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Constraints faced by farmers in access and use of information and communication technologies (ICTs) in Bihar

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Abstract
In this information age, ICTs play a pivotal medium for knowledge dissemination between research systems and farming system. ICT provides farmers various latest technologies and improves their farm income. Although, Bihar has not such succeeded as other South-western Indian states. The present study was undertaken to find out the constraints faced by farmers in accessing and utilizing of various ICT tools. This study was conducted in the Samastipur and Katihar districts of Bihar during the year 2018-2019. A total of 100 respondents were surveyed for the study. Results showed that, majority of the farmer were facing the problem of insufficient power supply with mean of 2.84 was ranked first followed by connection of internet was poor or slow (2.83), lack of knowledge(2.82), lack of confidence in using ICT tools (2.79), and lack of training programme(2.71). Suggestions given by the respondents were training programme for farmers related to ICT mean of 2.79 (rank I) followed by improve power supply was ranked second with mean value (2.76), improve internet connection (2.74) ranked third.

Keywords: ICT, Constraints of Farmers, ICT tools, ICT Use, accessing.

Introduction
The use of ICT is an essential pillar of agricultural extension and in this present scenario of a rapidly changing world, it has been also recognised as an essential mechanism for delivering knowledge (advice) and information as an input for modern farming. The Information and Communication Technologies (ICTs) can create new opportunities to bridge the gap between information haves and information have-nots in the developing countries. The application of information and communication technology in the recent past, could be witnessed in almost all the sectors in which agriculture too take prominent place. About 130 million of farmers have limited access to information about modern agriculture techniques due to lack of access of extension worker support (one extension worker looks after 1000 farmers).Thus, use of ICTs is becoming very important and widely widespread now a days in agriculture. ICT is the backbone of Digital India. There are many ICT based extension initiatives which have been implemented for strengthening the extension machinery at national and international level. The application of Information and Communication Technology (ICT) can play a essential role in efficient dissemination of information. ICT can deliver fast, reliable and accurate information in a user-friendly manner for the end user. The information disseminated facilitates the farmers to decide when and what to plan, when and how to cultivate, how to harvest, what post-harvest management practices should be followed, when and where the produce should sell in market etc. (USAID, 2010). It was only possible because of exemplary telecom or internet facilities.There were various options that have been explored for transferring essential information to farmers in a timely and cost effective manner. The useful Information and Communication Technologies (ICTs) in enabling access to and exchange of information for farmers is evident. Among ICTs, there has been increasing use of mobile phones and internet which is changing the agricultural communication process. The introduction of mobile phones has resulted in new services and applications. In the agriculture sector, these include access to market information, weather information, monitoring plant health, education, other services etc. According to Telecom Regulatory Authority of India (TRAI) 2018 data the number of telephone subscribers in India, increased from 1,192.04 million at the end of Oct-18 to 1,193.72 million at the end of Nov-18, there by showing a monthly growth rate of 0.14%. The urban subscription 664.54 million at the end of Nov-18, however the rural subscription increased from 524.91 million to 529.18 million during the same period.

However, as per rural tele-density is just 59.27 as compared to 159.81 urban density. So that, India is currently the world's second-largest telecommunications market with a subscriber base of 1.19 billion. India's growing mobile economy now constitutes about 98% of all telephone subscriptions as the mobile industry has witnessed exponential growth over the last few years driven by reasonable tariffs, wider availability, roll out of Mobile Number Portability (MNP), expanding 3G and 4G coverage over many areas, evolving consumption patterns and supportive policy and regulatory environment.

