



# Impact Analysis of ICT on Women in Agriculture: A Study Conducted in Jorhat District of Assam, India

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.*

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## **ABSTRACT**

ICT led extension system is capable of changing farmers' lives by improving access to information and sharing knowledge through click of a button. Such approaches are far more important and essential for women farmers who are overburdened and hard pressed for time. Realizing the ever increasing role of women in agriculture and the need for empowering them in technological domain, the present study was conducted to study the level of knowledge of Farm Women Knowledge Group (FWKG) members on different aspects of selected ICT tool, to find out the level of use of ICT tool by the FWKG members and to study the impact of intervention programmes on knowledge and use of selected ICT tool among the FWKG members. Rural women having farming as an occupation were selected purposively. Six Farm Women Knowledge Group (FWKG) comprising ten

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members each were formed for the study. Intervention programmes were conducted for the members of FWKG including awareness programme, training and workshop which were home based, farm based and community based Programmes. The study reveals that post intervention levels of knowledge and use of selected ICT were better than pre intervention level among the FWKG members. High level of knowledge increased from 20.00 per cent to 48.33 per cent whereas low level of knowledge decreased from 45.00 per cent to 6.66 per cent. Similarly in case of high level of use increased from 6.66 per cent to 48.33 per cent. Knowledge and use of selected ICT tool was positively related in both pre and post-intervention phase. Paired 't' test implies that there was gain in knowledge after the intervention programmes. Similarly significant difference in use of selected ICT tool between the pre and post intervention was also found. It may be concluded that such interventions may increase the level of knowledge and use of selected ICT tool and such model may be replicated in other areas at micro level.

*Keywords: Impact; ICT tool; women in agriculture.*

## 1. INTRODUCTION

Agriculture is the major sector of Indian economy. The agriculture sector employs nearly half of the workforce in the country. However, it contributes to 19.9% of the GDP. Though agriculture is primary source of income for more than fifty per cent of people in India, it is still lagging behind in many aspects and characterized by small land holding, non or less adoption of improved technology, poor connectivity, disintegration of market, unreliable and delayed information to the farmers and several other factors. The present day digital revolution has changed the working of people including agriculture. Information and Communications Technologies (ICTs) may improve the lives of smallholder farmers in many ways, from monitoring crops to tracking market prices, enhanced on-farm productivity by reducing the constraints of extension and information, facilitating market transparency and improving logistics [1-3]. However, illiteracy, less wireless connectivity like telephone, less sharing of information among the farmers, limited time to use mass media sources significantly affect the awareness, utilization and perceived effectiveness of different communication sources [4]. Women play a fundamental role in agricultural production and agriculture sector employs 80% of all economically active women in India; they comprise 33% of the agriculture labour force and 48% of the self-employed farmers [5]. Though females play an important role in agricultural production, but are constrained by digital, rural and gender, and that leads them to less access to ICTs, leaving them and their families at a disadvantage state [6]. Social norms, lack of connectivity and poverty are some of the reasons that make rural women less access to ICTs. Gender inequalities remain a serious issue in the

digital economy, as does the gap between urban and rural populations. Identifying the right mix of technologies and strategies that are gender-sensitive and suited to local needs are critical in increasing farm efficiency and revenues. Access of rural women to ICTs, usage of ICTs by rural women and understanding various agro-technologies by rural women through ITCs will benefit the women in increasing agricultural production and to challenge the existing gender imbalance in rural livelihoods. The present study was carried out with the aim of studying the impact of intervention programmes on knowledge and use of selected ICT tool by FWKG members. Further it explored the relationship of socio-personal characteristics of the members with their knowledge and use of selected ICT tool.

## 2. METHODOLOGY

**Selection of sample:** The study was conducted in Jorhat district of Assam. Koliapani block was selected through simple random sampling method. From the block, five villages were selected purposively in consultation with the Director of Research, Assam Agricultural University (AAU), Jorhat and Scientists from Krishi Vigyan Kendra, Jorhat. Selected villages were within the radius of 30 kms from the AAU head quarter having good connectivity. Rural women having farming as an occupation were selected purposively. Six Farm Women Knowledge Groups (FWKG) were formed in the selected villages, each group comprising ten members per group. Thus the sample size for the study was 60 members.

