Television), Mobile Phone, PC/Laptop, Internet and Information

Kiosk as depicted in Fig. 1. It could be lucidly reported that highest of 53.33% of rural youths were found using Mobile Phone very frequently. Similarly, 24.16%, 10.83%, 10.00%, 3.33% and 3.33% of respondent have utilized very frequently the Internet, T.V., PC/Laptop, Information Kiosk and Radio. Syiem [10] and Hassan *et al.* [11] have also report of similar findings in their study.

3.2 Chi-Square (χ^2) Test of Independence between Independent Variables with Dependent Variable Pertaining to ICT Tools

The statistical *Chi-square (χ^2) Test of Independence* between independent variables with dependent variable along with Cramer's V pertaining to ICT tools is depicted in Table 2.

Radio: The study observes significant dependence, accepting alternate hypotheses in the utilization of radio with the independent variables *viz.*, 'Attitude towards ICTs' and 'Cosmopolitaness' of youths at 5% and 10% level of significance respectively, with Cramer's V of 0.223 and 0.199 inferring low level of dependence. This may be due to only one way

communication of radio and no options for multimedia as that of other ICTs tool.

T.V. (Television): The study observes significant dependence, accepting alternate hypotheses in the utilization of T.V. with 'education' of the youths at 10% level of significance with Cramer's V of 0.232 inferring low level of significance. This may occurred due to limited accessibility and low information regarding education forecast at T.V.

Mobile Phone: The study observes significant dependence, accepting alternate hypotheses in the utilization of mobile phone with the independent variables *viz.*, 'education', 'attitude towards ICTs' and 'achievement motivation' at 5% level of significance and 'cosmopolitaness' and 'social participation' at 1% level of significance. The Cramer's V values for education and cosmopolitaness were 0.308 and 0.343 respectively inferring moderate level of significance. While, 'attitude toward ICTs', 'social participation' and 'achievement motivation' have Cramer's V of 0.257, 0.299 and 0.232 respectively inferring low level of dependent. Being mobile phone handy, easy to use and its fast two way communication facilities found beneficial and attracts the youths.

