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The effectiveness of farm programmes on Bangladesh Betar in educating farmers

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ABSTRACT

Farm programmes (FPs) of varied categories have been developed and aired over several decades by Bangladesh Betar, the national radio of Bangladesh for the diffusion of farm technologies. The study aimed to produce an in-depth academic evaluation of their effectiveness in educating farmers in Bangladesh. A sample of 465 respondents from the Khulna and Rajshahi divisions in Bangladesh was randomly selected for a questionnaire survey. To analyse the data, relevant documents were collected from the Ministry of Information, the Ministry of Agriculture, and the Ministry of Fisheries and Livestock of Bangladesh. Frequency distribution, *z*-test, and binary logistic regression analysis were used as statistical tools. The farm knowledge levels of the farmers were considered the predictors for evaluating the effectiveness of FPs. The results revealed that 93.33% of the sample did not listen to the FPs, while only very few of the listeners listened regularly. Despite this, at the 'weak' and 'average' levels of knowledge significant differences were noted between listener and non-listener farmers of FPs. The binary logistic regression analysis (Model 1) identified that the farmers who listened to the FPs were likely to acquire farm knowledge 6.62 times more than the farmers who did not listen to the FPs. The farmers who listened to the FPs were likely to have farm knowledge 2.64 times more than the farmers who did not listen to the FPs but consulted with other sources of farming information (Model 2). Similarly, a listener of FPs with farm training was likely to acquire farm knowledge 5.76 times more than a non-listener with farm training (Model 3). The FPs were found to be very effective and could be used to better complement other mechanisms for educating farmers. Regular access to the FPs ought to be ensured through appropriate stimulants for the diffusion of farm technologies.

KEYWORDS

Bangladesh Betar; farm programmes; effectiveness of farm programmes; farmers of Bangladesh; distance learning

Introduction

Radio has been the medium used most extensively in developing societies over the past several decades as a cost-effective means of providing information and education to diverse

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target groups (Mclean, 1992). Bangladesh Betar (BB), the national radio of Bangladesh, along with different government agencies, have been trying from the very beginning to educate farmers in Bangladesh about different farm technologies. Most farmers in every sector of agriculture are unaware of the existence, use and benefits of modern technologies for farming. These gaps in farming knowledge can be better addressed by radio as there is considerable support for the view that radio is an effective medium of instruction (Nwaerondu & Thomson, 1987). In many countries farm radio forums have been proven to be very successful. Farm radio forums as agents for the transmission of knowledge have proven to be a success beyond expectation (Mathur & Neurath, 1959), while according to Sitaram (1969), Ani and Baba (2009), and Ariyo et al. (2013), radio cuts across any literacy barriers.

All the ministries and departments of the Bangladesh Government have undertaken intensive efforts to inform and educate their respective farmers about modern technologies and farm techniques. In most cases, the field-level experts try to address different types of issues faced by the farmers through interpersonal communication. The collaboration between BB and other departments in the diffusion of technologies should incur beneficial results as multi-channel communication is more effective than single channel communication because when more than one channel act in concert to convey the messages about a common theme to the same audience, a kind of synergistic advantage is usually achieved (Rogers, Braun, & Vermilion, 1975). As the FPs of BB demonstrate the very qualities of a good programme needed to disseminate the correct information to the right people (Hasan, Mondal, Islam, & Hoque, 2016), the FPs of BB should be effective in educating farmers. There are some studies in Bangladesh where BB was rated based on the extent to which it was used as an information source (Bangladesh Bureau of Statistics [BBS], 2011; Kashem, Halim, & Rahman, 1992; Kashem & Poddar, 2000; Kashem & Islam, 2001) and how effectively it conveyed the information (Amin, 2010), however, there is no sound study on the effectiveness of BB in educating farmers. Therefore, this study aimed to evaluate the effectiveness of FPs of BB in educating farmers about farm technologies.

Data and methods

Sources of data

The data and necessary information were collected from both primary and secondary sources. Data were collected by means of document analysis and sample survey. As part of content analysis, programme-related official documents of the Ministry of Information, Ministry of Agriculture and Ministry of Fisheries and Livestock of the Bangladesh Government were analysed. A questionnaire survey technique was used to collect primary data.