Data on socio-personal profile, knowledge and use of ICT tool by FWKG members in agriculture and allied sectors before and after the

intervention programme were collected using a structured interview schedule. Among the ICT tools, mobile phone was selected for the study as it is the most used ICT tool where one can access all types of information provided having an internet connection, handy and comparatively cheaper.

#### Measurement of variables:

**Knowledge & use of different ICT tools & services:** Knowledge on ICT tool was assessed in terms of its functions, different apps and available services. Level of knowledge was asked in three point scale *i.e.* 'no knowledge', 'partial knowledge' and 'complete knowledge' with the score 0, 1 and 2 respectively. Interview was conducted at two different point of time *i.e.* pre-intervention period and post intervention period. Respondents were categorized as 'no knowledge', 'medium knowledge' and 'high knowledge' using percentile, based on the obtained scores of the respondents. Similarly in case of use, respondents were categorized as 'no use', 'medium use' and 'high use' category using percentile.

**Intervention programme:** Intervention programmes were conducted for enhancing the knowledge and use of selected ICT tool for agriculture and allied activities among the FWKG members. Interventions were home based, farm based and community based activities. Intervention programmes such as 'Training on Mobile functioning including receiving and sharing of messages', 'Training on selection and installing of different apps (Agriculture and allied activities) including functioning of internet, utility services on internet and use of social media', 'Awareness on Digital Literacy and Climate Change by using ICT Tools', 'Workshop on digital literacy' and 'Follow-up actions' were conducted. Impact of interventions was assessed with post- test.

**Statistical procedure:** After collection of data, the gathered data were coded, tabulated and statistically analysed. Frequency, percentage, percentile, mean, Standard deviation were calculated to analyse the data. Karl Pearson's product moment method for Correlation Co-efficient was computed to find out the correlation of knowledge and use of selected ICT and socio-personal characteristics of the members. Paired t test was applied to measure the pre and post intervention knowledge and use of ICT. SPSS was used for the statistical tests.

### 3. RESULTS AND DISCUSSION

It was revealed from the Table 1 that 43.30 per cent of the respondents belonged to middle age group between 36 to 50 years and one third (35.00%) were HSLC passed. All the respondents were married and majority had small size family with nuclear type. Regarding occupation, 32.00 percent respondents had farming as the occupation of herself and her family and land holding ranged from marginal to medium. Forty five per cent respondents were marginal farmer and 31.60 per cent and 23.30 per cent were reported as small and medium farmer respectively. All the respondents were member of at least one group or organisation besides FWKGs. More than half of the respondents *i.e.* 66.60 percent were general member of one or more organisations whereas 33.30 percent respondents were office bearers. The data reflected that farm women were already aware of the benefits of organisational membership.

