

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 1; January 2025; Page No. 158-161

Received: 20-10-2024
Accepted: 25-11-2024

Indexed Journal
Peer Reviewed Journal

Assessing the perceived benefits of information and communication technology for farmers in south Gujarat

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DOI: <https://doi.org/10.33545/26180723.2025.v8.i1c.1517>

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Abstract

Agriculture serves as the backbone of the Indian economy, and the 21st century is often referred to as the "Information Age" and that has significantly impacted this agriculture sector. Access to agricultural information is essential for optimizing production factors such as land, labour, capital, and management. In this the extension services, research institutions, and agricultural organizations play a crucial role in delivering relevant and reliable information that supports farmers' decision-making processes, ultimately boosting productivity. In this context, Information and Communication Technology (ICT) is emerging as a transformative force in agriculture, driving rural development in India. ICT applications provide farmers with timely and accurate information, enhancing their capabilities in areas such as agro-inputs, crop production technologies, market access, and financial management. This study investigates the perceived benefits of ICT usage among the farmers of South Gujarat, focusing on three districts: Navsari, Valsad, and Surat. A total of 300 farmers participated, with data collected through a structured interview schedule. The findings indicated that, among 28 assessed parameters categorized into managerial, operational, technical, and financial benefits, the most significant perceived advantage was the enhancement of decision-making power through modern ICT tools. Additional notable insights include the impact of agricultural information disseminated via television and the usefulness of the Kisan Call Centre's toll-free number for resolving agricultural queries. Overall, the study underscores the need for continued investment in ICT initiatives and infrastructure to further enhance the benefits for farmers.

Keywords: ICT, perceived benefits, agricultural information, south Gujarat

1. Introduction

ICT is a broad term that includes any communication device and applications such as radio, television, cellular phones, computer, hardware, software, satellite systems and many more as well as the various services and applications associated such as videoconferencing and distance learning. ICT is the integration of technologies and the processes that conveys the desired information to the target audience and making them more participative in nature by delivering accurate, complete, concise information on time in user friendly language, easy to access and cost effective.

Agricultural information spread awareness among farmers about adoption of new agricultural technologies. Therefore, the existence of robust agricultural information system is a necessity to support agricultural development. Information and Communication Technology plays a key role in agriculture. Farmers have always searched for ways to improve the crop production. Information plays a crucial role in empowering farmers and to improve their livelihoods. Major essential information related to sowing, improving soils, seeking the best price of their produce and tools and techniques to combat pests and diseases have helped the farmer and their decision making capabilities. Information and Communication Technology services provide access to the knowledge, information and technology that farmers require to boost the productivity

and to improve the quality of their lives and livelihoods. It is hence essential to deliver farmers the knowledge and information in a quality and timely way.

Farmers have sometime faced difficulties in searching the answers even after many years of experiences in the typical cropping system. Seasonal variability, weather patterns, deterioration in soil conditions and occasional climatic events such as drought, floods, pest and disease outbreaks affects the decision making process of the farmers and that influences the need of on time information. So, there is a quick need of adoption of vibrant, innovative, scientific and dynamic approach for agricultural development in order to serve farmers better and boost their livelihoods. Further, land and water resources are almost reaching their limits; hence, achieving food security strongly relies on a resource called "Knowledge".

In this ICT era, the conversation with one another has become so easy by just clicking a button and further the ICT can be best utilized for the transfer of technologies to the farming community in this background there have been number of ICT programmes and projects have been implemented by government and private sector to enable farmers to have access to the relevant information at a right time for the promotion of productivity among various crops. Positive and favorable attitude towards use of ICT is necessary to have positive perceived effectiveness of ICT in

agriculture among the farmers. Awareness and knowledge of farmers about the existing ICT projects and services and their relevance in agriculture are important factors that lead to positive perceived effectiveness of ICT among farmers in agriculture.

At this juncture, considering the importance of Digital India, a study entitled "Assessing the Perceived Benefits of Information and Communication Technology for Farmers in South Gujarat" is proposed. In this background the present study was undertaken with the following objective: A study on perceived benefits of ICT usage of selected farmers in the research area.

2. Materials and Methods

The present study was conducted in South Gujarat region. Out of total 7 districts in South Gujarat study covered three districts (Navsari, Valsad and Surat) of South Gujarat. Multistage sampling method was used. In a multistage sampling method the researcher divides the population into groups at various stages for better data collection, management, and interpretation. This method is often used to collect data from a large, geographically spread group of people in surveys. A total of 300 farmers from three districts of South Gujarat were selected randomly for the study. Out of 300 farmers, 100 farmers each were randomly selected

from Navsari, Valsad and Surat districts of South Gujarat. 5 farmers from 20 villages were randomly selected from 4 talukas of Navsari district based on their presence and availability. 5 farmers from 20 villages were randomly selected from 4 talukas of Valsad district based on their presence and availability. 5 farmers from 20 villages were randomly selected from 4 talukas of Surat district based on their presence and availability to make the total sample size of 300 farmers. The primary data with respect to the farmers using ICT tools were collected using separate interview schedule. A five point Likert type scale in two different ranges such as very low to very high and strongly agree to strongly disagree was used to collect information with regard to benefits to farmers by using ICT tools.