Sampling

This study is confined to the analysis of the impact of listening to the FPs of BB on the farm knowledge of the farmers. Therefore, in selecting the study field two criteria were considered: (i) the presence of farmers cultivating staple crops of Bangladesh in that area and (ii) the coverage of both MW (Medium Wave) and FM (Frequency Modulation) transmission of Bangladesh Betar. The farmers of all eight administrative divisions are almost similar in terms of their income, size of land holdings and types of farms. So, the farmers of any division can represent the whole of Bangladesh. Nevertheless, the Varendra (ancient Gauda) area belongs

to the Rajshahi Division and a larger portion of the coastal area of Bangladesh belongs to Khulna Division. The Gauda area experiences extreme temperatures and the coastal area is a disaster prone area, therefore, both areas receive special care for the development of agriculture which resulted in some unique characteristics of the farmers of these areas. These characteristics might have shaped the radio listening habits of the farmers. Both radio stations (Bangladesh Betar, Rajshahi and Bangladesh Betar, Khulna) are established within the divisional and district towns of Rajshahi and Khulna, and both districts are within the FM and MW transmission coverage of Bangladesh Betar. That is, both areas satisfy the criteria identified above for the selection of study areas. This is why, out of eight divisions only Khulna and Rajshahi were purposively selected as the study field. The BB has twelve regional radio stations located in different parts of Bangladesh. The agricultural programmes broadcast from BB, Dhaka are relayed by the regional stations and consequently the FPs of all the regional radio stations are all the same. A few programmes are developed and broadcast by the regional stations based on the needs of the particular regions, but the formats and contents of the programmes which are prescribed and approved by the head office (BB, Dhaka) are almost the same for all the stations. So, a single regional station can represent the whole of BB. This study purposively selected BB, Khulna; and BB, Rajshahi. The BB, Khulna is one of the biggest radio stations covering the entire south-west of Bangladesh and the BB, Rajshahi is also one of the biggest radio stations covering almost all of the northern part of Bangladesh. There are eighteen Upazillas (sub-districts) in Khulna and Rajshahi districts (nine for each). A multistage stratified sampling technique was used. At the 1st stage, eight Upazillas were selected out of eighteen (four from each district) of the Khulna and Rajshahi districts. At the 2nd stage, eight Unions (the smallest local government unit) were selected from eight Upazillas (one from each Upazilla) and at the 3rd stage, sixteen villages (two from each union) were selected. At the 4th stage, the farmers (respondents) were selected by means of a random sampling technique from each village (Figure 1). The total sample size was determined using the following formula:

$$n = \frac{Z^2 pq}{\varepsilon^2}; \text{assuming that } p = 0.5 \text{ and } q = 0.5.$$

Here, n = sample size, Z = tabulated value = 1.96 (for large sample at 5% level of significance), p = proportion of success, $q = 1 - p$ = proportion of failure, ε = margin of error = 0.05.

Based on this formula, 384 respondents were supposed to be selected from the two districts. However, in order to improve the research, 465 respondents were selected from the two study areas; the area and sector-wise sampling is presented in Table 1.

Data collection

A sample of 465 farmers was surveyed from June to September 2014 to collect primary data pertinent to the study objective. A content analysis technique was followed to collect secondary data from the documents of BB and other relevant organisations viz. Ministry of Agriculture and, Ministry of Fisheries and Livestock.

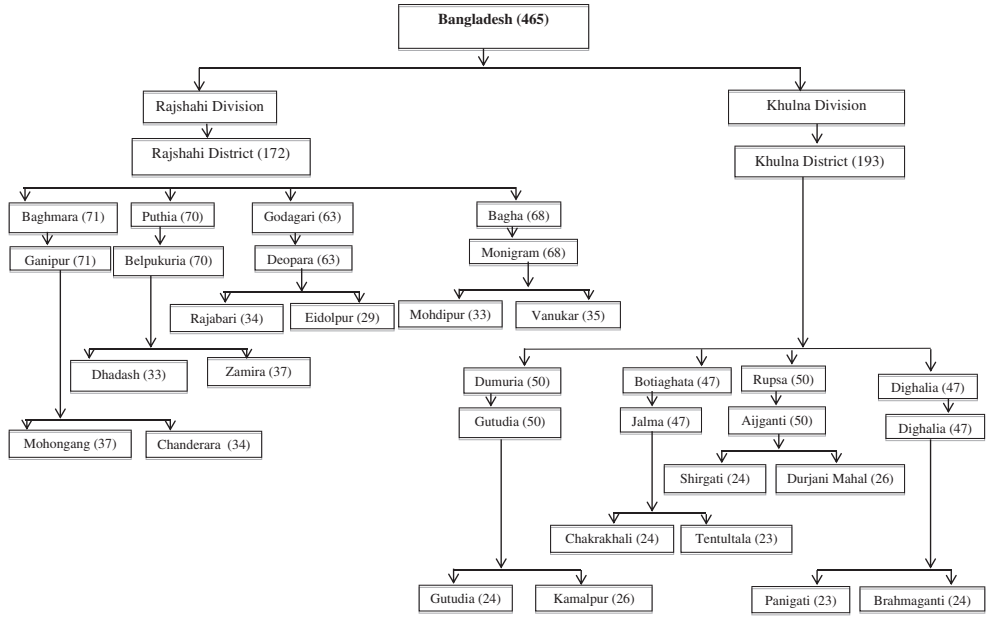

Figure 1. Sampling flowchart.
Note: The number inside the parenthesis indicates the number of respondents.