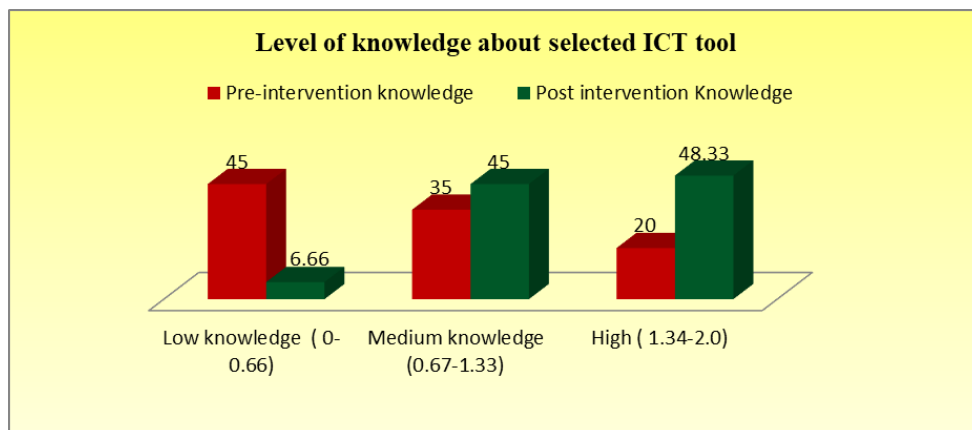
**Level of Knowledge and use of FWKG members on selected ICT tool:** It is observed from the Fig. 1 and Fig .2 that, there is increase in knowledge and use about selected ICT tools in post intervention test compared to pre intervention knowledge and use. High level of knowledge increased from 20.00 per cent to 48.33 per cent whereas low level of knowledge decreased from 45.00 per cent to 6.66 per cent. Similarly in case of high level of use increased from 6.66 per cent to 48.33 per cent. This may be due to the fact that after getting exposed to different ICT tools, farm women started utilizing it in the best possible way and with enthusiasm. Further, they got exposure to Youtube and have started using Youtube for preparation of different products on their own. These data were highly supported by the study conducted by Mittal and Mehar, [7], and Meghwal and Jadav, [8] that farmers were using mobile phones mainly for social communication but later they have increasingly started using it to get connected with people like traders and other farmers who have agricultural activities related information. While Raghuprasad et.al., [9] reported that more than three-fourths (80 per cent) of respondents knew that mobile provides agricultural information. Majority (76.67 per cent) of the respondents knew that ICT tools provide information regarding crop production, protection, post-harvest technologies and other allied activities while 23.33 per cent of the respondents did not know. More than threefourths (76.67 per cent) of

the respondents knew that ICT tools provide marketing and storage information of agriculture and 23.33 per cent of the respondents did not know about it.

**Table 1. Socio personal characteristics of the respondents by gender**

(N=60)

Attributes	Frequency (f)	Percentage (%)
<b>Age</b>		
18-35 years	22.00	36.60
36-50 Years	26.00	43.30
Above 50 Years	12.00	20.00
<b>Education Qualification</b>		
Primary	8.00	13.30
Middle	4.00	6.60
HSLC Passed	21.00	35.00
HS passed	12.00	20.00
Graduate	5.00	8.30
<b>Marital Status</b>		
Married	60.00	100.00
<b>Family Size</b>		
Small	31.00	51.60
Medium	19.00	31.60
Large	10.00	16.60
<b>Family Type</b>		
Nuclear	44.00	73.30
Joint	16.00	26.60
<b>Family occupation</b>		
Farming	32.00	53.30
Service	12.00	20.00
Farm Allied	5.00	8.30
Business	11.00	18.30
<b>Occupation of Respondents</b>		
Farming	32.00	53.30
Service	12.00	20.00
Farm Allied	16.00	26.60
<b>Land Holding</b>		
Marginal	27.00	45.00
Small	19.00	31.60
Medium	14.00	23.30
<b>Membership Status</b>		
General Membership	40.00	66.60
Office Bearer	20.00	33.30



