

**RESEARCH ARTICLE :**

# Constraints faced by farmers in utilization of information and communication technologies (ICTs)

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**SUMMARY :** Information and communication technologies can have a significant impact in area of agricultural extension, which depends to a large extent on exchange of information between and among farmers and a broad range of other actors *viz.*, researchers, extension workers, input dealers, market functionaries etc. Considering the importance of ICT in transfer of technology among agricultural stakeholders, it was felt necessary to find out the major constraints which hinder the utilization of ICTs by farmers. Therefore, present investigation was undertaken with the objective to study the constraints faced by farmers in utilization of information and communication technologies. The study was conducted in selected districts of Karnataka and Kerala states in India during the year 2016-18. Ninety farmers were selected randomly from Dharwad district in Karnataka and Thrissur district in Kerala (45 each) to study the constraints in utilization of information and communication technologies (ICTs) by farmers. The data were collected from each farmer, through personal interview method with the help of structured schedule. Regarding farmers of Karnataka, lack of infrastructure facilities was ranked first among infrastructure constraints with an index of 38.89 per cent followed by low network coverage (CI=31.11 %). Among affordability constraints, high cost of ICT gadgets was ranked first for farmers of Karnataka (CI= 50.00 %) and Kerala (CI= 55.56 %). Lack of confidence in using ICT (CI=27.78 %) and lack of time to utilize ICT tools (CI=32.22 %) were the major socio-psychological constraints faced by farmers in Karnataka and Kerala, respectively. Lack of training on ICT tools was the major technical constraint faced in using ICTs by farmers of Karnataka (75.56 %) and Kerala (72.22 %). Major utility constraint faced was lack of locally relevant information as expressed by almost sixty five per cent of farmers from Karnataka (CI= 65.56 %) and Kerala (CI= 66.67 %).

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## **BACKGROUND AND OBJECTIVES**

Information and communication technologies can have a significant impact in area of agricultural extension, which depends to a large extent on exchange of information

between and among farmers on the one hand, and a broad range of other actors *viz.*, researchers, extension workers, input dealers, market functionaries etc. on the other. Agricultural extension services are intended to respond meaningfully to farmers, to transfer

appropriate knowledge and endow with advice on various demands ranging from on-farm activities to off-farm, finance, business and market related concerns. The ideas, advice and information so provided influence the decisions of farmers. Mugwisi *et al.* (2015) reported that any information and communication technology (ICT) intervention that improves the livelihoods of poor rural families is likely to have a significant impact (direct and indirect) on enhancing agricultural production, marketing and post-harvest activities.

Since, ICTs have become an integral constituent of extension system and future strategies for agricultural development will be more oriented towards cyber extension or e-extension. However, benefits of ICT are yet to reach farmers. There may be constraints at field level which need to be investigated. Considering the importance of ICT in transfer of technology among agricultural stakeholders, it was felt necessary to find out the major constraints which hinder the utilization of ICTs by farmers. Therefore, present investigation was undertaken with the objective to study the constraints faced by farmers in utilization of information and communication technologies.

## RESOURCES AND METHODS

The study was conducted in selected districts of Karnataka and Kerala states in India during the year 2016-18. Ninety farmers were selected randomly from Dharwad district in Karnataka and Thrissur district in Kerala (45 each) to study the constraints in utilization of information and communication technologies (ICTs) by farmers. The data were collected from each farmer, through personal interview method with the help of structured schedule. Constraints were divided into five categories *viz.*, infrastructure constraints, affordability constraints, socio-psychological constraints, technical constraints and application or utility constraints.

Constraint index (CI) was calculated based on the responses for each of the constraints under the five categories obtained from farmers using the following formula:

$$\text{Constraint index (CI)} = \frac{\text{Actual score}}{\text{Maximum possible score}} \times 100$$

$$\text{Actual score} = F_{vs} \times 2 + F_s \times 1 + F_{ns} \times 0$$

where,

F<sub>vs</sub> = Frequency of farmers facing very serious

constraint

F<sub>s</sub> = Frequency of farmers facing serious constraints

F<sub>ns</sub> = Frequency of farmers facing no constraints.

$$\text{Maximum possible score} = \text{Total number of farmers} \times 2$$

Constraints faced by farmers in utilizing ICTs were ranked based on the constraint index (CI).

