Biological Forum – An International Journal **15(2): 651-655(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Opinion on Adoption and Effectiveness of Information and Communication Technologies in Crop Production

Sagar S. Pujar[1*], Amaresh Kumar K.[2], Sahana S.[3], D. Shashikalabai[4] and Sai Tejashree G.[5]

[1]Scientist, ICAR, Krishi Vigyan Kendra- Bengaluru Rural,
UAS, Bangalore (Karnataka), India.
[2]Professor, Department of Agricultural Extension,
College of Horticulture, Hiriyur, KSNUAHS, Shivamogga (Karnataka), India.
[3]Associate Professor, Department of Agricultural Extension,
College of Agriculture, KSNUAHS, Shivamogga (Karnataka), India.
[4]Assistant Professor, Department of Agricultural Engineering,
College of Horticulture, Hiriyur, KSNUAHS, Shivamogga (Karnataka), India.
[5]Senior Research Fellow, ICAR, Krishi Vigyan Kendra- Bengaluru Rural,
UAS, Bangalore (Karnataka), India.

(Corresponding author: Sagar S. Pujar)*
(Received: 03 January 2023; Revised: 09 February 2023; Accepted: 13 February 2023; Published: 18 February 2023)
(Published by Research Trend)

ABSTRACT: The study was conducted in the year 2017-18 in Shivamogga and Chikkamagaluru district of Karnataka state with a sample size of 120 farmers. Simple random sampling procedure was used to select the sample. The data was collected with the help of structured interview schedule. It was found that majority (86.67 %) of farmers were aware first-time information about transplanting tree along the roots, followed by 81.67 per cent of the farmers inferred growing different shapes of fruits, Groundnut shell decorticator by cycle wheel (80.83%), weeding by bikes (74.17%) and Egg grading machine by (70.83%) respectively. Followed by Chopping the fodder by bike (58.33%) and Snake repellent stick (21.66%) was perceived by farmers as first-time information received from the different ICT tools. Further, 80.00 per cent of ICT tool user farmer inferred that they had adopted technology on paddy transplanter. The reason was that, the study was conducted in malanad and hilly regions where most of the farmers were cultivated paddy as major crop. Hence, the farmers had adopted paddy transplanter technology, followed by 70.00 per cent of the farmers inferred they had adopted technology on Rain water harvesting techniques. Majority 66.60 per cent of the What's app users said that the information on production aspect was effective. 51.70 per cent of the KCC tool users opined that these two tools were less effective regarding quality inputs aspects.

Keywords: Adoption, Effectiveness and ICT tools, Communication Technologies.

INTRODUCTION

Information and Communication Technology (ICT) has proved its vibrant role in facilitating development corridors. However, the developmental goals of 21st century will not be meet until and unless the technologies get adopted and utilized effectively by different groups including rural mass. Research endeavors focusing on ICTs may contribute to minimize the current digital gap among the potential users. Agriculture is the main stay of the Indian economy. It has always played and plays an important role in economic and social development of the developing country like India, where around 58% of the Indian population is involved in the farming and allied sectors (Age *et al.*, 2012; Pujar *et al.*, 2021). In developing countries, ICT in agriculture provides the farming community with critical information right from sowing to post-harvesting by allowing farming community to increase agricultural productivity (Pavithra *et al.*, 2018; Vineetha *et al.*, 2019; Vivek and Sahana 2021). Weather advisories and alerts assist them in preparing for sporadic events such as floods, drought, or pest and disease outbreaks, preventing significant crop loss (Fawole and Olajide 2012; Rajneesh and Sisodia 2020; Liu *et al.*, 2021). ICTs also provide them with a dependable channel to seek the best market price in their local markets, as well as other daily updates for their produce, ensuring that they receive fair returns. Farmers living in remote areas in several emerging countries benefit from the increasing penetration of low-cost mobile phones and the internet. Access to low-cost mobile devices. With this backdrop, the present investigation was taken up to assess the farmers opinion on effectiveness of various ICT tools in crop production.

