

Effectiveness of Khetkhamar Program of Lokobetar for Disseminating Farm Information

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ABSTRACT

This research aimed to investigate the effectiveness of 'Khetkhamar (agricultural)' program of the community radio 'Lokobetar' for disseminating farm information, explore the contribution of the selected characteristics of the listener farmers to their perceived effectiveness of Lokobetar; and determine the severity of problems faced by them in getting agricultural information through Lokobetar. Data were collected from randomly selected 110 listener farmers of this radio from 'Sadar' upazila of Barguna district. The majority (60.9%) of the listener farmers perceived moderate effectiveness, and the remaining 39.1% perceived high effectiveness. Again, the majority (62.5%) of the Agricultural Advisory Service Providers perceived moderate effectiveness, and rest 37.5% of them perceived high effectiveness of this agricultural radio program for disseminating farm information. Among the dimensions of effectiveness items, 'timeliness of information' ranked 1st followed by 'adequacy of information', 'reliability of information', and 'usability of information'. 'Time spent in farming', 'attitude towards Lokobetar, and 'education' of the Lokobetar listening farmers had a positive contribution to their perceived effectiveness of Lokobetar for disseminating farm information. 'Lack of radio for listening' ranked 1st problem, followed by 'weakness of network/signal', 'limited time for broadcasting', 'lack of feedback facility after listening', 'lack of suitability of broadcasting time', 'lack of usability of information', 'lack of reliability of information', 'inadequacy of information', and 'obscurity of voice'. Based on these findings, it may be said that agricultural programs containing usable, dependable, and detailed information on innovations should be broadcast at a suitable time. Supplying radios to the listener farmers' club, strengthening the network/signal capacity, increasing broadcasting time, and providing a feedback facility with the farmers can increase the effectiveness of the program for disseminating farm information.

Keywords: Effectiveness, Khetkhamar program, Lokobetar, Disseminating farm information

INTRODUCTION

Dissemination of farm information is critically important for the agricultural development of a country. Generally, agricultural advisory service providers and farmers use different types of individual, group, and mass media like television, information communication tools, image-based plant disease detection apps, etc. for the dissemination of farm information. Roy *et al.* (2008) revealed that about one half of the respondents perceived mass media as medium effective, while a little higher than one third of the respondents perceived mass media as

highly effective, and the rest of the respondents considered it as low effective. Sultana *et al.* (2019) revealed that 64.2% of the Sub Assistant Agriculture Officers (SAAOs) of the Department of Agricultural Extension (DAE) in Bangladesh perceived that the use of *Krisoker Janala* (an image-based plant disease detection app) was moderately effective, while 24.5% and 11.3% of them perceived it as less and highly effective, respectively, for disseminating farm information. Setu *et al.* (2023) revealed that an overwhelming majority (80%) of the farmers perceived medium effectiveness of the Agricultural Information and Communication Center (AICC), while 7.8% of them perceived low and 12.2% of them perceived high effectiveness of AICC for disseminating agricultural information. Setu *et al.* (2022) again reported that farmers' use of ICT had the highest direct effect (0.345) in the positive direction, followed by ICT using experience (0.245) and ICT using confidence (0.237) on the effectiveness of AICC.

Nowadays, community radio has become popular in recent years as the information disseminating media medium of root-level people of the disadvantaged areas, and it has opened a new arena for both the policy makers as well as grassroots people to be involved in the development process of their community. Recognized by UNESCO (2021) as the 'Third Pillar' of the media landscape, community radio functions as an autonomous entity distinct from public and commercial sectors, specifically catering to the needs of local areas. It is a medium of expressing and sharing views, thoughts, ideas, problems, and prospects of the rural, disadvantaged, vulnerable, and hard-to-reach population with the mainstream population. There are about 18 community radios broadcasting 135 hours of programs in a day in Bangladesh (Khan *et al.*, 2017). Lokobetar is one of them, situated at Sadar upazila under Barguna district in Bangladesh. This community radio station, named as 'Lokobetar' (FM 99.2) is operated by the non-governmental organization Massline Media Centre (MMC).

Lokobetar can play a significant role at the grassroots level for rural development, including poverty reduction, agriculture, gender inequality, education, social problems, etc. In exploring the importance of sharing information locally and the opening of wider information networks for farmers in Northern Ghana with reference to vernacular radio programs, Chapman *et al.* (2003) found that rural radio is effective in improving the sharing of agricultural information by remote rural farming communities. Community radio initiatives in India have been found to facilitate better market access for farmers while also promoting sustainable agricultural practices and empowering marginalized rural communities (Aware *et al.*, 2024). Community radio serves as a critical agricultural extension tool in Bangladesh, bridging the gap for marginalized farmers. Its importance is codified in the National Agricultural Policy 2018 and the National Agricultural Extension Policy 2020, both of which mandate the use of community broadcasting to enhance advisory services and ensure timely knowledge transfer to rural areas (MoA, 2018; DAE, 2020).