Table 1. Area and sector-wise sample size of the farmers ($N = 465$).

					Agricultural sectors			
Division	District	Upazilas	Unions	Villages	Crop	Livestock	Fisheries	Total
Rajshahi	Rajshahi	Baghmara	Ganipur	Mohongang	24	7	6	37
				Chanderara	25	4	5	34
		Puthia	Belpukuria	Dhadash	21	6	6	33
				Zamira	26	6	5	37
		Godagari	Deopara	Rajabari	24	4	6	34
				Eidolpur	20	4	5	29
		Bagha	Monigram	Mohdipur	26	5	2	33
				Vanukar	25	6	4	35
Total sample (n_1) from Rajshahi					191	42	39	272
Khulna	Khulna	Dumuria	Gutudia	Gutudia	10	4	10	24
				Kamalpur	11	5	10	26
		Botiaghata	Jalma	Chakrakhali	10	4	10	24
				Tentultala	10	3	10	23
		Rupsa	Aijganti	Shirgati	10	5	9	24
				DurjaniMahal	10	4	11	26
		Dighalia	Dighalia	Panigati	10	4	9	23
				Brahmaganti	10	4	10	24
Total sample (n_2) from Khulna					81	33	79	193
Total sample (N) from Rajshahi and Khulna					172	75	118	$N = 465$

Data analysis

Frequency distribution, *z*-test and binary logistic regression analysis were used to analyse the data. To test the farm knowledge levels of the farmers, ten questions from each of the sectors were selected and each and every respondent was questioned on the basis of these ten questions of the respective field. All the questions were of equal value. Each right answer

was coded '1' while any other answers were coded '0'. The marks obtained by the farmers with reference to their responses to the questions asked during the survey and the levels of knowledge were measured on a five-point Likert scale which then was converted into three-point Likert scale (Table 2) for measuring the significance of the differences between the listeners and non-listeners of the FPs of BB in three groups. For the first comparison, the total sample ($N = 465$) was considered as group S where 31 respondents listened to the FPs (coded 1) and the rest 434 respondents did not listen to the FPs (coded 0). Another two sub-groups (s_1 *and* s_2) of group S were considered for further comparison between the knowledge levels. In sub-group s_1 ($N_1 = 115$), 31 respondents listened to the FPs (coded 1) and the rest 84 respondents did not listen to the FPs (coded 0), but they consulted with other sources [(fellow farmers; salesmen of fertiliser, seeds, pesticides and medicine (individual salesmen, company agents/dealers, company doctors/consultants/leaflets and so on); agricultural departments (Agriculture Officers, Veterinary Surgeons and Fisheries Officers); FPs on television (TV); and FPs on BB)] of farm information. In sub-group s_2 ($N_2 = 123$), 14 respondents with farm training listened to the FPs (coded 1) and the rest 109 respondents with farm training did not listen to the FPs (coded 0). Lastly, the knowledge levels were converted into two-point (High, coded 1; and Low, coded 0) Likert scale (Table 2) for binary logistic regression to measure the degree of effects of FPs on the farmers' knowledge. In the binary logistic regression model, knowledge level (Y) was treated as the dependent variable. The dependent variables (Y_i, $i = 1$ (group S), 2 (sub-groups s_1), 3 (sub-group s_2) were classified in the following manner:

$$Y_i = \begin{cases} 0, \text{ low}, \\ 1, \text{ high}, \end{cases} \qquad \text{where } i = 1, 2, 3.$$

Statistical Package for Social Sciences software version 17.0 (SPSS Inc., Chicago, IL, USA) and STATISTICA 8 were used for data analysis.

Results

This study revealed that farmers in Bangladesh are generally used to take suggestions from five sources, namely fellow farmers; salesmen of fertiliser, seeds, pesticides and medicine (individual salesman, company agents/dealers, company doctors/consultants/leaflets and so on); agricultural departments (agriculture officers, veterinary surgeons and fisheries officers); FPs on TV; and FPs on BB. Out of 465 respondents only 31 farmers used to listen to the FPs on BB. The knowledge levels of these 31 farmers were compared in three steps. The knowledge levels of all the respondents are listed in Table 2.