METHODOLOGY

The study was conducted in Shivamogga and Chikkamagaluru districts of Karnataka State. In Shivamogga district the what's app group of KSDA and Kissan call centre were selected. Similarly, e-Krushika app and KVK Kissan mobile agro advisory services in Chikkamagaluru district were selected purposively. Under each district two taluks were selected. Under each taluk two villages were selected with a minimum of 5 km and maximum of 15 km radius from the taluk headquarters, where 15 farmers were randomly selected from each village. Thus, the total sample constituted to 120. The data was collected using pretested interview schedule. The responses were scored, classified, analyzed and tabulated with the help of frequency and percentage techniques

Selection of the population: The farmers using the ICT tools in the Shivamogga and Chikkamagaluru districts were constituted as population of the study.

Selection of respondents: From each village, fifteen farmers were selected by using simple random sampling technique. Thus 120 ICT user farmers were selected for the study.

RESULTS AND DISCUSSION

It was clear from Table 1 that Cent 100.00 per cent of different ICT tool user farmers said that they first-time aware innovative technology information on transplanting machines and low-cost lemon grading machine. The reason might be that the respondents who were using ICT tools for the purpose of knowing latest agricultural technologies. Among latest technology available, transplanting machines and low-cost lemon grading equipment was pursued as first time aware innovative technologies from all the four ICT tools user farmers. Whereas, meager 21.66 per cent of the ICT tool user farmers stated that they first aware innovative technology information was snake repellent stick, the reason may be that this technology might not aware by many of the farmers.

Table 1: First time aware innovative technologies by ICT tool user farmers (n=120).

Topics	Frequency	Percentage
Transplanting machines	120	100.00
Drone in agriculture	114	95.00
Growing different shapes of fruits	98	81.67
Transplanting the tree along the roots	104	86.67
Low-cost lemon grading equipment	120	100.00
Weeding by bikes	89	74.17
Chopping the fodder by bike	70	58.33
Egg grading machines	85	70.83
Spraying PPC from bikes	110	91.67
Groundnut shell decorticating by cycle wheel	97	80.83
Snake repellent stick	26	21.66

Responses are mutually inclusive

Adoption of technologies by ICT tool user farmers. It can be seen from the Table 2 that majority 80.00 per cent of ICT tool user farmer inferred that they had adopted technology on paddy transplanter. The reason was that, the study was conducted in malanad and hilly regions where most of the farmers were cultivated paddy as major crop. Hence, the farmers had adopted paddy transplanter technology, followed by 70.00 per cent of the farmers inferred they had adopted technology on Rain water harvesting techniques the reason was that water is an important resource for crop production and becoming scares day by day, keeping this problem in view the respondents adopted rain water harvesting technology in their fields. Whereas, 16.67 per cent of the respondents stated that they had adopted technology on coffee cleaning and bagging machine, the probable reason may be the high investment on coffee cleaning and bagging machine it requires huge investment by the farmers and it is difficult by the small and marginal farmers. Hence, only few farmers who have been able to invest on this machine might had adopted this technology.

Table 2: Adoption of technologies by ICT tools user farmers (n=120).

Technology	Frequency	Percentage
Coffee powder machine	37	30.84
Rainwater harvesting	84	70.00
Coffee cleaning and bagging machine	20	16.67
Fertilizer calculator	47	39.16
Transplanting machine	26	21.67
Paddy transplanter	97	80.83

Responses are mutually inclusive

Effectiveness of ICT tools in adoption of technologies. The data in Table 3 inferred effectiveness of ICT tools in adoption of technologies. Most 47.50 per cent of the respondents opined that the technologies disseminated from these ICT tools were less effective. The reason could be that the innovative technologies had some degree of risk in adoption, needs investment due to complexity involved in technologies, farmers were expressed these tools are less effective (Pujar *et al.*, 2021).