Radio in this regard provides a set of participatory communication techniques that support agricultural extension efforts by using local languages to communicate directly with farmers and listeners' groups. Using the Most Significant Change (MSC) process, Waters *et al.* (2011) assessed the impact of community radio in Indonesia and concluded that effective radio activities can make a significant change in a community's life.

On 8 March 2008, the Government of Bangladesh (GoB) has given approval of the "Community Radio Installation, Broadcast and Operation Policy". The principal purpose of the policy was to open the radio spectrum to community broadcasting to explore the potentialities of community radio. As GoB is emphasizing decentralization of media which has been reflected in the issuing of licenses for Community Broadcasting and Policy, to facilitate and encourage people's privileges, to build a platform for community-level communication and sustainable development, through the accumulation of communities' energies, views and thoughts, initiatives, and resources. Earlier, in the 1st phase on 22 April 2010, the Ministry of Information gave approval to 14 community radio stations in Bangladesh.

Presently, 18 community radio stations have entered a new era by rural broadcasting within a listeners' community. Bangladesh Community Radio Association (BCRA) is a platform of all community radios of Bangladesh that works for strengthening the community radio sectors through lobbying, policy advocacy, coordination, networking, sharing and partnership with government, donors, networking bodies, expert groups, and community Radio initiators. 'Lokobetar' of Barguna Sadar, Barguna is broadcasting agricultural farm information by the 'Khetkhamar' program for the farmers.

The program Khetkhamar is broadcast once per week, with a typical duration of approximately 30 minutes. It generally addresses contemporary and pressing issues across the broader agricultural sector, including crops, fisheries, and livestock. Each episode usually focuses on a single topic, such as modern cultivation techniques for a specific vegetable or fish production practices. Episodes commonly include a mix of farmer interviews, expert question-and-answer segments, drama, songs, and short feature presentations, although some segments are omitted depending on the topic and context.

To highlight the importance and effectiveness of community radio for the community development of Bangladesh, Khan *et al.* (2017) conducted a study to explore the importance of community FM radio in Bangladesh, particularly in remote and rural areas, and reported that community radio can help in addressing social, economic, cultural, educational, health, water and sanitation, and disaster-related issues more effectively and strategically. Empirical studies in coastal regions of Bangladesh demonstrate that community radio functions as a primary communication infrastructure, facilitating agricultural knowledge transfer and disaster response for rural smallholders (Hasan *et al.*, 2025). Besides this, very few research works have been tried to identify the effectiveness of community radio for disseminating farm information and problems faced in broadcasting agricultural farm information by community radio. Therefore, this research aims to investigate “Effectiveness of Khetkhamar program of Lokobetar for disseminating farm information” as perceived by the listener farmers on the following objectives:

- To determine the effectiveness of Khetkhamar program of Lokobetar for disseminating farm information as perceived by the listener farmers and agricultural advisory service providers (AASPs),
- To assess and describe some selected socio-economic characteristics of the listener farmers of Khetkhamar program of Lokobetar,
- To explore the contribution of the selected characteristics of the listener farmers to their perceived effectiveness of Khetkhamar program of Lokobetar for disseminating farm information, and
- To determine the problems faced by the listener farmers in getting agricultural information through Khetkhamar program of Lokobetar.

MATERIALS AND METHODS

Locale of the Study: The study was conducted at Barguna sadar upazila under Barguna district. Lokobetar radio mainly serves a definite community to reflect their culture, ideology and thoughts, norms, and values, etc. Among 18 community radios of Bangladesh, ‘Lokobetar’ is broadcasting agricultural farm information by ‘Khetkhamar’ program for the farmers of sadar upazila of Barguna district. The radius of the broadcasting area of Lokobetar is 25 kilometers, covering 12 upazilas of Barguna, Patuakhali, and Bagerhat districts. Sadar upazila of Barguna district was selected purposively as the locale of the study as ‘Lokobetar’ is broadcasting from sadar upazila of Barguna district.

Population of the Study: Due to time and resource constraints, the exact number of listener farmers of ‘Lokobetar’ could not be determined. From the Lokobetar stations, it was known that it had 70 listener farmers’ clubs. Out of which, 13 clubs were situated at Barguna sadar upazila of Barguna district. A total of 220 Listener farmers of these 13 clubs constituted the population of the study.