**Fig. 1. Level of knowledge of selected ICT tool in pre and post intervention period**

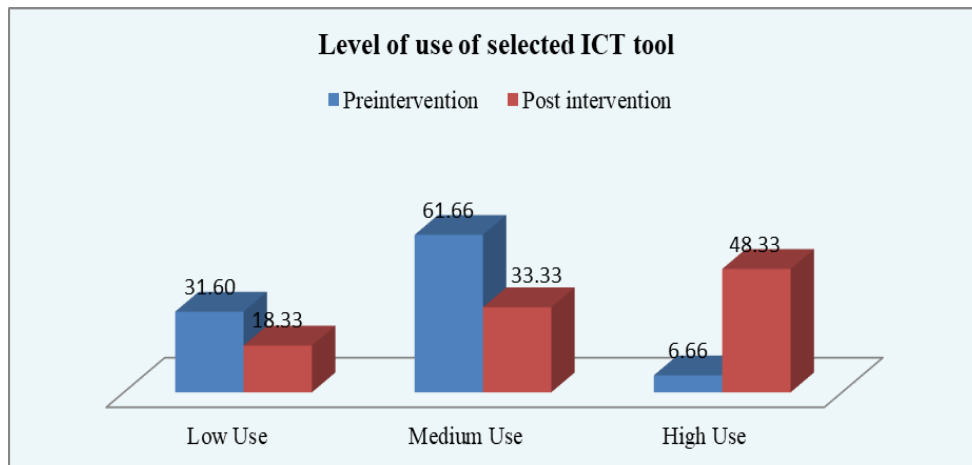


Fig. 2. Level of use of selected ICT tool in pre and post intervention period

**Level of knowledge about different aspects of selected ICT tool in pre and post intervention period:** It is revealed from the Fig. 3 that complete level of knowledge was enhanced up to 41.66 percent after intervention in case of mobile functioning while in pre-test it was 20 per cent only. In case of functioning of Internet it was found that there was increase in complete knowledge from 15.00 per cent to 48.33 per cent after the intervention. Knowledge on utility services on internet got enhanced from 13.33 per cent to 50 per cent. Even in social media complete knowledge was increased from 18.33 percent to 48.33 percent. It was surprising to note that complete knowledge on application of agriculture and allied activities got increased from 8.30 per cent during pre-intervention to 40.00 percent in post-intervention period.

Similar findings were reported by Anderson and Feder, [10]; Ali and Kumar, [11]; Mittal *et al.*, [12]; Mittal and Meher, [13].

**Level of knowledge about use of different aspects of selected ICT tool in pre and post intervention period:** In case of functioning of internet it was found that partial knowledge about use of internet was higher in both pre and post intervention period in all the aspects of mobile use. Data reveals that post intervention knowledge on use of most of the aspects of mobile phone was more than pre intervention, however highest increase was observed in 'applications for agriculture and allied activities' where complete knowledge was increased from nil to 40.00 per cent. This was followed by use of 'social media' where complete knowledge on use

of social media increased by around 40.00 per cent i.e. from 6.66 per cent to 45.00 per cent (Fig. 4).

**Relationship of Knowledge and Use of selected ICT tool:** The 'r' value of pre intervention knowledge and use was found to be positively correlated with 'r' 0.589 and for post intervention it was found to be positively correlated with 'r' value 0.901. It signifies that in both the pre and post intervention phase knowledge and use of ICT tools was positively correlated. (Table 2). From the table it is observed that 't' value for knowledge of ICT was -9.596 which was higher than the critical value of 't' with 59 degrees of freedom reflecting significant difference of mean score of the knowledge on ICT. This implies that there was knowledge gain after the intervention. Likewise in case of Use of ICT, 't' value was found to be -12.435 which was greater than critical value of 't' reflecting significant difference in use of ICT between the pre intervention and post intervention mean score.

**Relationship of socio-personal characteristics of the members with their knowledge and use of selected ICT tool:** In both pre and post intervention of knowledge and use of ICT tools, age was negatively related. It implies that with increased age, both knowledge and use decrease. Contrary to this in case of both knowledge and use, education was found to be positively related which signifies, with higher level of education, knowledge and use of ICT tools increase. In both knowledge and use 'r' value was higher in post intervention period.