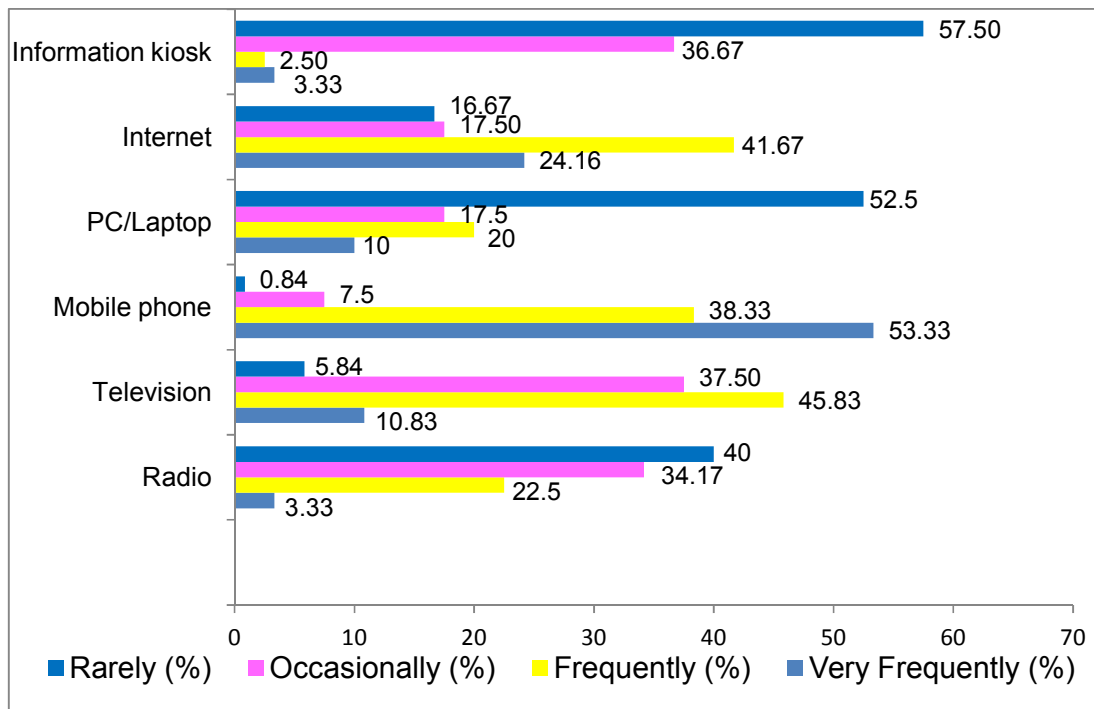


Fig. 1. Utilization of ICTs tool by respondents of study

Table 1. Characteristics of independent variables

Sl. No	Characteristics	Average	Male	Female
1.	Age (in years)	24.68	25.15	24.21
	Characteristics	Categories	Frequency	Percentage
2.	Education level	Primary	1	0.83
		Below X	6	5.00
		Up to X	14	11.67
		Up to XII	11	9.16
		Under Graduate	54	45.00
		Post Graduate	34	28.33
3.	Family size	Small (below 4)	10	8.33
		Medium (4-9)	104	86.66
		Large (above 9)	6	5.00
4.	Annual family Income	Low (below Rs.85000)	28	23.33
		Medium (Rs.85000 to 450000)	77	64.17
		High (above Rs.450000)	15	12.50
5.	Attitude towards ICTs	Low (below 25)	15	12.50
		Medium (25 to 36)	93	77.50
		High (above 36)	12	10.00
6.	Cosmopolitaness	Low (below 23)	18	15.00
		Medium (23 to 42)	83	69.16
		High (above 42)	19	15.83
7.	Social participation	Low (below 12)	17	14.10
		Medium (12 to 23)	91	75.83
		High (above 23)	12	10.00
8.	Achievement Motivation	Low (below 11)	15	12.50
		Medium (11 to 15)	84	70.00
		High (above 15)	21	17.50

Table 2. Chi-Square (χ^2) Test of Independence between independent variables with dependent variable pertaining to ICT tools

SI. No	Independent variables	Radio		T.V.		Mobile phone		PC/Laptop		Internet		Information Kiosk	
		P value	Cr's V	P value	Cr's V	P value	Cr's V	P value	Cr's V	P value	Cr's V	P value	Cr's V
1.	Age	0.464	0.153	0.346	0.147	0.111	0.180	0.103	0.184	0.003**	0.287	0.053***	0.215
2.	Education	0.296	0.210	0.096***	0.232	0.023**	0.308	0.001*	0.298	0.001*	0.460	0.036**	0.252
3.	Family size	0.626	0.125	0.393	0.150	0.860	0.094	0.703	0.114	0.069***	0.209	0.727	0.100
4.	Annual family income	0.663	0.122	0.425	0.151	0.167	0.183	0.002**	0.311	0.197	0.187	0.434	0.148
5.	Attitude towards ICTs	0.029**	0.223	0.144	0.193	0.003**	0.257	0.001*	0.342	0.001*	0.324	0.210	0.180
6.	Cosmopolitaness	0.086***	0.199	0.879	0.098	0.001*	0.343	0.001*	0.297	0.001*	0.430	0.345	0.171
7.	Social participation	0.723	0.118	0.498	0.142	0.001*	0.299	0.001*	0.335	0.001*	0.291	0.293	0.175
8.	Achievement motivation	0.149	0.181	0.757	0.119	0.034**	0.232	0.305	0.179	0.336	0.169	0.132	0.187

*NB: Cr's= Cramer's, *1% level of significance, **5% level of significance, ***10% level of significance*

PC/Laptop: The study observes significant dependence, accepting alternate hypotheses in the utilization of PC/laptop with the independent variables viz., 'education', 'attitude towards ICTs', 'cosmopolitaness' and 'social participation' at 1% level of significance and with annual family income at 5% level of significance. The Cramer's V values for 'education' and 'cosmopolitaness' were 0.298 and 0.297 respectively, While Cramer's V of 'annual family income', 'attitude towards ICTs' and 'achievement motivation' has 0.311, 0.342 and 0.335 respectively.

