Research in
AGRICULTURE, LIVESTOCK and FISHERIES
ISSN : P-2409-0603, E-2409-9325
An Open Access Peer-Reviewed International Journal

Article Code: 0382/2022/RALF
Article Type: Research Article

Res. Agric. Livest. Fish.
Vol. 9, No. 3, December 2022: 259-265.

EFFECTIVENESS OF AGRICULTURAL INFORMATION AND COMMUNICATION CENTER FOR DISSEMINATING AGRICULTURAL INFORMATION

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ARTICLE INFO

Received
26 September, 2022

Revised
27 December, 2022

Accepted
28 December, 2022

Online
January, 2023

Key words:
Effectiveness
AICC
ICT
Agricultural information

ABSTRACT

Nowadays, Information and Communication Technologies (ICT) are playing important role in communicating agricultural information. In this connection, the government of Bangladesh established a number of Agricultural Information and Communication Centers (AICC) at the Union level to disseminate agricultural information. The purposes of the study were to determine the effectiveness of AICC for disseminating agricultural information and to explore the contribution of the selected characteristics of the AICC member farmers to the effectiveness of AICC. Data were collected from 90 randomly selected farmers of nine Upazillas of Faridpur district under Dhaka division. Face-to-face interview followed by pretested structured questionnaire was held with the selected farmers to gather data. The survey revealed that an overwhelming majority (80%) of the farmers perceived medium effectiveness of AICC, while 7.8% of them perceived low and 12.2% of them perceived high effectiveness of AICC for disseminating agricultural information. The effectiveness of AICC was influenced by the intensity of use of ICT, length of experience to use ICT and ICT using confidence. Therefore, responsible organizations such as Agriculture Information Service (AIS) with the help of the Department of Agricultural Extension (DAE) and other advisory service-providing organizations should take action to enhance the effectiveness of AICC.

To cite this article: Setu S. B., M. S. Ali and M. H. Kabir, 2022. Effectiveness of agricultural information and communication center for disseminating agricultural information. Res. Agric. Livest. Fish. 9 (3): 259-265.

INTRODUCTION

Agriculture is a dynamic sector in Bangladesh that needs regular adoption of new farm technologies in order to meet the growing demands of food items. The sector is one of the largest producing sectors of the economy since it comprises about 13.40% of the country's GDP and employs around 40.6% of the total labor force (BBS, 2021). Agricultural production can only be increased if suitable technologies are used by the farmers, who are the primary unit of adoption of better practices (Kabir and Rainis, 2015). Therefore, for getting knowledge of the modern agricultural technologies, their usefulness, proper operation of these information and technologies messages should reach to the farmers within a shortest possible time. In relation to this, research indicates that the use of Information and Communication Technology (ICT) to disseminate agricultural technologies has been shown such effectiveness to improve agricultural production (Rahman and Islam, 2015).

Agricultural Information and Communication Center (AICC) is a novel idea for agricultural extension service delivery in Bangladesh that is based on information and communication technology (Das, 2015). AICC delivers up to date information on crop cultivation, animal and fish farming, local and worldwide market information, disaster management information and the dissemination of new agricultural technologies. Agriculture Information Service (AIS) under the Ministry of Agriculture, has a strategic goal to create AICC in each community (AIS, 2016). The AICC's main goals are to build e-agriculture, give ICT facilities to all types of farmers, and spread agricultural information through the media. Agricultural Extension services are critical for maintaining good productivity and efficient resource utilization in a country's agricultural sectors, as well as providing farmers with critical access to the knowledge, information, and technology they need to improve productivity and thus improve the quality of their lives and livelihoods (Feder *et al.,* 2010, Mishuk *et al.,* 2021). As a result, it is critical to offer farmers with high quality information and knowledge in a timely manner. The farm family to grassroots level extension agent ratio is 1000:1, which is extremely low (Rahman and Islam, 2015). As a result, both the government and the business sector should take steps to offer timely, need based information. The Ministry of Agriculture of the People's Republic of Bangladesh has previously made a number of measures. These include the establishment of AICC, the development of an agriculture related Bangla website, the establishment of a community radio station, the establishment of a mobile based agricultural extension service, the establishment of a call center, the launch of an e-book, the launch of an online farmer television channel, and the launch of an online fertilizer recommendation system, among other things (AIS, 2016). DAE personnel in Bangladesh have produced and used several apps such as Krishoker Janala, Krishikotha, Krishoker Digital Thikana, and Rice Knowledge Bnak apps made by BRRI and Krishi Projukti Bhandar apps developed by BARI (Krishi Dairy, 2017).