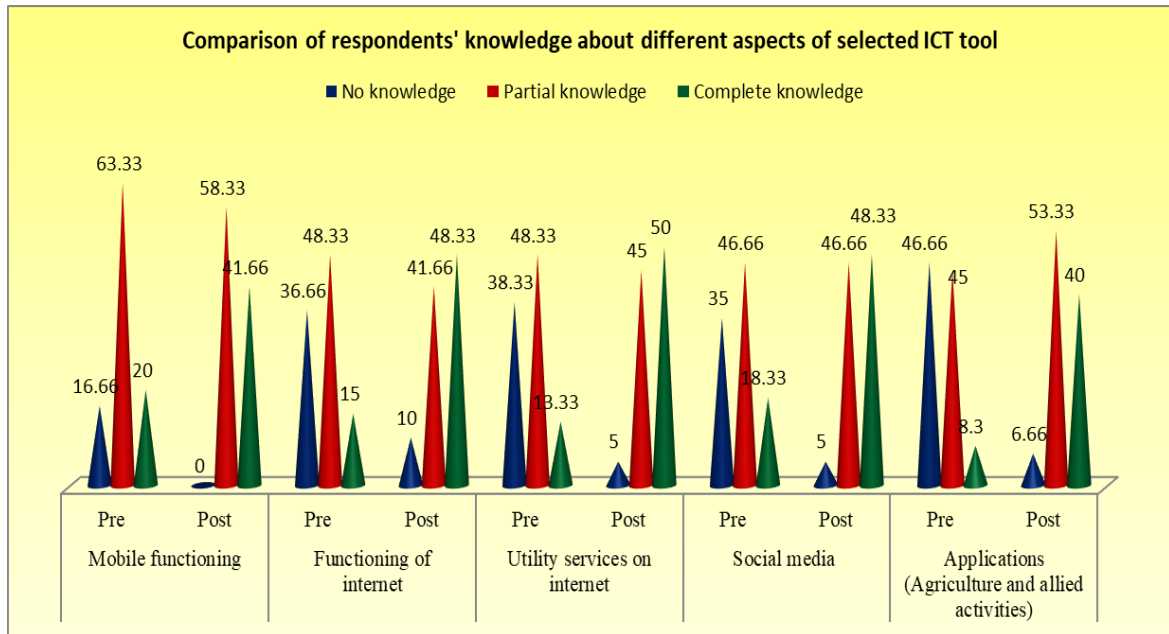


Fig. 3. Distribution of respondents according to Level of knowledge about different aspects of selected ICT tool in pre and post intervention period

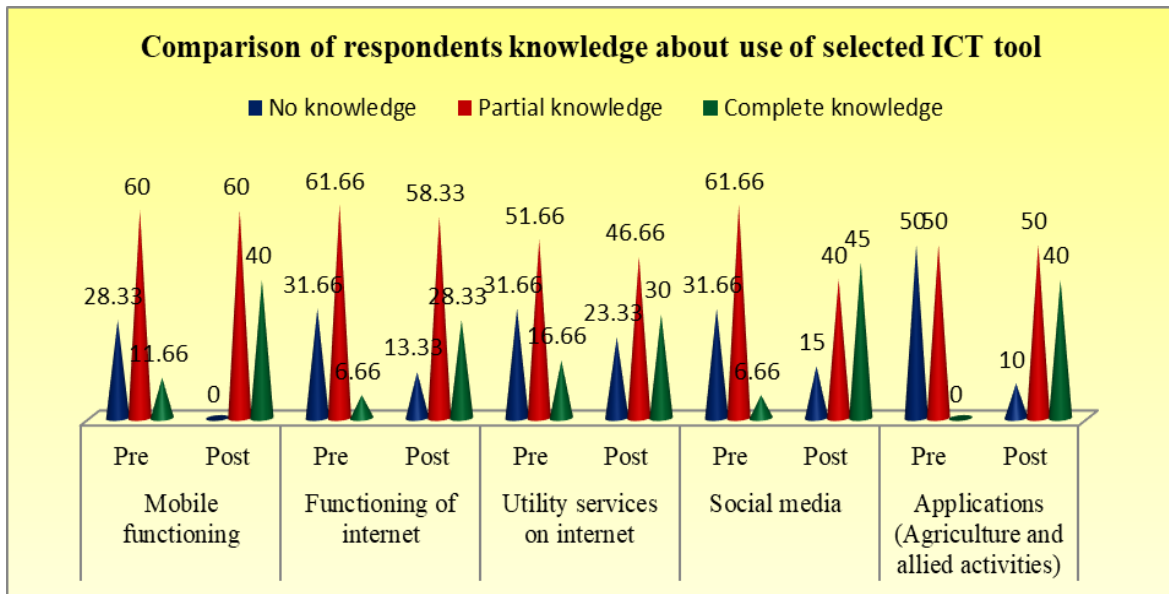


Fig. 4. Level of knowledge about use of different aspects of selected ICT tool in pre and post intervention period