## OBSERVATIONS AND ANALYSIS

Data presented in Table 1 revealed the constraints faced by farmers in Karnataka and Kerala in utilization of ICT tools. Regarding farmers of Karnataka, lack of infrastructure facilities was ranked first among infrastructure constraints with an index of 38.89 per cent followed by low network coverage (31.11 %), electricity problems (26.67 %) and lack of internet connectivity (22.22 %) which scored second, third and fourth ranks, respectively. Concerning farmers of Kerala, lack of infrastructure facilities was ranked first among infrastructure constraints with an index of 58.89 per cent followed by low network coverage (41.11 %) and lack of internet connectivity (20.00 %) which scored second and third ranks, respectively. Lack of infrastructure facilities was found as major infrastructure constraint for farmers of Karnataka and Kerala. Utilization depends on availability and accessibility of ICT infrastructure and unavailability of ICT gadgets act as a major barrier for utilization of ICTs by farmers. Low network coverage and lack of internet connectivity was also expressed by farmers of Karnataka and Kerala as barriers in usage of ICTs. This might be due to poor internet connectivity infrastructure in rural area. Similar findings were made by Dhaka and Chayal (2010) who elicited poor internet connection as a major barrier for utilization of information and communication devices by farmers.

Among affordability constraints, high cost of ICT gadgets was ranked first for farmers of Karnataka (CI= 50 %) and Kerala (CI = 55.56 %) and high internet cost ranked second with constraint indices of 18.89 per cent and 27.78 per cent for farmers of Karnataka and Kerala, respectively. ICT tools like personal computer, smartphone etc. may not be affordable for all farmers because of high price. Omar *et al.* (2011) reported high cost of ICT tools was the main reason for negative attitude towards use of ICTs. Ogbonna and Agwu (2013) also elicited the prime constraint in the use of ICTs by

farmers as high cost of ICT infrastructure.

Lack of confidence in using ICT (CI=27.78 %) was the major socio-psychological constraint faced by farmers in Karnataka. Lack of time to utilize ICT tools and technology fear were also act as barrier for using ICT by nearly twenty per cent of farmers. Farmers of Kerala expressed lack of time to utilize ICT tools (CI=32.22 %) as a major constraint. Lack of motivation to use ICT (CI=31.11 %) and lack of confidence in using ICT (CI=30.00 %) also socio-psychological barriers faced in using ICTs by appreciable number of farmers. Naik (2014) revealed lack of motivation to use ICTs and lack of confidence in using the ICTs as barriers to adopt ICT based services. Rebekka and Saravanan (2015) also ascertained the major problem in the use of ICTs by the

farmers was lack of confidence in operating ICTs.

Major technical constraint in using ICTs was lack of training about how to use ICT tools by farmers of Karnataka (CI= 75.56 %) and Kerala (CI=72.22 %). It was found that majority of farmers in Karnataka and Kerala attended training programmes of various farming related aspects, but number of farmers who attended any training related to ICTs was negligible. Naik (2014) also revealed the lack of training as major barrier to adoption of ICT based extension services by farmers. This pointed out the need for organizing training programmes related to use of emerging ICT tools such as mobile apps, social media etc. to avail information for betterment of farming.

Non-availability of inputs suggested through ICTs

**Table 1 : Constraints in utilization of ICTs by farmers of Karnataka and Kerala**

Sr. No.	Constraints	Karnataka (n <sub>1</sub> =45)		Kerala (n <sub>2</sub> =45)	
		Constraint index (%)	Rank	Constraint index (%)	Rank
<b>Infrastructure constraints</b>					
1.	Electricity problems	26.67	III	7.78	IV
2.	Lack of infrastructure facilities	38.89	I	58.89	I
3.	Lack of internet connectivity	22.22	IV	20.00	III
4.	Low network coverage	31.11	II	41.11	II
<b>Affordability constraints</b>					
1.	High cost of ICT gadgets	50.00	I	55.56	I
2.	High internet cost	18.89	II	27.78	II
<b>Socio-psychological constraints</b>					
1.	Technology fear	17.78	III	14.44	VI
2.	Lack of confidence in using ICT	27.78	I	30.00	III
3.	Lack of motivation to use ICT	10.00	VI	31.11	II
4.	Lack of faith in ICT tools and services	14.44	IV	20.00	V
5.	Traditional belief in existing system	12.22	V	28.89	IV
6.	Lack of time to utilize ICT tools	18.89	II	32.22	I
<b>Technical constraints</b>					
1.	Non availability of inputs suggested through ICTs	56.67	II	37.78	II
2.	Lack of knowledge about ICT tools	36.67	V	21.11	IV
3.	Lack of training about how to use ICT tools	75.56	I	72.22	I
4.	Not able to understand technical information	37.78	IV	15.56	V
5.	Lack of support from agriculture department	3.33	VII	25.56	III
6.	Lack of local assistance to clarify doubts	6.67	VI	11.11	VII
7.	Lack of expertise to use the ICTs	40.00	III	13.33	VI
<b>Application/utility constraints</b>					
1.	Lack of locally relevant information	65.56	I	66.67	I
2.	Problem of foreign language	32.22	III	12.22	III
3.	Complex nature of ICT tools	35.56	II	23.33	II