3. Results and Discussion

ICT can help an average Indian farmer to get relevant information regarding agro-inputs, crop production technologies, agro-processing, market support, agro-finance and management of farm agri-business. Therefore, an attempt has been made to find out the benefits of the use of ICT tools and applications perceived by farmers for acquiring agricultural information. The data in this regard were collected and presented in ranks on the basis of average score in table 1.

Table 1: Perceived benefits of ICT usage by farmers (n=300)

Sr. No.	Benefits	SA (5)	A (4)	M (3)	D (2)	SD (1)	CS	Mean Score	Rank
Managerial Benefits									
1	The decision making power increases through the appropriate use of modern ICT tools	145 (725)	103 (412)	32 (96)	16 (32)	4 (4)	1269	4.23	I
2	Information given to farmers through SMS helps to eliminate the difficulty on time	65 (325)	96 (384)	104 (312)	30 (60)	5 (5)	1086	3.62	VI
3	Computer and smart phone with internet facility are useful to avail the timely and needy information	61 (305)	109 (436)	84 (252)	42 (84)	4 (4)	1081	3.60	IX
4	Digital Portal improves the effectiveness of the field services by disseminating agricultural practices using a video as a medium is useful	51 (255)	107 (428)	103 (309)	26 (52)	13 (13)	1057	3.52	XXIII
5	More peoples can discuss the topic in a group by video conferencing	64 (320)	96 (384)	100 (300)	33 (66)	7 (7)	1077	3.59	XII
6	ICT helps to connect with potential customers	52 (260)	111 (444)	100 (300)	33 (66)	4 (4)	1074	3.58	XV
7	ICT helps to reduces the risk of wastage	48 (240)	117 (468)	93 (279)	33 (66)	9 (9)	1062	3.54	XIX
8	Increases farmers engagement and help in establishing links with market places and new customers	54 (270)	107 (428)	91 (273)	41 (82)	7 (7)	1060	3.53	XXI
9	ICT facilitates quick and easy access to market	54 (270)	111 (444)	90 (270)	28 (56)	17 (17)	1057	3.52	XXIII
10	ICT helps in gaining accurate and timely information	74 (370)	105 (420)	85 (255)	31 (62)	5 (5)	1112	3.70	IV
Operational Benefits									
11	Agricultural information shown on television programs by TV channels are more beneficial	57 (285)	158 (632)	70 (210)	15 (30)	-	1157	3.85	II
12	Different agricultural programmes broadcasted on radio are useful	58 (290)	102 (408)	114 (342)	22 (44)	4 (4)	1088	3.62	VI
13	Community radio service that provides information in interest of a certain areas are beneficial	85 (425)	97 (388)	65 (195)	49 (98)	4 (4)	1110	3.70	IV
14	The toll free telephone number 1800-180-1551 of Kisan Call Centre to get information about agricultural queries is useful	71 (355)	120 (480)	80 (240)	14 (28)	15 (15)	1118	3.72	III
15	Soil Health Card provides information of fertilizer recommendations and the nutrient requirements of crops of each field on the basis of soil analysis is useful	56 (280)	92 (368)	106 (318)	42 (84)	4 (4)	1054	3.51	XXVI
16	'KisanMitra' app provides the solution of cultivated crops, horticultural crops and animal husbandry problems	59 (295)	103 (412)	90 (270)	38 (76)	10 (10)	1063	3.54	IX
Technical Benefits									

17	Farmers living in the remote areas can also obtain information through mobile	58 (290)	109 (436)	102 (306)	24 (48)	7 (7)	1087	3.62	VI
18	Features of smart phone such as video communication, SMS, MMS is useful	52 (260)	112 (448)	92 (276)	41 (82)	3 (3)	1069	3.56	XVI
19	Various important information related to agricultural can be stored in computer and smart phones	54 (270)	100 (400)	101 (303)	38 (76)	7 (7)	1056	3.52	XXIII
20	Problems related to agriculture can be solved through video clips and photographs	62 (310)	98 (392)	98 (294)	31 (62)	11 (11)	1069	3.56	XVI
21	Web based search engines such as 'Google' and 'Yahoo' are used to find the information on the internet	54 (270)	115 (460)	94 (282)	30 (60)	7 (7)	1079	3.59	XII
22	Web based agricultural portals benefits the farmers	63 (315)	79 (316)	113 (339)	35 (70)	10 (10)	1050	3.50	XXVIII
23	Storage devices like hard disk drives, CD, DVD and pen drives are used for back up of crucial data for long time	64 (320)	99 (396)	96 (288)	35 (70)	6 (6)	1080	3.60	IX
24	Taking picture through digital camera and communicating could provide expert advice within time	64 (320)	91 (364)	107 (321)	36 (72)	2 (2)	1079	3.59	XII
25	Kiosk to facilitate agricultural information and education are beneficial	54 (270)	103 (412)	95 (285)	40 (80)	8 (8)	1055	3.51	XXVI
Financial Benefits									
26	ICT helps to gain accurate price of produce and assists in fast selling	63 (315)	92 (368)	109 (327)	23 (46)	13 (13)	1069	3.56	XVI
27	ICT is cheaper and faster medium of information	56 (280)	112 (448)	95 (285)	32 (64)	5 (5)	1082	3.60	IX
28	ICT helps to maximize profit ratio	53 (265)	102 (408)	104 (312)	34 (68)	7 (7)	1060	3.53	XXI