Table 2. Distribution of knowledge amongst the respondents using Likert scale.

Secured numbers (%)		Level of knowledge	
0–20	Very poor (272, 58.50%)	Weak (403, 86.67%)	Low (403, 86.67%)
21–40	Poor (131, 28.17%)		
41–60	Average (51, 10.97%)	Average (51, 10.97%)	High (62, 13.33%)
61–79	Good (9, 1.93%)	Strong (11, 2.36%)	
≥80	Very good (2, 0.43%)		
Total (*N*, %) (465, 100.00)			

Note: The numbers in the parentheses indicate the number of respondents and their percentage, respectively.

Table 3. Comparison between listeners and non-listeners of farm programmes (FPs) on Bangladesh Betar.

Steps	Groups	Knowledge levels			Total
		Weak (%)	Average (%)	Strong (%)	
Group *S*	Non-listeners of FPs	386 (88.94)	40 (9.22)	8 (1.48)	434
	Listeners	17 (54.84)	11 (35.48)	3 (9.68)	31
	Total (*N*)	403 (86.67)	51(10.97)	11(2.36)	465
	p-values	0.00	0.00	0.005	
Sub-group s_1	Non-listeners of FPs but they consulted other sources[a] of farm information	64 (76.19)	16 (19.05)	4 (4.76)	84
	Listeners	17 (54.84)	11(35.48)	3 (9.68)	31
	Total (N_1)	81 (70.43)	27 (23.48)	7 (6.09)	115
	p-values	0.026	0.064	0.327	
Sub-group s_2	Non-listeners of FPs having farm training	75 (68.81)	27 (24.77)	7 (6.42)	109
	Listeners having farm training	4 (28.57)	8 (57.14)	2 (14.29)	14
	Total (N_2)	79 (64.23)	35 (28.46)	9 (7.31)	123
	p-values	0.003	0.012	0.289	

[a]Fellow farmers, salesmen, government agencies (Agriculture Officers, Fisheries Officers, Veterinary Surgeons), farm programmes on television.

In comparing the listeners and non-listeners (Group *S*) it was seen that almost all (88.94%) the non-listeners of FPs had weak farm knowledge while half of the listeners (54.84%) of FPs also had weak farm knowledge (Table 3). In measuring average knowledge, the listener group displayed four times more knowledge than of the non-listener group. When assessing for a strong level of knowledge, the percentage of listeners was almost seven times higher than the non-listener group (Table 3). In the proportion test (*z*-test) at every level of farm knowledge the difference was found highly significant ($p < 0.00$) (Table 3). In the logistic regression model it was seen that if a farmer listened to the FPs, he/she was likely to acquire farm knowledge 6.62 times (OR: 6.623; 95% CI: 3.071–14.279) more than the farmers who did not listen to the FPs (Table 4).

The comparison between the listeners of FPs and farmers who did not listen to the FPs but consulted with the other four sources (Agricultural Departments**,** TV, Salesmen and Fellow Farmers) of farm information (Sub-group s_1), showed that most of the farmers (76.19%) who did not listen to the FPs had weak farm knowledge, a few of them (19.05%) had an average level of knowledge and a very negligible portion (4.76%) of them had a strong level of knowledge (Table 3). In comparison (*z*-test) with those of the listener group, it was seen that at the weak and average knowledge levels the differences were significant (Table 3). In the logistic regression model it was seen that if a farmer listened to the FPs on BB along with consulting with other sources of farm information, he/she was likely to acquire farm knowledge 2.64 times (OR: 2.635; 95% CI: 1.107–6.274) more than the farmers who did not listen to the FPs (Table 4).

Comparing between trained farmers (having farm training) who listened to the FPs and trained farmers who did not listen to the FPs (Sub-group s_2) showed that most of the trained non-listeners (68.81%) and one-fourth of the trained listeners (28.57%) had weak farm knowledge whereas more than half of the trained listeners (57.14%) and one-fourth of the trained non-listeners (24.77%) had average farm knowledge and a very few of the farmers of both groups (listeners and non-listeners) had strong farm knowledge (Table 3). The comparison between the proportions (*z*-test) demonstrated that at weak and average knowledge levels

Table 4. Effects of farm programmes (FPs) on Bangladesh Betar on the farming knowledge of farmers.