Sample of the study: Due to time and funding constraints, data were collected from the sample farmers rather than the population. As such, 110 listener farmers out of 220 (50% of the total population) were selected as the sample of the study by using a proportionate random sampling method from the selected clubs.

Data Collecting Instrument: For collecting data, an interview schedule was prepared keeping the objectives of the research in mind. The schedule contained both open and closed-form questions. Most of the questions were simple and direct, while some scales were included in the schedule to collect data regarding the effectiveness of Lokobetar for disseminating farm information and relevant matters. The draft schedule was prepared in Bangla and pre-tested before using it for the final collection of data. Based on the pre-test experience, necessary corrections, additions, alterations, and rearrangements were made to finalize the schedule.

Measurement of effectiveness of Khetkhamar programs of Lokobetar for disseminating agricultural information: Effectiveness of Khetkhamar (agricultural) programs of Lokobetar for disseminating farm information was the focus (dependent) variable of this study. Respondent listener farmers were asked to indicate the degree of effectiveness of Khetkhamar (agricultural) programs of Lokobetar on each of four (4) selected items of effectiveness like ‘timeliness of information’, ‘adequacy of information’, ‘reliability of information’ and ‘usability of information’ by scoring as 3, 2, 1 and 0 for highest, moderate, low and no effective, respectively. Thus, scores of effectiveness of Khetkhamar program of Lokobetar for disseminating farm information as perceived by the respondent listener farmers could range from 0-12, where ‘0’ indicates no effectiveness and ‘12’ indicates the highest effectiveness. The same scale was used to determine the effectiveness of Lokobetar as perceived by the local AASPs, including Upazila Agriculture Officer, Agricultural Extension Officer, and Sub-Assistant Agricultural Officers of the upazila.

Standardized Effectiveness Index: To compare the effectiveness of the items, the Effectiveness Index (EI) of each of the four (4) items was determined by using the following formula:

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

Where, EI = Effectiveness Index

f_h = frequency of the respondents perceived as the highest effective

f_m = frequency of the respondents perceived moderate effective

f_l = frequency of the respondents perceived low effective

f_n = frequency of the respondents perceived not at all effective

Thus, EI of the items could range from 0-330 (as the number of respondents was 110 and the highest score was 3), where ‘0’ indicates not at all effective and ‘330’ indicates the highest effective.

Based on the EI, the Standardized Effectiveness Index (SEI) of each of the four (4) items was determined by using the following formula:

$$SEI = \frac{\text{EI of the item}}{\text{Highest possible EI of the items (i.e., 330)}} \times 100$$

Thus, SEI of the items could range from 0-100, where ‘0’ indicates not at all effective and ‘100’ indicates the highest effectiveness of the item for disseminating farm information. Rank order was made based on the descending order of SEI of the items.

Measurement of Independent Variables: Ten characteristics of farmers were selected as the independent variables of the study. Measuring procedures of the variables are briefly presented below:

Age: Actual age in complete years at the time of interview from date of birth

Education: One (1) score for one (1) year of successful schooling, Zero (0) for illiterate, and 0.5 for can sign only

Agricultural farm size: Agricultural (including crop, livestock, and fisheries) farm size in acre

Agricultural farming experience: Agricultural (including crop, livestock, and fisheries) farming experience in complete years

Time spent in agricultural farming: Hour(s)/day spent in agricultural (including crop, livestock, and fisheries) farming

Species grown: Total number of species grown or reared for agricultural (including crop, livestock, poultry, and fisheries) production

Annual income from agricultural farms: Annual income of the family members from agricultural (including crop, livestock, and fisheries) farms in thousand ('000') Bangladeshi Taka (BDT.)

Individual contact: Scores as 3, 2, 1, and 0 for regular, occasional, rare, and not at all contact for each of the seven (7) selected individual extension media contacts

Mass contact: Hour(s)/week reading print materials (agricultural information from newspapers, books, magazines, etc.); watching agricultural programs on television; and listening to agricultural program from radios

Attitude towards Khetkhamar program of Lokobetar: Scores as 2, 1, 0, -1, and -2 for strongly agree, agree, no opinion, disagree, and strongly disagree with each of five (5) selected positive attitudinal statements towards the effectiveness of Khetkhamar program of Lokobetar for disseminating agricultural information, and reverse scores for five (5) selected negative statements

Problem faced in getting information

The problem faced by the listener farmers of Khetkhamar program of Lokobetar radio was determined by requesting them to indicate the degree of problems faced by them for getting farm information on each of nine (9) selected items of problems by scoring as 3, 2, 1, and 0 for severe, moderate, low, and no problem, respectively. Thus, scores of problems faced by the listener farmers of Lokobetar radio for getting farm information could range from 0-27, where '0' indicates no problem and '27' indicates the highest problem.