According to report of Census of India, 2011 in Bihar, there were population of 103.80 and total literacy rate of Bihar being 61.8%. The main occupation of people of Bihar is agriculture and more than half of the population depend on this for their livelihood. There were various initiatives for the benefit of the farming community in Bihar for agricultural production and productivity i.e Video conferencing for training the farmers from remote locations, digital storytelling through online streaming services, promoting farm advisory services through Kisan Call Center and Whatsapp application, success stories of farmers, dedicated community radio for the farmers, and offering online courses for promotion of entrepreneurship among the farmers. Today the modern era is a world of ICT, So many information available inspite that farmers of Bihar not properly accessing and using this ICT tools as compared to other states with their productivity as showed CIMMYT 2011 survey. It was reported that about 34.63% of farmers who experienced an increase in yields due to the availability of this information. Of these the highest yield gains were observed by farmers in Punjab (49.2%) and Haryana (42.9%) (Table 1). While in Bihar it was only 21.1% of farmers using mobile phones reporting yield gains. It was also reported that use of tradition ICTs assets (Radio) was high in Bihar as compared to other states. However, survey also showed access to computers or internet (modern assets) was low in Bihar (CIMMYT, 2011). Contraints is the situation or circumstances which restrict or hinder or limit the accessing and using of various ICT tools. Keeping all things in mind, the present study was conducted in Bihar because agriculture is primary source of income available still farmers suffering severe constraints and cannot access and using information properly. So, to know what was the problem farmer facing in using or accessing ICT to get information related to production of crop present study base on it.

Table 1: Comparison of states in respect to mobile phone usage, market connectedness, better price and yield realization.

	Percentage of Farmers			
States	**Using mobile phone for agricultural information**	**Get better connected to markets**	**Getting better prices**	**Increasing yield**
Bihar	51	99	66	21
Haryana	65	99	80	43
Punjab	26	78	83	49
Uttar Pradesh	45	70	70	29
West Bengal	17	66	49	34
Total(n=1200)	41	87	72	35

Note: This percentage of farmers is from the 41% of farmers, who are using mobile phone to access agricultural information, Farmers have multiple responses.

These numbers are being rigorously evaluated under the ongoing research to measure the actual effect of mobile phones in income and welfare of households. Source: CIMMYT Survey (2011).

Research Methodology

The present study has been carried out in Bihar state. Agriculture is the major source of wealth in Bihar. In Bihar, out of 38 districts, the study was conducted in Samastipur and Katihar. Two blocks were selected and from each block two villages were selected so total number of Respondents (farmer) were 100 for study purpose. From the selected blocks namely Pusa and Katihar block, two villages from each block were selected for the present investigation. Thus, total no of selected villages were 4.From Pusa block, Harpur and Morsand and from Katihar, Sirsa and Chilmara were selected. In total 100 respondents viz So, 25 farmers were selected randomly from each village, constituting a sample of 100 farmers for the study as depicted in fig 1.Some of the farmers getting multi message services, attended video conference programmes from KVKs and visit nearby agriculture universities and using various other ICT tools to get information for agriculture practice. An interview schedule was prepared and face to face interview was carried out with respondents (farmer). Constraints main problems faced by the respondent during available, access and usages pattern of information and communication technology for agricultural practice at time of investigation. A constraint index was developed to measure constraints of respondent which they felt by accessing and extent of using ICTs. The responses were obtained on scoring 3,2 and 1 for 'very important ' 'important' and 'less important respectively. Appropriate statistical tests were used for data analysis. There were various technique used in analysis here. Responses were tabulated separately by using frequency and percentage and based on this the problems were ranked the basis of mean as shown in Table 2.