Table 3: Effectiveness of ICT tools in adoption of technologies (n=120).

Category	Frequency	Percentage
More	13	10.80
Moderate	50	41.70
Less	57	47.50

Table 4: Opinion of the farmers about effectiveness of ICT tools in crop production aspects (n=120).

Sr. No.	Category	ICT Tools	Effective		Moderately effective		Less effective	
			F	P	F	P	F	P
1.	**Production**	Whats app	80	66.70	20	16.70	20	16.60
		e-Krushika App	23	19.20	77	64.10	20	16.70
		SMS services	27	22.50	61	50.80	32	26.70
		KCC	32	26.70	49	40.80	39	32.50
2.	**Quality inputs**	Whats app	12	10.00	37	30.80	71	59.20
		e-Krushika App	54	45.00	32	26.70	34	28.30
		SMS services	46	38.30	32	26.70	42	35.00
		KCC	13	10.80	45	37.50	62	51.70
3.	**Weather forecasting**	Whats app	13	10.80	30	25.00	77	64.20
		e-Krushika App	00	00. 00	00	00. 00	00	00.00
		SMS services	26	21.60	65	54.20	29	24.20
		KCC	56	46.70	30	25.00	34	28.30
4.	**Market news and intelligence**	Whats app	15	12.50	16	13.30	89	74.20
		e-Krushika App	74	61.70	40	33.30	06	05.00
		SMS services	61	50.80	35	29.20	24	20.00
		KCC	34	28.30	53	44.20	33	27.50
5.	**Post-harvest technology**	Whats app	30	25.00	51	42.50	39	32.50
		e-Krushika App	64	53.30	26	21.70	30	25.00
		SMS services	49	32.50	28	23.30	53	44.20
		KCC	20	16.70	37	30.80	63	52.50

F = Frequency; P = Percentage

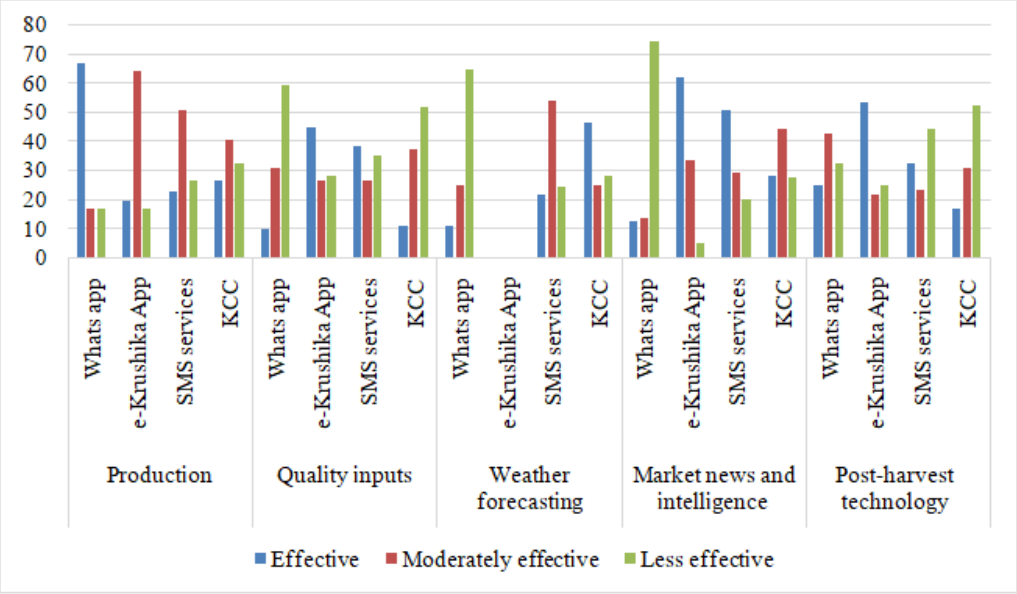

Fig 1. Opinion of the farmers about effectiveness of ICT tools in crop production aspects.