Information and Communication Technology (ICT) has emerged as a viable extension tool for strengthening development processes in general and agricultural development in particular (Kashem *et al.* 2010). The use of Information and Communication Technology (ICT) in providing farm information to the farming community has been discovered to be successful (Sultana et al., 2019). It could allow extension service providers to collect, store, retrieve, and transmit a wide range of information to crop producers, such as best practices, new technology, lower input and output costs, better storage facilities, improved transformation links and weather, among other things. The effective adoption of agricultural inputs, market decision making, and the acceptance of scientific methodologies can all be aided by the dissemination of pertinent information to farming communities (Kiplang *et al.,* 1999). It is critical to effectively disseminate information to agricultural and rural areas. Efficient farming is frequently built due to a limited ability to obtain knowledge and information in a timely and appropriate manner. As a result, closing the productivity gap between research stations and farmer' fields, the delivery of agricultural information services is critical. Recognizing this, AIS established AICC in several rural locations. In various parts of Bangladesh, 499 AICCs have been created (Krishi Dairy, 2017). But what extent AICC is effective to deliver timely and useful information to the farmers is not studied.

Therefore, the researchers felt necessary to conduct a study to examine the effectiveness of AICC with the following objectives:

1. To determine the effectiveness of Agricultural Information and Communication Center (AICC) for disseminating agricultural information;
2. To describe some selected characteristics of the farmers who are members of AICC and
3. To explore the contribution of the selected characteristics of the farmers to their effectiveness of AICC.

MATERIAL AND METHODS

Area, Population and Sample

The study focuses in Faridpur district. The district is in south-central of Bangladesh. The district has nine upazilas. The activities of AICC exist in all upazilas but with selected area and farmers. There were 449 farmers as AICC member of 9 upazillas of Faridpur district which constituted the population of the study. Ninety (90) farmers were selected as the sample for the study by taking 20% of the population (Haque et. Al., 2016; Mishuk et al., 2021). Multistage sampling technique was applied to select study villages and respondents. The study area was selected purposively while the farmers were selected randomly. Data were collected using a pre-tested structured questionnaire by face-to-face interview during January, 2021.

Measurement of variable

The study considered both independent and dependent variables. Seven (7) independent variables were selected through review related literature. These are farmers' age, education, annual income, ICT ownership, ICT using experience, Use of ICT and ICT using confidence.

Effectiveness of AICC was the dependent variable of this study. It was measured on the basis of opinion provided by farmers regarding the effectiveness of AICC. Twelve items were considered to determine the effectiveness of AICC for disseminating agricultural information. A four-point rating scale was used to measure the extent of effectiveness of AICC by farmers. The scores of '3', '2', '1', and '0' were assigned to indicate the extent of effectiveness as 'highly effective', 'moderately effective', 'low effective' and 'not at all effective' respectively. The possible range of the effectiveness score was 0 to 36 where '0' indicated 'not effective' and '36' indicated 'highest effective'. An Effectiveness Index (EI) was also computed for each effectiveness item by using the formulae:

$$EI = f_h \times 3 + f_m \times 2 + f_l \times 1 + f_n \times 0$$

Where, EI= Effectiveness Index

f_h = Frequency of respondents perceived high effectiveness

f_m= Frequency of respondents perceived moderate effectiveness

f_l= Frequency of respondents perceived low effectiveness

f_n= Frequency of respondents perceived not at all effectiveness

Statistical Treatment

Finally, the collected data were coded and analyzed using Statistical Package for Social Science (SPSS) ver. 20 and Microsoft Excel ver. 13. The findings were presented in the form of descriptive statistics, that is percentage (%), mean and standard deviation. Due to misleading results from multi-collinearity, the Step-wise multiple regression was used to find out the contribution of the independent variables separately to the dependent variable.