Characteristic		Coefficient (β)	SE (β)	p- values	Odds ratio (OR)	95% CI for OR	
						Lower	Upper
Model 1	*Listening to FP*						
	Do not listen (*R*)				1.00		
	Listen	1.890	0.392	0.000	6.623	3.071	14.279
Model 2	*Listening to FP*						
	Do not listen but consulted with other sources[a] (*R*)				1.00		
	Listen	0.969	0.443	0.029	2.635	1.107	6.274
Model 3	*Listening to FP*						
	Do not listen but have farm training (*R*)				1.00		
	Listen and have farm training	1.751	0.627	0.005	5.758	1.684	19.686

Note: '*R*, the reference category', 'CI, the confidence interval'.
[a]Fellow farmers, salesman, government agencies (agriculture officers, fisheries officers, veterinary surgeons), farm programmes on television.

the differences were significant ($p < 0.05$) between trained listeners and trained non-listeners (Table 3). The regression model showed that if a farmer who had farm training listened to the FPs on BB, he/she was likely to acquire farm knowledge 5.76 times (OR: 5.758; 95% CI: 1.684–19.686) more than farmers who had farm training but did not listen to the FPs on BB (Table 4).

Discussion

The objective of the study was to reveal the effectiveness of BB in educating farmers. It was found that a small number of farmers listened and very few of them listened regularly or at least, to all the farm programmes on BB. Even so, at every level of agricultural knowledge the farmers who listened to the FPs on BB were better than the farmers who did not listen to the FPs. Even the trained farmers who listened to the FPs were better than those trained farmers who did not listen to the FPs. This suggests that the FPs on BB were effective in educating farmers and these results resembled those of studies conducted elsewhere (Ango, Illo, Yakubu, Yelwa, & Aliyu, 2013; Kumari, Choudhary, Jha, & Singh, 2014; Nazari & Hasbullah, 2010; Nwaerondu & Thomson, 1987; Okwu, Kaku, & Aba, 2007). This result might be explained by the fact that the FPs had the ability to educate the farmers and those who listened to the FPs became conscious of the importance of farm knowledge and farm technologies more than those who did not listen. The cognisance of farm technologies and their importance led them to make greater effort to seek more information concerning farm activities which resulted in relatively greater competence than the non-listeners of FPs. It was also observed that amongst the three levels of knowledge, at the first two levels (weak and average) the differences amongst listeners and non-listeners were found to be significant, but at the third level (strong), the difference between listeners and non-listeners was not significant. The reason for this might be that, amongst the listeners, almost all the respondents did not listen to the FPs regularly and even they did not listen to all the farm programmes broadcast daily from a single radio station. The FPs of BB were designed in such a way so that almost all the subjects and topics related to the crops cultivated, and fish and livestock reared in Bangladesh

were incorporated (Hasan, Mondal, Islam, & Hoque, 2017). Therefore, it is assumed that if the listeners listened to all the programmes regularly, then they would become more knowledgeable about farm technologies.

The limitation of the study was that the forest sector was excluded from this study because of time and economic constraints and the study was confined to Rajshahi and Khulna regions. The result may vary beyond the study areas and the methodology followed here. Further studies may be conducted on finding out the causes behind the low listenership of the FPs of BB; strategies to motivate the farmers to listen to the farm programmes; finding out which device is culturally fit to convey the FPs to the farmers for accelerating the extension services; the effectiveness of BB in motivating the listeners to adopt new technologies for farming and so on.

Conclusion

The study intended to evaluate the performance of the FPs of BB in disseminating the information about farm technologies to farmers and thereby meeting their farming educational needs. Having completed the above analysis and following the discussion of the results, it could be concluded that the FPs of BB were very much effective in educating farmers about the modern farming technologies. The FPs were designed in collaboration with the experts of all agricultural departments of the government of Bangladesh in such a way that when a farmer regularly listens to all the FPs broadcast daily from a single radio station and to their full extent, he/she will be equipped with all his/her required farming information. However, the study revealed that most of the farmers did not listen to the FPs of BB. Even, those who listened to the FPs did not listen to the programmes regularly. Even so, the impact of listening to the FPs was quite apparent. There was a clear difference between the listener and non-listener groups of the FPs. At almost every level of agricultural knowledge the listeners of the FPs were at a better position than the non-listeners of the FPs of BB. It was also demonstrated that the FPs could better complement other mechanisms for educating farmers about farm technologies. So, all the farmers should listen to the FPs of BB and the authorities concerned should adopt the necessary means to encourage the farmers to listen to the FPs regularly so that they can become aware of modern farm technologies and the benefits of using these technologies. For that reason interdepartmental collaboration should be enhanced.

Ethical considerations

Ethical issues (including plagiarism, informed consent, misconduct,data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Disclosure statement

The authors declare that they have no competing interest.

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