Opinion of the farmers about effectiveness of ICT tools in crop production aspects. The data in Table 4 and Fig. 1 gives the opinion of the farmers about effectiveness of ICT tools in crop production aspects. Majority 66.60 per cent of the Whats app users said that the information on production aspect was effective. The probable reason may be that the production aspects like seed treatment, transplanting, weeding, inter-cultivation and innovative method of spraying were explained detail in local language which made the farmers to grasp the things easy. Hence, farmers opined that information here was effective. Followed by 64.20 per cent of the e-Krushika app users, 50.80 per cent of the KMAS tool user farmers and 40.80 per cent of the KCC user respondents said that these tools were moderately effective on production aspects. The probable reason may be that the farmers received need based, and scientific information in the local language which might solved certain extent of problems of the farmers so they opined these tools were moderately effective in production aspects (Pujar *et al.*, 2021; Spandana *et al*., 2022).

Majority 59.20 per cent of Whats app user farmers and 51.70 per cent of the KCC tool users opined that these two tools were less effective regarding quality inputs aspects. The probable reason may be that the non-availability of accurate information regarding the selling quality seeds, fertilizers, plant protection chemicals and lack of information regarding quantity of the product available and price of the product in farmer locality made farmers to opine Whats app and KCC was less effective. Most of the e-Krushika app (45.00%) and KMAS (38.30%) user farmers opined these tools are effective. The reason might be that e-Krushika app provided information on new technologies. The KMAS provide information regarding the availability of seeds and fertilizers including plant protection chemicals. Therefore, farmers opined that e-Krushika app and KMAS were effective regarding quality inputs aspects (Sideridis *et al.*, 2010; Sowjanya, 2017; Rajashekar *el al*., 2022).

While, majority 64.20 per cent of Whats app users said it was less effective regarding weather forecasting. The reason may be that, weather aspects most of the times unpredictable. Hence, Whats app users opined weather forecasting information was less effective. Further none of the farmers given response with respect to weather forecasting aspect, the reason due to that the e-Krushika app is mainly disseminating information on crop production aspects nowhere share information on weather forecasting.

The majority 74.20 per cent of the Whats app user farmers opined that market news and intelligence information was less effective, the reason for this result was that the Whats app group members might not had experience on getting marketing of agriculture produce and price of various commodities in different markets. It is complex phenomenon by the group members to provide accurate information on agriculture produce.

Further 61.70 per cent and 50.80 per cent of e-Krushika app and KMAS tool user farmers opined that market news and intelligence was very effective, the reason may be that the e-Krushika app is exclusively developed for who are cultivating commercial and plantation crops. The app developers were concentrated this in addition to crop production aspect. Hence, it was effective in e-Krushika app even KMAS was taken much interest on prices of each commodity and market of produce.

With respect to post harvest technology majority 53.30 per cent of the e-Krushika app user farmers opined that post-harvest technology aspect was effective the probable reason for this due to the farmers of this group may gain knowledge about the post-harvest technology which is important aspect in the crop production. Further 42.50 per cent of the Whats app user respondents opined that post-harvest technology information was moderately effective the reason for this may be that the Whats app was developed to share all crop production aspects and latest agricultural innovation so farmers were moderately satisfied on this aspect.

CONCLUSIONS

Technological upgradation and acceptance of those updated and improved production techniques are crucial steps in the development process of every agrarian economy (Gursteinm 2003; Murty and Abhinov 2012). This is especially true for agricultural development in countries like India, where crop output has increasing largely over many years due to a multiplicity of factors including adoption and use of improved production methods. To make improvements in the agricultural sector, extension activities for the transfer of agricultural technologies from lab to land is inevitable (Narula and Arora 2010; Mohammad and Md 2011; Pujar *et al.*, 2021). This results into the technology transfer model of agricultural extension, seen by many as the main purpose of agricultural extension. This is based on the premise that "modern" knowledge or technology is transferred via extension agents to recipient farmers. Thus, agricultural extension is the sensible communication of information to help farmers form sound opinions and make good decisions for sustainable farming.