RESULTS AND DISCUSSION

Effectiveness of AICC for disseminating agricultural information

Results from the analysis of the extent of perceived effectiveness of AICC for disseminating agricultural information presented are in Table 1. The observed scores of the effectiveness of of AICC for disseminating agricultural information as perceived by the farmers ranged from 8 to 29 against possible range from 0 to 36. The average and standard deviation of the data distribution were found 19.42 and 4.18, respectively. The results indicate that, overwhelming majority (80%) of the farmers perceived the level or degree of AICC effectiveness as moderately effective, while 7.8% of them perceived low effectiveness and 12.2% of them perceived as highly effective of AICC for disseminating agricultural information. The finding is similar with the study of Islam *et al.,* (2019a). Probably the farmers don't get their desired information from AICC at a full extent which might be reason behind the findings that majority of the farmers commented AICC was moderate effective. On the other hand, the farmers who mentioned as high effective may be had regular contact with AICC.

Table 1. Distribution of the farmers according to their views on the effectiveness of AICC

Category	Respondents		Mean	SD
	Number	Percent		
Lower effective (up to 12)	7	7.8	19.42	4.18
Medium effective (13-24)	72	80.0		
Highly effective (above 24)	11	12.2		
Total	90	100		

Item-wise Effectiveness of AICC for disseminating Agricultural Information

An item wise analysis was also done to compare the items based on the descending order of the Standardized Effectiveness Index (SEI) value. Data presented in Table 2 shows that "usability of information" ranked first and denoted as highly effective. Whereas, the 'solving farming problems was ranked second (191). Furthermore, the '"getting farming information" was also considered to be effective and was ranked third. 'Getting agricultural product selling price' was recognized as the least effective (70) of AICC for disseminating agricultural information since it was ranked 12th. This may be due to the fact that AICC give more emphasis to solve farm problem rather marketing issue. Hasan et al., (2017) mentioned that ICT based organization prefer to provide farm management information than others.

Table 2. Effectiveness Index (EI) of the statements with Rank Order

Effectiveness	Extent of effectiveness with number of respondents				SEI	Rank Order
	Highly effective	Moderately effective	Low effective	Not at all effective		
Getting farming information	15	70	5	0	190	3rd
Getting weather information for better agriculture	0	8	61	21	77	9th
Getting use of natural resources information	0	9	53	28	71	10th
Getting agricultural input price information	0	10	50	30	70	11th
Getting agricultural product selling price	0	8	48	34	64	12th
Solving farming problems	22	57	11	0	191	2nd
Usefulness of farming information	16	67	7	0	189	4th
Developing farming condition	3	73	14	0	169	8th
Clarity of information	10	70	10	0	180	5th
Completeness of information	11	64	15	0	176	6th
Understandability of information	11	63	16	0	175	7th
Usability of information	29	48	13	0	196	1st

Selected Characteristics of the Farmers

Characteristics profile of the respondent farmers includes age, education, annual family income, ICT ownership, ICT using experience, ICT using confidence, and Use of ICT.

Salient features of the characteristics of the respondents presented in Table 3 shows that the highest proportion (42.2%) were in the middle-aged while 43.4% percent of the farmers had secondary education in the study area. The majority proportion of the farmers (54.5%) were in medium income category, where 13.3 percent and 32.2 percent of them were in low and high-income category, respectively may indicating the better condition in the study area. The highest proportion (52.2%) of the respondents belonged to medium ICT ownership while majority proportion (45.6%) of the respondents had high ICT using experience. The majority proportion (47.8%) of the respondents had high ICT using confidence while half (50%) of the respondents had medium use of ICT.

Table 3. Descriptive statistics and salient features of respondents (n=90)

Characteristics	Scoring system	Range		Respondent categories	Respondent's percentage (n=90)
		Possible	Observed		
Age	Years	-	20-80	Young (up to 35)	30.0
				Middle aged (36-50)	42.2
				Old (above 50)	27.8
Education	Years of schooling	-	0-17	Can't read or sign (0)	1.1
				Can sign only (0.5)	11.1
				Primary (1-5)	22.2
				Secondary (6-10)	43.4
				Above secondary (>11)	22.2
Annual family Income	'000' Tk.	-	50-1500	Low (up to 100)	13.3
				Medium (100-300)	54.5
				High (above 300)	32.2
ICT Ownership	Score	0-6	1-6	Low (up to 2)	26.7
				Medium (3-4)	52.2
				High (above 4)	21.1
ICT Using experience	Score	-	1-20	Low (up to 5)	15.6
				Medium (6-10)	38.8
				High (above10)	45.6
ICT Using confidence	Score	0-30	4-30	Low (up to10)	21.1
				Medium (11-20)	31.1
				High (above 20)	47.8
Use of ICT	Score	0-28	4-23	Low (up to 9)	36.7
				Medium (10-18)	50.0
				High (above 18)	13.3