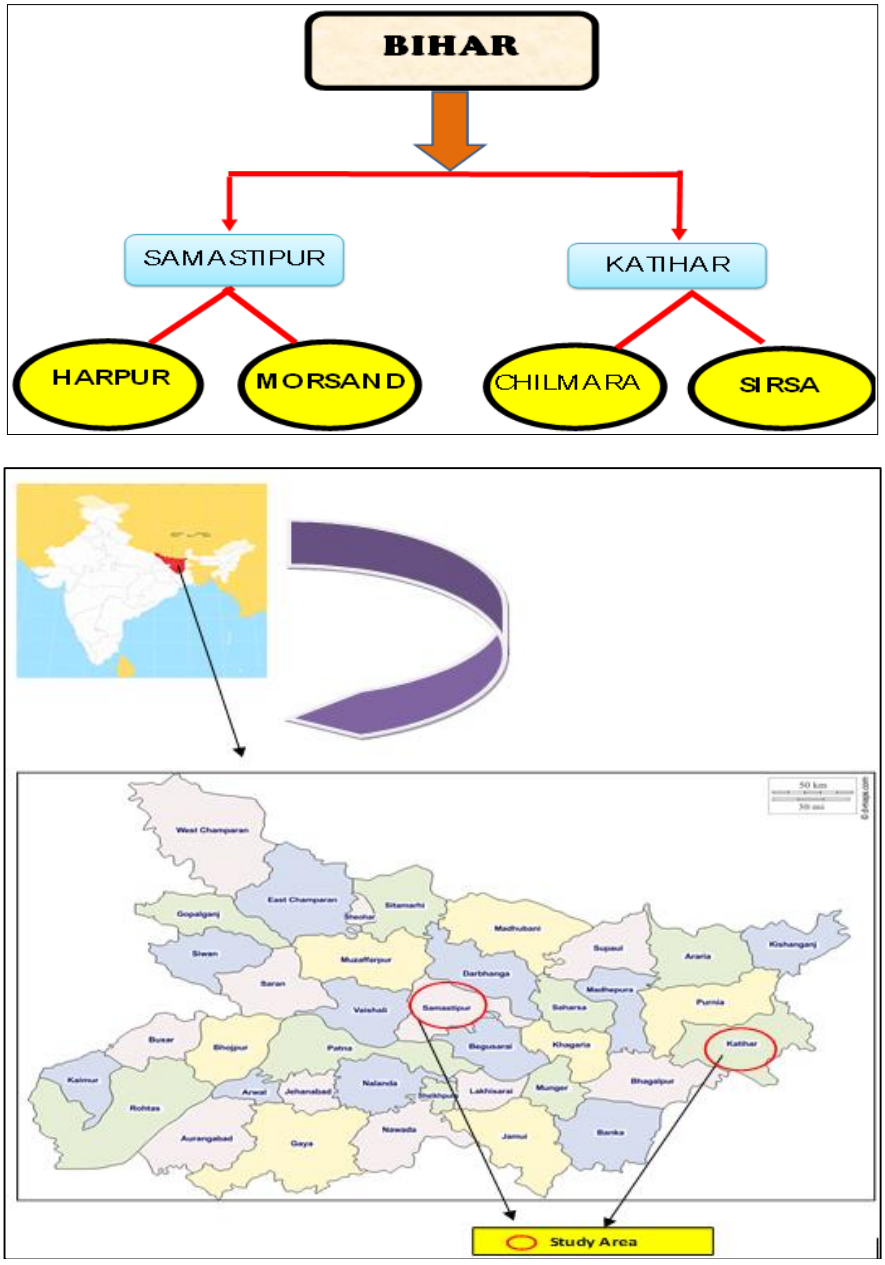

Fig 1: Location of the study

Results and Discussion

Constraints faced by farmers in access and use pattern of information and communication technologies.

Use and accessing of ICT tool in agriculture and rural development is in the detonation stage and farmers were facing experienced many problems. Constraints is the situation or circumstances which restrict or hinder or limit the accessing and using of various ICT tools. From table 2, it revealed that constraint faced by respondent during access and usage pattern of ICTs in which Insufficient power supply with mean of 2.84 was ranked as (I) followed by connection of internet is poor or slow (2.83), lack of knowledge(2.82), lack of confidence in using ICT tools (2.79), lack of training programme (2.71), lack of skill in handling ICT tools (2.67), highly costly (2.66), low literacy (2.62), negative attitude towards ICT tools (2.61), no finance from government (2.60), Lack of awareness benefit of ICT (2.57), lack of information due to language problem (2.56), lack of inadequate tools (2.00), physiological problem i.e mainly eye pain, hearing problem (1.57) with ranks II, III, IV, V, VI, VII, VIII, IX, X, XI, XII and XIII, XIV respectively.

The possible reasons could be that, there was due to erratic power supply leads to low access of ICT tools as these tools mainly depends on electricity i.e. mobile phone, television etc so, it was ranked (I). Majority of famer reported that power supply was irregular in morning time at that time farmers were busy at their agricultural and household chores. Some of them reported that irregular power supply during rainy season and stormy days, there will be no power in the villages and due to lightning and fall of trees on KEB lines thus hinder the use of these tools. The study is also in line with the findings of Rebekka Syiem and Saravanan Raj (2015). Dhaka and Chayal (2010) [4]. IFPRI. (2013) [5].