was ranked second among technical constraints faced by farmers of Karnataka (CI=56.67 %) and Kerala (CI=37.78 %). The probable reason is that information available in websites, mobile apps, social media etc. may not be location specific and hence farmers could not adopt the recommendations obtained from ICT tools because of unavailability of inputs say fertilizer or plant protection chemicals etc. in their local market. Lack of expertise to use the ICTs (40.00 %), inability to understand technical information (37.78 %) and lack of knowledge about ICT tools (36.67 %) were also expressed as barriers for ICT use by Karnataka farmers. This might be attributed to old age or lower education level of farmers. Results were in line with findings of Olaniyi (2013) who reported that inadequate technical knowhow was a severe constraint in using ICT facilities by farmers. Mahalakshmi *et al.* (2015) also identified that the key problems hindering the use of ICTs in the farming operations were lack of ICT based technical knowledge and lack of technical support.

Major application or utility constraint faced was lack of locally relevant information as expressed by almost sixty five per cent of farmers from Karnataka (CI= 65.56 %) and Kerala (CI= 66.67 %). Most of the information obtained through ICT tools does not found suitable for their farming situation, which might hinder the use of ICT tools to access information by farmers. Dhaka and Chayal (2010) also observed insufficient regional specific information emerged as most prominent barrier for farmers in making best use of ICT services. Complex nature of ICT tools was also experienced as a barrier for utilization of ICTs by considerable proportion of farmers of Karnataka (CI=35.56 %) and Kerala (23.33 %). A large majority of farmers utilized either mobile phone or smartphone but lower usage of other ICT tools like computer or laptop may be due to their complex nature compared to mobile phone. Nearly thirty per cent Karnataka farmers expressed problem of foreign language as a utility constraint. This might be due to their lower educational level.

The study revealed that foremost constraint in utilization of ICT tools by farmers was lack of training to improve skills in using modern ICT tools and techniques. So Agriculture Department should design and implement training programmes related to ICTs for farmers at Gram Panchayat level. Lack of location specific information also found to hinder the use of various ICTs by farmers

for obtaining agricultural related information. So agriculture and marketing portals, websites and also mobile applications for agriculture should be developed based on location-specific information and in regional language for effective use of these tools by farmers. Gram Panchayat can take initiative to establish one centre of computer and internet for farmers. Such centres can link relevant specific websites and applications which can provide information regarding agricultural production as well as allied enterprises. Department of Agriculture should plan for hands on training in such centres. There is need for integration of Rural Development Department and Agricultural Department to benefit from ICT initiatives like flagship programme Digital India.

### Conclusion:

The study observed the lack of infrastructure facilities as major infrastructure constraint and high cost of ICT tools as main affordability barrier for farmers of Karnataka and Kerala. Lack of confidence in using ICT was the major socio-psychological constraint faced by farmers in Karnataka, whereas farmers of Kerala expressed lack of time to utilize ICT tools as most important constraint. Lack of training about how to use ICT tools was the main technical constraint faced by farmers of Karnataka and Kerala. In addition, farmers faced the problem of unavailability of inputs that are prescribed through ICTs. Major application or utility constraints that hinder the use of ICTs by farmers of Karnataka and Kerala were lack of locally relevant information and complex nature of ICT tools. The Government can establish or improve ICT infrastructure through Gram Panchayats and make available computer and internet facilities at one place for the use of farmers. Department of Agriculture should plan for training programmes related to ICT tools for farmers.

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