Step-wise multiple regression analysis

Stepwise regression analysis was employed to understand the contribution of the farmers selected characteristics (seven) on the effectiveness of AICC (Kabir et al., 2017). The output of step-wise regression analysis is presented in Table 4. The findings revealed that out of seven variables, three variables namely use of ICT, ICT using experience and confidence on ICT use were found positive and significantly contributed on the effectiveness of AICC. These three variables explained about 54 percent of the total variation to the effectiveness of AICC.

Table 4. Summary of stepwise regression analysis showing the contribution of all seven (7) independent variables to the effectiveness of AICC

Variables entered	Standardized Partial 'b' coefficient	Value of 't' (with probability level)	Adjusted R^2	Increase in R^2	Variation explained in percent
Use of ICT	0.345	2.980 (0.004)	0.472	0.472	47.2
ICT using experience	0.246	2.276 (0.025)	0.521	0.049	4.90
ICT using confidence	0.237	2.094 (0.039)	0.539	0.018	1.80
Total				**0.539**	**53.9**
R-square = 0.555 Adjusted R - square = 0.539 F-ratio = 35.728 at 0.000 level of significance					

The findings indicate use of ICT variable which made highest contribution (47.2%) to the effectiveness of AICC to communicate agricultural information. This implies that the farmers who used more ICT found AICC more effective. This may be due to the fact that using ICT tools could be a useful option to get access of agricultural information through AICC. Sultana et al., (2019) also found that use of ICT help farmers in accessing agricultural information through Krishoker Janala (a crop-based app). Therefore, to increase the effectiveness of AICC, the users of ICT tools should be increased by reducing the logistical challenges of using ICT tools at local level.

The findings also indicate that about 4.9% of the variation in effectiveness was explained by ICT use experience of the farmers. This suggests that ICT use experienced farmers perceived AICC more effective than other farmers (who did not have long experience in using ICT). Long farming experience help farmers to identify the pros and cons of farming that make a farmer more efficient in farming (Islam et al., 2019b). Similarly, like farming experience, a farmer with longer experience with using ICT tools may understand the pros and cons of a digital service system like AICC. This understanding of using ICT tools may help farmers to get better service from AICC. In addition, the finding also reveals that ICT using confidence had positive and significant contributing relationship with the effectiveness of AICC for disseminating agricultural information. This indicates that farmers who were more confident to use ICT tools perceived AICC is more effective. This may be because of having better confidence level of farmers in using ICT tools may provide opportunities to overcome the problem in accessing and utilization of agricultural information from AICC.

CONCLUSIONS

ICT based approach like AICC can play an important role in disseminating agricultural information where the scope to face to face contact by the extension agent with the farmers are limited. This study has aimed to assess the effectiveness of AICC in communicating agricultural information with the farmers. This study confirmed that majority (80 percent) of the respondents considered AICC as moderately, 7.8 percent of the respondents perceived as low effective and 12.2 percent perceived as highly effective, which indicates effectiveness of the AICC in disseminating agricultural information as perceived by the farmers was not highly satisfactory in the study area. The degree of effectiveness of the AICC on disseminating agriculture information mostly influenced by three selected characteristics such as use of ICT tools, ICT use experience and ICT using confidence. It is therefore essential to embed and combine ICT platforms with more traditional media and extension methods by the service providing organizations involved in disseminating agriculture related information such as the Department of Agricultural Extension (DAE), along with other related organizations like Agricultural Information Service (AIS), private companies and NGOs. Moreover, ICT interventions require ongoing support from the service preceding organizations in accessing and using agriculture related information at local level. This may help to increase the effectiveness of AICC in providing agricultural information to the farmers.

ACKNOWLEDGEMENT

We are grateful to the AICC farmers of Faridpur district for their cordial response while data collection period. We also extended our thanks to the AICC officials, respective union and Upazila level agriculture officer.

COMPETING INTEREST

The authors declare that they have no competing interests.

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