Standardized Problem Faced Index: To compare the severity among the problem items, the Problem Faced Index (PFI) of each of the nine (9) items was determined by using the following formula:

$$PFI = f_s \times 3 + f_m \times 2 + f_l \times 1 + f_n \times 0$$

Where, PFI = Problem Faced Index

f_s = frequency of the respondents faced severe problem

f_m = frequency of the respondents faced moderate problem

f_l = frequency of the respondents faced low problem

f_n = frequency of the respondents faced not at all problem

Thus, PFI of the items could range from 0-330 (as the number of respondents was 110 and the highest score was 3), where '0' indicates not at all problem and '330' indicates the highest problem.

Based on the PFI, the Standardized Problem Faced Index (SPFI) of each of the nine (9) items was determined by using the following formula:

$$SPFI = \frac{\text{PFI of the item}}{\text{Highest possible PFI of the items (i.e., 330)}} \times 100$$

Thus, SPFI of the items could range from 0-100, where '0' indicates not at all problem and '100' indicates the highest problem of the item for getting agricultural information. Rank order was made based on the descending order of SPFI of the items.

Theoretical framework

In the present study, the effectiveness of Khetkhamar program of Lokobetar was considered as the dependent variable and selected socio-economic characteristics of the listeners' farmers were considered as the independent

variables. Listeners might face different problems in getting information from Lokobetar. These problems might be minimized by the recommendations made by this piece of research. Keeping these facts in mind, a simple conceptual framework for the study was prepared and is presented in Figure 1.

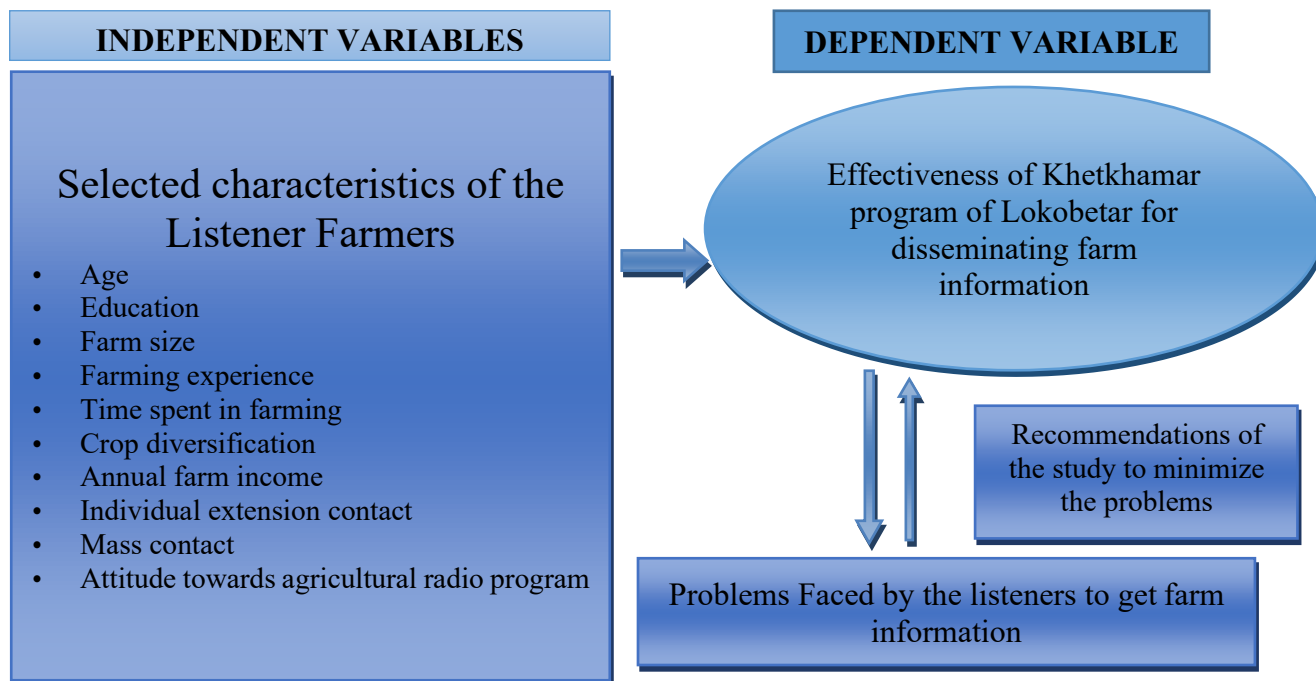


Figure 1. Conceptual Framework of the Study

RESULTS AND DISCUSSION

Effectiveness of Khetkhamar program of Lokobetar for disseminating farm information as perceived by the listener farmers: The score of effectiveness of Khetkhamar program of Lokobetar for disseminating farm information as perceived by the listener farmers ranged from 5 to 12 against the possible range of 0-12 with the mean and Standard Deviation (SD) of 8.49 and 1.34, respectively. Respondent listener farmers were classified into two groups based on their perception of the effectiveness of Khetkhamar program of Lokobetar for disseminating farm information, as shown in Table 1.