Internet: The study observes significant dependence, accepting alternate hypotheses in the utilization of internet with age of youths at 5% level of significance; with 'education', 'attitude towards ICTs', 'cosmopolitaness' and 'social participation' at 1% level of significance and with 'family size' of youths at 10% level of significance. The Cramer's V for 'age', 'family size' and 'social participation' were low with 0.287, 0.209 and 0.291 respectively. The Cramer's V of 'attitudes towards ICTs' with dependent variable was 0.324 While the Cramer's V for 'education' and 'cosmopolitaness' were high with 0.460 and 0.430 respectively. This is due to the variety of facilities and easy access of internet to the youths.

Information kiosk: The study observes significant dependence, accepting alternate hypotheses in the utilization of Information kiosk with 'age' and education at 1% and 5% level of significance respectively. The Cramer's V of 'age' and education were 0.215 and 0.252 respectively inferring low dependent.

4. CONSTRAINTS FACED BY RURAL YOUTHS IN THE USAGE OF ICTS

The study could identify ten important constraints faced by rural youths and are delineated in Table 3 mentioning the Garrett Mean score (GMS) values.

Lack of infrastructural facilities to access ICTs: Lack of infrastructural facilities to access ICTs is the most prioritized constraints reported by rural youths with the Garrett Mean score (GMS) of 80.87. Though ICTs tool were available in the rural villages, the operation qualities were found reported poor. Signal strength of the mobile phones were poor and sometimes not available, only few service providers were available that make youths of less option to access. The ICT infrastructure

facilities being found institutional level barrier in the study of Pandey et al. [12].

Poor connectivity of internet in rural areas: The rural youths also reported that the internet connections were very poor. Poor connectivity of internet in rural areas has GMS of 80.25 which mark of second most important constraint to the rural youths. Whenever they want to access, its poor signal strength makes them hamper in proper working on internet. Because of this low connectivity and limited to only few networks youths do not find the used of mobile phones and internet as reliable and credible. It acts as a barrier to their usage of ICTs. Constraints in the issue of connectivity reference to computers with internet have been also report by Kenny et al. [13].

Insufficient time to access and use ICTs: Most of the respondents in the study were student and busy at their day to day activity, they found less time to spend their time in accessing ICTs. Insufficient time to access and use ICTs has GMS of 78.34 and 3rd important constraint faced by the youths. Some respondent said that they do not get time to access and used ICTs and makes them away from the information and incidents around the world. They found themselves confined to some other activities of their course work, helping their parents at work and do not get sufficient time to access and used the ICTs. Prameela and Ravichandran [14] report of domestic responsibility making them busy as barrier for not using ICTs.

Low affordability and high cost of ICTs too: Respondent also report that ICTs asset are very costly and they couldn't afford them. Low affordability and high cost of ICTs tool has GMS of 70.93 and fourth constraint to the youths. Shortage in finance of the family referred as direct barrier in using ICTs to the rural youths. They couldn't recharge mobile phones and internet regularly as it charges very high. New ICTs assets are found very costly and they couldn't afford the prices. Almost similar problem of low affordability of ICT by the rural areas have been reported by Asian Development bank [15].

Erratic power supply in villages: Electricity was found one of the constraints that make hindrance in the usage of ICTs in rural areas. ICTs tool work with electricity, it is very much interrelated for the functioning of ICTs tool. But electricity is not regular in the selected villages. With the coming of the pre paid electricity