Conflict of Interest. None.

REFERENCES

Age, A. I., Obinne, C. P. O. and Demenongu, T. S. (2012). Communication for sustainable rural and agricultural development in Benue State, Nigeria. *Sustainable Agriculture Research*, *1*(1), 118.

Fawole, O. P. and Olajide, B. R. (2012). Awareness and use of information communication technologies by farmers in Oyo State, Nigeria. *Journal of agricultural & food information*, *13*(4), 326-337.

Gurstein, M. (2003). Effective use: A community informatics strategy beyond the digital divide. *First Monday*.

Liu, W., Shao, X. F., Wu, C. H. and Qiao, P. (2021). A systematic literature review on applications of information and communication technologies and blockchain technologies for precision agriculture development. *Journal of Cleaner Production*, *298*, 126763.

Nazari, M. R., & Hassan, M. S. B. H. (2011). The role of television in the enhancement of farmers' agricultural knowledge. *African Journal of Agricultural Research*, *6*(4), 931-936.

Murty, D. T. and Abhinov, T. (2012). Electronic media in rural agricultural business-A promotional injection. *Abhinav National Monthly Refereed Journal of Research in Science & Technology*, *1*(11), 63-68.

Narula, S. A. and Arora, S. (2010). Identifying stakeholders' needs and constraints in adoption of ICT services in rural areas: the case of India. *Social Responsibility Journal*.

Pavithra, S., Gracy, C. P., Saxena, R. and Patil, G. G. (2018). Innovations in agricultural marketing: a case study of e-tendering system in Karnataka, India. *Agricultural Economics Research Review*, *31*(347-2018-3189), 53-64.

Pujar, S. S., Kumar, K. A., Kavyashree, C., Suresha, S. V. and Shashikalabai, D. (2021). Profile characteristics association with the utilization pattern of ICT tools and the suggestions to overcome the constraints faced by the ICT tools user farmers.

Rajashekar, B., Aruna, K., Rajashekhar, M., Reddy, T. P., Reddy, M. J. M. and Charan, G. S. (2022). Perception and Utilization Pattern of Information and Communication Technology Tools by the Farmers of Nagar Kurnool District. *Biological Forum – An International Journal, 14*(4), 1111-1114.

Rajneesh, S. M. and Sisodia, S. S. (2020). Impact of Mobile Phone Based Services on Rice Crop Management. *Indian Research Journal of Extension Education*, *20*(1), 51-54.

Sideridis, A. B., Koukouli, M, and Antonopoulou, E. (2010). ICT and farmers: lessons learned and future developments. *Journal of Agricultural Informatics*, *1*(2).

Sowjanya, S. (2017). *Analysis of Different Electronic Media in Farm Communication-An Experimental Study* (Doctoral dissertation, University of Agricultural Sciences, GKVK).

Spandana, B., Rani, B. J., Preethi, M., Aparna, K. and Chary, D. S. (2022). Obstacles Faced by Women Entrepreneurs in the use of ICTs. *Biological Forum – An International Journal, 14*(4), 895-897.

Vineetha, A., Sailaja, V. and Gopal, P. V. S. (2019). Marketing behaviour of groundnut farmers in Anantapuramu district of Andhra Pradesh. *Agriculture Update*, *14*(1), 47-51.

Vivek, M. C. and Sahana, S. (2021). Socio-economic characteristics of the farmers following e-tendering system for Arecanut in Karnataka. *Indian Research Journal of Extension Education*, *21*, 117-125.

How to cite this article: Sagar S. Pujar, Amaresh Kumar K., Sahana S., D. Shashikalabai and Sai Tejashree G. (2023). Opinion on Adoption and Effectiveness of Information and Communication Technologies in Crop Production. *Biological Forum – An International Journal, 15*(2): 651-655.