Table 1. Distribution of the listener farmers according to their perceived effectiveness of Lokobetar for disseminating farm information

Categories	Basis of categorization (Score)	Respondent		Mean	SD
		Number	Percent		
Low Effective	0-4	0	0.0	8.49	1.34
Moderate Effective	5-8	67	60.9		
High Effective	9-12	43	39.1		
Total		110	100		

Table 1 revealed that the majority (60.9%) of the respondent listener farmers perceived moderate effectiveness of Khetkhamar (agricultural) programs of Lokobetar, and rest 39.1% of them perceived high effectiveness of the agricultural program of Lokobetar radio for disseminating farm information. None of the farmers perceived low effectiveness of the program, which reflected the genuine quality of the program. This might be due to that all the sample farmers were members of listener clubs of the radio. Khan *et al.* (2017) reported that community radio can help the listeners in addressing social, economic, cultural, educational, health, water and sanitation, and disaster-related issues more effectively and strategically. Das *et al.* (2019) revealed that radio had an

effective role in improving awareness and increasing the modern technological knowledge of farmers, and helped them to access marketing information. Waters *et al.* (2011) assessed the impact of community radio in Indonesia and concluded that effective radio activities can make a significant change in a community's life. Chapman *et al.*, (2003) also found that rural radio was effective in improving the sharing of agricultural information by remote rural farming communities. All the previous findings were more or less similar. Based on the findings of the present research, it can be said that there is scope to increase the effectiveness of Khetkhamar program of Lokobetar for disseminating farm information.

Effectiveness of Khetkhamar program of Lokobetar for disseminating farm information as perceived by the AASPs: The score of effectiveness of Khetkhamar program of Lokobetar for disseminating farm information as perceived by the agricultural advisory service providers (AASPs) ranged from 6 to 10 against the possible range of 0-12, with the mean and Standard Deviation (SD) of 8.06 and 1.24, respectively. AASPs were classified into two groups based on their perception on the effectiveness of the program for disseminating farm information, as shown in Table 2.

Table 2. Distribution of the AASPs according to their perceived effectiveness of Lokobetar for disseminating farm information

Categories	Basis of categorization (Score)	Respondent		Mean	SD
		Number	Percent		
Low Effective	0-4	0	0.0	8.06	1.24
Moderate Effective	5-8	10	62.5		
High Effective	9-12	6	37.5		
Total		16	100		

Table 2 revealed that majority (62.5%) of the respondent AASPs perceived moderate effectiveness of Khetkhamar (agricultural) programs of Lokobetar and rest 37.5% of them perceived high effectiveness of this agricultural programs for disseminating farm information. Like farmers, none of the AASPs perceived low effectiveness of the program.

Comparison between the perception of listener farmers and AASPs: To compare the perception between the listener farmers and the AASPs on the effectiveness of Lokobetar for disseminating farm information, simple t-test was run, and t-value was found as 1.238 with 124 df at 0.218 level of significance, i.e., non-significant at 0.05 level. It means that there was no significant difference between the perception of listener farmers and AASPs on the effectiveness of Khetkhamar program of Lokobetar for disseminating farm information though the mean of perceived effectiveness of the farmers and AASPs were 8.49 and 8.06, respectively. This finding again revealed that the effectiveness of Lokobetar for disseminating farm information, as perceived by the listener farmers was like the perception of the Agricultural Advisory Service Providers.

Item-wise effectiveness of Khetkhamar program of Lokobetar for disseminating farm information: To compare effectiveness of four selected items, Effectiveness Index (EI) and Standardized Effectiveness Index (SEI) were determined as described in methodology section. Based on descending order of SEI, rank order was made as shown in Table 3.

Table 3. Item-wise effectiveness of Khetkhamar program of Lokobetar for disseminating farm information with rank order as perceived by the listener farmers

Items	No. of respondents perceived					EI	SEI	Rank Order
	High Effective	Moderate Effective	Low effective	Not at all effective	Total			
Timeliness of information	63	47	0	0	110	283	85.76	1

Adequacy of information	31	63	16	0	110	235	71.21	2
Reliability of information	19	85	6	0	110	233	70.60	3
Usability of information	13	50	45	2	110	184	55.76	4

Based on descending order of Standardized Effectiveness Index (SEI), ‘Timeliness of information’ ranked 1st followed by ‘Adequacy of information’, ‘Reliability of information’, and ‘Usability of information’. Based on these findings, it may be said that agricultural programs containing usable, dependable, and detailed information on innovations should be broadcast at a suitable time.