Table 3. Constraints in the usage of ICTs rural youths

SL. No.	Constraints	Garrett Mean Score (GMS)	Rank
1.	Lack of infrastructural facilities to access ICTs	80.87	I
2.	Poor connectivity of internet in rural areas	80.25	II
3.	Insufficient time to access and use ICTs	78.34	III
4.	Low affordability and high cost of ICTs tool	70.93	IV
5.	Erratic power supply in villages	70.89	V
6.	Frequent occurrence of Social Problems	70.81	VI
7.	Low ICTs literacy/ Information search and poor retrieval skills	69.03	VII
8.	Complexity of ICTs and low confidence in operating	66.70	VIII
9.	Lack of knowledge and awareness on ICTs and its applications	66.61	IX
10.	Problem of Language in handling ICTs tool	65.90	X

connection in the state some of the problems are solved to some extent. Even though they have pre paid facility, fluctuating and erratic power supply was reported by the respondents. Chilimo [16], Reddi & Sinha [17] and Sharma et al. [18] also identified erratic, inconsistent and fluctuating power supply as barrier in using ICTs in rural areas.

Frequent occurrence of Social Problems:

Respondent also report that social problems like issues of lack of governance misunderstanding within community etc. frequently occurred in the state creating chaos and leads frequent suspension of ICTs infrastructure. In order to avoid undesirable incidents there always shutdown of mobile and internet signals so as to control the spreading of message and viral on social media. During this period they couldn't connect others which are staying far and make them less connection with people and low access to information.

Low ICTs literacy/ Information search and poor retrieval skills:

ICTs have complexity and need users know how to operate them, it makes respondent difficult in handling it. For operating ICTs one should know 'how to' run ICTs and it makes hesitate to the users if they do not know how to operate. Information are over loaded in the web and searching the most relevant and necessary idea is found difficult for the respondent. They do not possess the retrieval skill of searching most suitable information they needed at the information flooded web. This is due to low awareness and low literacy about the ICTs and less exposure to the web. Khan [19] also report lack of computer literacy in using internet being major constraint to the respondents in his study at Punjab and Pakistan.

Complexity of ICTs and low confidence in operating:

Even though respondent owed ICTs

assets availing to them they find difficulty in handling them. ICTs tool are very high level technology one can't used it easily as they are mean for those who have better ideas and knowledge of how to handle them. They have fear of using high level ICTs as they are not confident in operating them due to limited option and exposure to ICTs. Syiem [10] also report almost similar constraint due to lack of confidence in operating and handling ICTs.

Lack of knowledge and awareness of opportunities and benefits of ICTs and its applications:

Respondent also mention that they have less knowledge about the new trend ICTs. They have those ICTs that are commonly known and available. They have limited assets availing to them and do not have much idea about opportunities and benefits of using ICT. Asian Development bank [15] also report of low awareness of opportunities and benefits of using ICTs and its application being major constraints to the rural areas.

Problem of Language in handling ICTs tool:

ICTs are mainly operating in English language. Some Respondent said that they faced language problem in using the ICTs. They found difficult to operate ICTs as they are not much understand to English. These lead to low usage of high and new trend technologies. Adhiguru and Devi [20] and Ajani and Agwu [21] also encounter lack of local language that creates language problem and barrier in the used of ICTs.

5. CONCLUSION

The ICTs are the most attractive assets to the youths which provides tremendous opportunities for agricultural development. Socio-economic characteristics of agrarian youths have played major roles in utilization of ICT tools. Initiatives to