CS = Cumulative Score

It is evident from table 1 that majority of the farmers agreed that the decision making power had increased through the appropriate use of modern ICT tools and therefore it is ranked first with mean score 4.23 followed by agricultural information shown on television programs by TV channels was ranked second with mean score 3.85.

From the present study, it was clearly found that maximum farmers were taking benefit of the toll free telephone number 1800-180-1551 of Kisan Call Centre to get information about agricultural queries and hence it was ranked third with mean score 3.72.

It could also be revealed that maximum farmers agreed that community radio service that provides information in interest of a certain areas and broadcasting content is beneficial and ICT helps in gaining accurate and timely information and therefore both were ranked fourth with mean score 3.70 followed by different agricultural programmes broadcasted on radio were useful.

The parameters that different programmes broadcasted on radio are useful, farmers living in the remote areas can also obtain information through mobile and the information given to farmers through SMS helps to eliminate the difficulty on time were on rank sixth with mean score 3.62.

The present result stated that majority of the farmers were perceiving benefits of computer and smart phone with internet facility are useful to avail the timely and needy information and agreed that storage devices like hard disk drives, storage devices like CD, DVD and pen drives were used for back up of crucial data for long time and also agreed on that 'Kisan Mitra' app provides the solution of cultivated crops, horticultural crops and animal husbandry problems hence, all the three parameters were ranked ninth with mean score 3.60 each.

In the study area most of the farmers were also taking benefits of web based search engines such as 'Google' and 'Yahoo' which are used to find out the agriculture related information on the internet and also agreed that people

could discuss their topic in a group by video conferencing and taking pictures through digital camera and communicating that could help them to change the situation of field by getting expert advice within time hence, all the three parameters were ranked twelfth with mean score 3.59. The perceived benefits like ICT helps to connect with potential customers was on rank fifteenth with mean score 3.58 followed by the features of smart phone such as voice communication, SMS, MMS and capturing and sending photographs of crops was found useful, problems related to agriculture can be solved through video clips and photographs and ICT helps to gain accurate price of produce and fast selling were on rank sixteenth with mean score 3.56 each.

The data revealed that farmers were taking benefits of 'Kisan Mitra' app providing the solution of cultivated crops, horticultural crops and animal husbandry problems as well as benefits with other beneficial information and agreed that ICT helps to reduces the risk of wastage in this regard these parameters were rank nineteenth with mean score 3.54 each. It was followed by that ICT tools could increase the farmers engagement and establishing links with market places and new customers and also that ICT could help in maximizing profit ratio was on rank twenty first with mean score 3.53 each.

It was also agreed that various important information related to agricultural sector could be stored in computer and smart phones, digital portal improves the effectiveness of the field services by disseminating agricultural practices using a video as a medium was useful and quick and easy access to market hence, all the three parameters were ranked twenty third with mean score 3.52.

The result stated that the Soil Health Card provides information of fertilizer recommendations and the nutrient requirements of crops of each field on the basis of soil analysis it was useful and Kiosk to facilitate agricultural information and education was beneficial and were ranked

twenty sixth with mean score 3.51 followed by web based agricultural portals technology benefits the farmers was ranked twenty eighth with mean score 3.50.

4. Conclusion

From the present study, it can be concluded that majority of the farmers agreed that the decision making power had increased through the appropriate use of modern ICT tools, agricultural information shown on television programs by TV channels, the toll free telephone number of Kisan Call Centres to get information about agricultural queries is useful, ICT helps in gaining accurate and timely information and taking maximum benefit, different agricultural program broadcasted on radio are useful, farmers living in the remote areas can also obtain information through mobile and the information given to farmers through SMS helps to eliminate the difficulty on time, computer and smart phone with internet facility are useful to avail the timely and needy information, storage devices like hard disk drives, CD, DVD and pen drives are used for back up of crucial data for long time and 'Kisan Mitra' app provides the solution of cultivated crops, horticultural crops and animal husbandry problems, web based search engines such as 'Google' and 'Yahoo' are used to find the information on the internet, more peoples can discuss the topic in a group by video conferencing and taking picture through digital camera and communicating could provide expert advice within time, ICT helps to connect with potential customers were the perceived benefits of ICT tools.

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