Selected socio-economic characteristics of the Khetkhamar program of Lokobetar listener farmers: Salient features of the selected characteristics of the respondent Lokobetar listener farmers are presented in Table 4.

Table 4. Salient features of the selected characteristics of the Khetkhamar program of Lokobetar listener farmers

Characteristics	Possible range	Observed range	Mean	Standard deviation
Age (Years)	Unknown	24-70	43.20	11.20
Education (Schooling years)	Unknown	0-12	5.49	3.60
Farm size (Acre)	Unknown	0.23-6.83	2.89	1.34
Farming experience (Years)	Unknown	10-50	24.63	9.33
Time spent in farming (hour/day)	Unknown	2-10	6.00	2.12
Crop diversification (Number)	Unknown	7-23	13.95	2.76
Annual farm income (‘000’ BDT.)	Unknown	70-160	118.26	20.25
Individual extension contact (score)	0-21	3-17	8.63	1.51
Mass contact (hour/week)	Unknown	1-12	2.35	1.85
Attitude towards Khetkhamar program of Lokobetar (score)	-20 to 20	1-18	11.76	3.80

Mean value of the selected characteristics revealed that the Lokobetar listener farmers were more or less middle aged, having primary to secondary level of education, medium farm size, higher agricultural farming experience, moderate time spent in agricultural farming, growing or rearing moderate number of species in agricultural (crop, livestock, poultry & fisheries) farm, medium farm annual income, moderate individual contact, lower mass contact and moderate favorable attitude toward Khetkhamar program of Lokobetar.

Contribution of the selected characteristics of the listener farmers to their perceived effectiveness of Khetkhamar program of Lokobetar: Pearson product moment correlation test was initially run to test the relationships between each of the selected characteristics of the listener farmers and their perceived effectiveness of Khetkhamar program of Lokobetar for disseminating farm information. Correlation analysis showed that out of ten (10) characteristics of the respondent listener farmers, five (5) had a significant relationship with their perceived effectiveness for disseminating farm information. The characteristics of the listener farmers, viz., education, farm size, time spent in farming, mass contact, and attitude towards Khetkhamar program of Lokobetar had a significant positive relationship with their perceived effectiveness. However, rest five (5)

characteristics, viz., age, farming experience, crop diversification, annual farm income, and individual extension contact of the listener farmers had a non-significant relationship with their perceived effectiveness.

Full model multiple regression analyses were then run by involving the selected characteristics of the listener farmers like age (X_1), education (X_2), farm size (X_3), farming experience (X_4), time spent in farming (X_5), crop diversification (X_6), annual farm income (X_7), individual contact (X_8), mass contact (X_9), and attitude towards Khetkhamar program of Lokobetar (X_{10}) as independent variables with their perceived effectiveness of Khetkhamar program of Lokobetar for disseminating farm information as the dependent variable (Y).

It was observed that the full model regression results were misleading due to the existence of interrelationships among the independent variables and the existence of a contradiction in the sign of the correlation coefficient and the regression coefficient. On the other hand, selected characteristics of the listener farmers may interact together to make a combined contribution to the perceived effectiveness of community radio. Keeping this fact in view, linear stepwise multiple regression analysis was used to explore the contribution of the selected characteristics of the listener farmers to their perceived effectiveness of Khetkhamar program of Lokobetar, as suggested by Droper and Smith (1981) to insert variables in turn until the regression equation was satisfactory. Therefore, to avoid the misleading results due to the problem of multicollinearity and to determine the best explanatory variables, the method of stepwise multiple regression was employed by involving the selected characteristics of the listener farmers as independent variables with their perceived effectiveness of community radio for disseminating agricultural information. The objective of the stepwise multiple regression models was to find out the contribution of the variables, which were significant only. Ali (2008), Moonmoon (2021), Malek (2021) and Hossain *et. al.* (2023) also followed these procedures in their studies.

After running stepwise multiple regression analysis, it was found that out of 10 independent variables, three (3) independent variables, namely time spent in farming (X_5), education (X_2), and attitude towards Khetkhamar program of Lokobetar (X_{10}) were entered into the regression equation. Results of this stepwise multiple regression analysis are shown in Table 5.