bridge the gap between rural and urban and reaching to each and every remote corner to bring people in one platform through ICTs will definitely enhance agricultural and rural development. Apart from ICT infrastructural development at rural areas the connectivity of internet will remain an unavoidable initiative to close the rural and urban divide alongside dissemination of agricultural innovations to agrarian youths for advanced demand driven agriculture in villages.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Mulira H. The potential and feasibility for community driven ICT networks in Uganda: Minister for ICT; 2006. [Accessed 28 July 2016] Available: <http://www.wougnet.org/ICTpolicy/ug/docs/cinug.html>
2. UN (United Nations). Building e-Community Centre for Rural Development: Report of the Regional Workshop; 2004. [Accessed 23 August 2016] Available: <http://www.worldcat.org/title/building-ecomunity-centres-for-ruraldevelopment-report-of-the-regional-workshop-bali-indonesia-814december2004/oclc/61331088>.
3. ITU (International Telecommunication Union). ICTs facts and Figures. The World in; 2015.
4. TRAI (Telecom Regulatory Authority of India). Press release on telecom subscription data as on 31st January 2017. [Accessed 8 May 2017] Available: <http://www.Trai.gov.in/notifications/press-release/press-release-telecom-subscription-data-31st-january-2017>.
5. Sinha MK, Bhattacharjee S, Bhattacharjee S. A Study on ICT literacy and internet use pattern among college library users of Barak Valley, South Assam, North East India. *Curr. Trends Technol. Sci.* 2013; 2(5):301-316.
6. Gol (Government of India). Census of Manipur; 2013. [Accessed 13 July 2016] Available: http://Census_of_Manipur.communication_census_of_Manipur_household_amenities_and_assets_2011_download.
7. Biswas R. State wise Mobile Phone users in India Census; 2011. [Accessed 8 June 2016] Available: <http://updateox.com/india/state-wise-mobile-phone-users-in-india-census-2011/>.
8. Anonymous. Broadband Internet services in Manipur; 2013. [Accessed 8 June 2016] Available: <http://updateox.com/broadband/in-manipurupdateOX>.
9. UNFPA (United Nations Population Fund). Youths info Manipur. Youths info India; 2014. [Accessed 22 August 2016] Available: http://www.youthsinfolindia.org/profiles/files/profiles/en/1/Youths%20Info_Manipur_IND014.pdf.
10. Syiem R. Impact of ICTs in agriculture and rural development in Meghalaya. M. Sc. (Agric.), Thesis. Submitted to Central Agricultural University, Imphal; 2014.
11. Hassan MS, Hassan MA, Samah BA, Ismail N, Shafrill HAM. Use of Information and Communication Technology (ICT) among Agri – based Entrepreneurs in Malaysia. World Conference on Agricultural Information and IT. 2008;753-762.
12. Pandey DK, DEHK, Kumar P. e-Readiness of teachers in higher agricultural education of North eastern hill states of India. *Indian J Agric Sci.* 2019; 89(7):152-156.
13. Kenny C, Navas-Sabater J, Qiang CZ. ICT and poverty, World Bank, Washington, DC; 2000.
14. Prameela K, Ravichandran V. Socio-cultural barriers faced by farm women in the utilization of communication channel. *AgriculExten Review.* 2001;13(1):9-10.
15. Asian Development Bank. Building e-Community centers for rural development: Report of the regional workshop, Bali, Indonesia; 2004. [Accessed 15 November 2016] Available: <http://www.adbi.org/files/2004.12.08.cpp.proceedings.building.ecommunity.pdf>.
16. Chilimo WL. Information and communication Technologies and sustainable livelihoods: A case of selected rural areas of Tanzania. Unpublished PhD Thesis of University of Kwazulu-Natal, Pietermaritzburg, South Africa; 2008.
17. Reddi UV, Sinha V. ICT use in Education: National policies, strategies and

- programmes. UNESCO Meta-survey on the use of technologies in Education; 2009.
[Accessed 17September 2016]
Available:<http://unesco.org/images/0013/01349/134960e.pdf>.
18. Sharma M, Kaur G, Gill MS. Use of information and communication technology in Agriculture by farmers of Kapurthala District. *J KrishiVigyan Kendra*. 2012;1(1):82-89.
 19. Khan GA. Present and prospective role of electronic media in the dissemination of agricultural technologies among farmers of the Punjab, Pakistan. Ph.D., Thesis. Submitted to Department of Agricultural Extension, University of Agriculture, Faisalabad, Pakistan; 2010.
 20. Adhiguru P, Devi SV. ICT in Indian Agriculture: learning and a way ahead. *Int J ExtenEdu*. 2012;8(1):1-4.
 21. Ajani EN, Agwu AE. Information Communication Technology needs of small scale farmers in Anambra state, Nigeria. *J Agric Food Infor*. 2012;13(2): 144-156.

© 2019 *Devi et al.*; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/52898>