Some farmers reported that internet connection is slow or poor because of remote area which lead to less signal strength or network saturating bandwidth cause poor connectivity, hence ranked II. They were not able to access internet on regular basis as connectivity was available in only particular place i.e rooftop, courtyard, beyond house in field area etc. The study is also in line with the findings of Agwu *et al*., (2008) [1]; Chilimo (2008) [3], Dhaka and Chayal (2010) [4], Navinkumar (2018) [14].

Lack of knowledge ranked III as there were various web portals and different apps, farmer were unware could not know how to access, thus lack of knowledge also lead to lack of confidence in using ICT tools hence ranked as IV. These constraints mainly seen in old age farmer as compared to young. The study is also in line with the findings of Dhaka and Chayal (2010) [4].

Lack of training programme ranked as V, as without any training programme they were unaware of how to properly use ICTs in order to derive its benefits. Thus lead to unacquainted of the socio-economic benefits and change that ICTs could bring to their lives except for personal communication. The study is also in line with the findings of Rebekka Syiem and Saravanan Raj (2015) [16].

Lack of skill in handling ICT tools ranked as VI, some of respondent do not know how to get information from mobile especially old age farmers, they cannot use most of the basic functions of the mobile phones and internet, such as SMS, using agricultural app, You tube etc. mainly because of illiteracy and lack of skill in using it. The study is also in line with the findings of Rebekka Syiem and Saravanan Raj (2015) [16].

Farmers also reported that the cost of repairing of ICTs for mobile phones and television sets is quite high thus ranked as VII. Due to high illiteracy level Some of the farmers faced problem as they could not understand basic English and sometimes few people hindi also. This is due to the reason that most of mobile phones use English language menus, thus it ranked as VIII. The study is also in line with the findings of Rupender kumar (2016).

Negative attitude towards ICT tools ranked as IX as some of respondents were traditional followers, thus unwilling to use new technology they believed as they conventional technique are best for their crop growing. More over, farmers are not practically exposed to the technologies so they will not ready to take. The study is also in line with the findings of Agwu *et al*., (2008) [1].

Few respondents reported that they were poor and were not afford to purchase television set and android mobile phone with various expenses of internet data pack etc. they were not get any financial assistance from government thus ranked as X. The study is also in line with the findings of Sunil Kumar *et al*. (2017).

Some respondent reported that the majority of the farmers were not know how to properly use ICTs in order to derive its benefits, also unaware of the socio-economic profit of ICTs could bring to their lives except for personal communication. Due to the lack of any ICT related demonstration, training or any kind of experience in using ICT tools and practical exposure among farmers that ICTs could benefit them, it is difficult to promote the impact of ICTs for development thus lack of awareness benefit ranked as XI. The study is also in line with the findings of Rebekka Syiem and Saravanan Raj (2015) [16].

Some respondent reported that they could not understand information because of illiteracy, Lack of language problem ranked as XII as most of information received in English language. The study is also in line with the findings of Dhaka and Chayal (2010) [4]. Lack of inadequate tools ranked as XIII as some respondent were not adequate to purchase the ICTs tools and few of them also reported that there were lack of repairing centres and repairing facilities of ICTs tools i.e mobile phones and television in the villages. The study is also in line with the findings of Rebekka Syiem and Saravanan Raj (2015) [16].

Few respondents were reported that they cannot use ICT tools as they posses certain physiological problem like eye pain, hearing problem etc thus, inadequate to use these were mainly found in old aged farmer thus ranked as XIV. The study is also in line with the findings of Shanthya, M.S and S. Elakkiya (2017).

Table 2: Constraints (in rank-wise) faced by farmers in in access and use pattern information and communication technologies.