Table 5. Summary of stepwise multiple regression analysis showing the contribution of the selected characteristics of the listener farmers to their effectiveness of Khetkhamar program of Lokobetar for disseminating farm information

Variables entered	Standardized partial coefficient 'b'	Value of 't' (with probability level)	Adjusted R^2	Increase in R^2	Variation explained (%)	Collinearity Statistics	
						Tolerance	VIF
Constant	4.959						
Time spent in farming (X_5)	0.512	7.773 (0.000)	0.728	0.728	72.8	0.410	2.441
Education (X_2)	0.279	5.004 (0.000)	0.772	0.044	04.4	0.573	1.746
Attitude towards Lokobetar (X_{10})	0.248	4.496 (0.000)	0.807	0.035	03.5	0.581	1.722
		Total		0.807	80.70		
Multiple R = 0.901, R-square = 0.812, Adjusted R - square = 0.807							
F-ratio = 152.521 at 0.000 level of significance							

James *et al.*, (2013) reported that VIF of 5 or less is not problematic for collinearity in a multivariable (linear or logistic) model. In the stepwise multiple regression analysis results, it was found that Tolerance and VIF of all the significant independent variables were in the acceptable range, i.e., there was acceptable multicollinearity among the independent variables. Tolerance of the significant three (3) independent variable were >0.25 and VIF of these three variables were <4, which mean that there was no multicollinearity among these variables as suggested by Hossain, *et al.* (2023). On these considerations, the results of the full model regression analysis were accepted. Data presented in Table 5 indicated that the multiple R, R² and adjusted R² in the stepwise multiple regression analysis were 0.901, 0.812, and 0.807, respectively, and the corresponding F-ratio of 152.521 was significant at 0.001 levels. The regression equation so obtained is presented below:

$$Y = 4.959 + 0.512X_5 + 0.279X_2 + 0.248X_{10}$$

This indicated that the whole model of 10 independent variables explained 80.7 percent of the total variation in the effectiveness of Khetkhamar program of Lokobetar as perceived by the listener farmers. But since the standardized regression coefficient of three (3) variables formed the equation and were significant, it might be assumed that whatever contribution was there, it was due to these three (3) variables.

Results of stepwise multiple regression analysis again indicated that ‘time spent in farming (X₅)’ of the listener farmers was by far the most important characteristic, which strongly and positively influenced their perceived effectiveness of Khetkhamar program of Lokobetar. Farmers who spend more time in farming might have greater exposure to the radio while working in the field, especially if they use a mobile radio. They might also have stronger information needs because agricultural farming is their primary occupation and livelihood source, making them more attentive listeners. Again, farmers having more engagement in agricultural activities might have developed stronger social networks with other farmers and extension service providers, which might reinforce and complement the information received via community radio, leading to higher perceived effectiveness.

Education (X₂) and attitude towards Khetkhamar program of Lokobetar (X₁₀) of the listener farmers also had a remarkable positive influence on their perceived effectiveness of Khetkhamar program of Lokobetar for disseminating farm information. Since the remaining seven (7) variables or characteristics of the listener farmers did not enter the regression model, it was inferred that these seven (7) characteristics either had a multicollinearity problem or had a minimum contribution to the total explained variation of 80.7 percent.

Problem faced by the farmers for getting farm information through Khetkhamar program of Lokobetar:

The observed range of problems faced by the farmers for getting farm information through Khetkhamar program of Lokobetar was 6 to 23 against the possible range of 0 to 27 with the mean and standard deviation of 13.56 and 2.98, respectively. Farmers were categorized into three (3) categories based on their problem faced for getting farm information as shown in Table 6.

Table 6. Distribution of the farmers according to the problem faced by them for getting farm information through Khetkhamar program of Lokobetar

Categories	Farmers		Mean	SD
	Number	Percent		
Low (up to 9)	11	10	13.56	2.98
Medium (10-18)	89	80.9		
High (above 18)	10	9.1		
Total	110	100		

Data presented in the Table 6 indicate that an overwhelming majority (80.9%) of the respondent listener farmers faced medium problem for getting farm information as compared to 10.0% and 9.1% faced low and high problem for getting farm information, respectively.

To compare problems of nine selected items, Problem Faced Index (PFI) and Standardized Problem Faced Index (SPFI) were determined as described in methodology section. Based on descending order of SPFI, rank order was made as shown in Table 7.