Table 2. Relationship of Knowledge and Use of selected ICT tool

Intervention	Pre-intervention mean score (0-2)	Post intervention mean score (0-2)	Mean difference/Gain	't' Value
Knowledge of ICT	0.8033	1.4033	0.60	-9.596
Use of ICT	0.736	1.243	0.50	-12.435
r value	0.589	0.901	0.31	-

**Table 3. Relationship of personal and social characteristics of the members with their knowledge and use of selected ICT tool**

Profile variable	Knowledge'r 'value		Use'r 'value	
	Pre Intervention	Post intervention	Pre Intervention	Post intervention
Age	-0.281	-0.632	-0.6744	-0.764
Education	0.477	0.582	0.755	0.644
Family size	-0.310	-0.510	-0.423	-0.474
Landholding size	0.0076	-0.216	-0.197	0.413

(N=60)

#### 4. CONCLUSION

The findings of the study revealed that knowledge and use of mobile were better in post-intervention phase than the pre intervention phase. Comparison of knowledge and use of different aspects of ICT tool reflects that 'application of agriculture and allied activities' was found to be highly increased in post-intervention phase while compared with pre-intervention phase. Positive correlation was found between knowledge and use of ICT tool in both pre intervention and post intervention phase. Age was found to be negatively correlated with both knowledge and use of mobile whereas education was found to be positively correlated. It may be concluded that there had been significant impact of ICT intervention in knowledge and use of different aspects of mobile which may scaled up with other ICT tools and may be replicated in other areas.

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#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

#### REFERENCES

- Mittal S, Tripathi G. Role of mobile phone technology in improving small farm productivity. *Agric. Econ. Res. Rev.* 2009;22:451-459.
- Mittal S, Gandhi S, Tripathi G. Socio-economic Impact of Mobile Phone on Indian Agriculture. ICRIER Working Paper no. 246. International Council for Research

- on International Economic Relations, New Delhi; 2010.
- Anonymous. World Development Report 2016: Digital Dividends, World Bank; 2016.
- Bagal Sing Y, Sharma LK, Manhas J. Factors affecting utilization of communication sources by the farmers of Jammu and Kashmir. *Indian Res. J. Ext. Edu.* 2020;52(2):59-64.
- Anonymous. India inequality report 2018, Widening gap. Oxfam India publication. 1918a;1-82.
- Anonymous. 7 success factors to empowering rural women through ICTs. FAO of United Nations; 2018b. <http://www.fao.org/fao-stories/article/en/c/1105823>
- Mittal S, Mehar M. Socio-Economic factors affecting adoption of modern Information and Communication Technology by farmers in India: analysis using Multivariate Probit model. *J. Agric. Educ. Extension*; 2015. DOI:10.1080/1389224X.2014.997255
- Meghwal Kumar P, Jadav NB. Adoption of information and suggestions from farmers to overcome the constraints in the efficient use of mobile communication technologies to transfer Agril. information. *Indian Res. J. Ext. Edu.* 2021;21(2&3):83-85.
- Raghuprasad P, Devaraja SC, Gopala YM. An analysis of knowledge level of farmers on utilisation of ICT tools for farm communication. *Journal of Rural Development.* 2013;132(3):301 – 310.
- Anderson JR, Feder G. *Agricultural Extension Handbook of Agricultural Economics.* 2007;3:2343-2378.
- Ali J, Kumar S. Information and communication technology (ICTs) and farmer's decision-making across the agricultural supply chain. *Int. J. Inf. Manage.* 2010;31(2):149-159.
- Mittal S, Mehar M. How mobile phones contribute to the growth of small farmers? Evidence from India. *Q. J. Int. Agric.* 2012;51(3):227-244.

13. Mittal S. Modern ICT for Agricultural Development and Risk Management in Smallholder Agriculture in India. Socio-Economics Working Paper 3. Mexico, DF: International Maize and Wheat Improvement Center (CIMMYT); 2012.

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