Sl. No	Constraints	Degree of importance(n=100)			Mean	Rank order
		More important (%)	Important (%)	Less important (%)		
1.	Insufficient power supply	87	10	3	2.84	I
2.	Lack of confidence in using ICT tools	83	13	4	2.79	IV
3.	Internet connection is poor or slow	86	11	3	2.83	II
4.	Lack of knowledge	85	12	3	2.82	III
5.	Lack of training programme	75	22	3	2.71	V
6.	Lack of skill in handling ICT tools	70	27	3	2.67	VI
7.	Lack of awareness benefit of ICT	64	29	7	2.57	XI
8.	Lack of inadequate tools	74	18	8	2.00	XIII
9.	Lack of information due to languageproblem	62	32	6	2.56	XII
10.	No finance from government	66	28	6	2.60	X
11.	Physiological problem (eye pain etc)	66	25	9	1.57	XIV
12.	Low literacy	68	25	7	2.62	VIII
13.	Highly costly	72	22	6	2.66	VII
14.	Negative attitude towards ICT tools	69	23	8	2.61	IX

Suggestions by Farmers for better accessibility and use Pattern of Information and Communication Technologies (ICTs).

The data presented in the Table 3 revealed that, the majority of farmers expressed the suggestion in using ICTs tool that training program related to ICT with mean of 2.79 ranked as first followed by improve power supply was ranked as second with mean value (2.76), improve internet connection (2.74) ranked as third. Encourage to use ICT tools at village level (2.72)., Farmer awareness about advantages of ICT tools (2.71), Sufficient no of ICT tools at village level (2.70), Source of information should be in regional language (2.66), Provide all agriculture department news in village level (2.67), Forecast about all agriculture news (2.63), Marketing information through ICT tools (2.62), know about kiosk and develop village knowledge centre in village level (2.60) with ranks, IV, V, VI, VII, VIII, IX, X, XI, XII and XIII, respectively.

The possible reasons could be that, majority of the farmers reported that there was a lack of demonstration and practical exposure to use mobile phone applications as well as internet facilities and felt that they needed, some training to teach them how to use ICTs that could take benefit from it thus ranked as I. Majority of people suggested to have improve power supply as because use of ICTs tools was difficult, due to erratic and fluctuating power supply thus, rank as II.

Poor connectivity ranked III because of inadequate networks, farmers can't use mobile phone or internet hence, create barrier in their usage. Encourage to use ICT tools at village level ranked as IV reported by farmers as another problem, no one (extension personnel) was there to train and encourage to use ICTs tool for their daily needs of information regarding weather for casting, climate new schemes agriculture news etc.

Lack of awareness in using ICT tools ranked as V, because they were less exposure and aware of operating ICTs (internet facilities i.e mobile phone applications etc) in order to derive its benefits properly.

Table 3: Suggestion (in rank-wise) given by farmers in in access and use pattern of information and communication technologies.

Sl No	Suggestions	Degree of importance (n=100)			Mean	Rank order
		Very important	Important	Less important		
		(%)				
1	Farmer awareness about advantages of ICT tools	74	17	9	2.71	V
2.	Training program for farmers related to ICT	79	15	6	2.79	I
3.	Improvement internet connection	76	20	4	2.74	III
4.	Forecast about all agriculture news	68	27	5	2.63	XI
5.	Source of information should be in regional language	73	20	7	2.66	VIII
6.	Provide all agriculture department news in village level	72	23	5	2.67	IX
7.	Improve power supply	78	21	1	2.76	II
8.	Sufficient fund for ICT at village level	70	18	12	2.68	VII
9.	Encourage to use ICT tools at village level	71	23	6	2.72	IV
10.	Marketing information through ICT tools	70	26	4	2.62	XII
11.	Provide technical staff at village level	72	18	10	2.65	X
12.	Sufficient no of ICT tools at village level	74	19	7	2.70	VI
13.	Know about kiosk and develop village knowledge centre in village level	62	20	18	2.60	XIII

Conclusion

Development of agriculture in the present scenario depends on bridging the awareness gap among the end users. In this regard ICT enables better improvement in agriculture. The aim of this research was to provide information of finding on the difficulties that farmers faced in using ICT tools for crop practice and growing in Bihar. The findings of this study indicate that farmers have a strong desire for the incorporation of ICT into farming but they encountered many barriers to it like erratic power supply, poor internet connectivity, lack of knowledge in using and handling various ICT tools. So, effective access as well as utilization of ICT has potential to make the rural communities prosperous as it enables the dissemination of requisite information in user friendly form, easy to access, cost-effective ways at the right time.

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