Table 7. Item-wise problems of Khetkhamar program of Lokobetar for disseminating farm information with rank order

Problem Items	No. of respondents perceived					PFI	SPFI	Rank order
	High Problem	Moderate Problem	Low Problem	Not at all problem	Total			
Lack of radio for listening*	89	14	6	1	110	301	91.21	1
Weakness of network /signal	79	25	6	0	110	293	88.79	2
Limited time for broadcasting	50	47	13	0	110	257	77.88	3
Lack of feed-back facility after listening	13	37	58	2	110	171	51.82	4
Unsuitability of broadcasting time	7	32	57	14	110	142	43.03	5
Lack of usability of information	1	22	58	29	110	105	31.82	6
Lack of reliability of information	1	24	44	41	110	95	28.79	7
Inadequacy of information	2	14	52	42	110	86	26.06	8
Obscurity of voice	1	5	29	75	110	42	12.73	9

* Lack of radio for listening refers to the absence of a functional radio receiver, including reliance on shared household sets, lack of personal ownership, or radios that are out of order. Although all respondents belonged to listener clubs, this did not necessarily ensure individual or household-level radio ownership.

Based on descending order of Standardized Problem Faced Index (SPFI), “lack of radio for listening” ranked 1st followed by, “weakness of network/signal”, “limited time for broadcasting”, “lack of feed-back facility after listening”, “lack of suitability broadcasting time”, “lack of usability of information”, “lack of reliability of information”, “inadequacy of information” and “obscurity of voice”. Since lack of radio devices was the most critical constraint, Lokobetar could collaborate with NGOs and the Department of Agricultural Extension to distribute low-cost solar radios, introduce club-based ‘radio libraries’, and promote mobile streaming via FM apps for farmers without radio sets.

CONCLUSIONS

The majority (60.9%) of the respondent listener farmers perceived moderate effectiveness of Khetkhamar programs of Lokobetar and rest 39.1% of them perceived high effectiveness for disseminating farm information. Based on descending order of Standardized Effectiveness Index (SEI), ‘timeliness of information’ ranked 1st followed by ‘adequacy of information’, ‘reliability of information’ and ‘usability of information’. Stepwise multiple regression analysis showed that ‘time spent in farming’, ‘attitude towards Lokobetar’, ‘education’ of the

Lokobetar listening farmers had a positive contribution to their perceived effectiveness of Lokobetar for disseminating farm information. Based on descending order of Standardized Problem Faced Index (SPFI), “lack of radio for listening” ranked 1st followed by “weakness of network/signal”, “limited time for broadcasting”, “lack of feed-back facility after listening”, “lack of suitability of broadcasting time”, “lack of usability of information”, “lack of reliability of information”, “inadequacy of information” and “obscurity of voice”. Based on these findings, it is evident that agricultural programs containing usable, dependable, and detailed information on innovations should be broadcast at suitable times. This can be achieved by supplying radios to listeners’ clubs, strengthening signal capacity, increasing broadcasting time, and improving feedback facilities to enhance the effectiveness of Lokobetar in disseminating farm information among all categories of farmers.

RECOMMENDATIONS

Recommendations for policy implication

To systematically implement the improvement of the effectiveness of Lokobetar in disseminating farm information, a phased action plan is recommended: Phase-I (0–3 months) should begin with a rapid needs assessment to align content and broadcast timing with farmers’ information demands; Phase-II (3–6 months) should focus on improving access by distributing low-cost solar radios and establishing club-based radio libraries; Phase-III (6–9 months) should introduce a toll-free feedback line or SMS service and dedicate a short segment of each episode to listener questions to strengthen interactivity and trust; Phase-IV (9–12 months) should provide training for presenters in clear, locally appropriate communication and practical demonstration techniques; and Phase-V (12–18 months) should conduct a follow-up evaluation using the same effectiveness indicators to measure progress and guide future program improvements.

Recommendations for future study

- The sample farmers of the study were the members of listener clubs of the upazila where Lokobetar is located. Therefore, it may be recommended that further research should be conducted on the general farmers from multiple upazila at varying distances from the radio transmitter to test whether perceived effectiveness declines with distance (due to signal degradation), to identify the maximum effective broadcast radius for information dissemination, and to compare the perceived effectiveness of radio listener club members and non-member farmers.
- The study was conducted based on the perception of the listener farmers. Further research should be conducted to find out the increased level of knowledge, adoption of improved practices, cost-effective crop yield, agricultural income, etc. due to the agricultural program of Lokobetar by surveying on the same farmers before and after a defined period of program exposure.
- Listening to agricultural program from radios (national and community) was an item to measure the independent variable ‘*Mass contact* (Hours/week)’. Further research should be conducted to measure exposure to Lokobetar separately from exposure to other radio stations.

Consent

The participants consent to the publication of this article.

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Data availability statement

The datasets generated during and/or analyzed during the current study are not publicly available due to protecting the privacy of individual participants, but are available from the corresponding author on reasonable request.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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