

FARMERS' ATTITUDES TOWARDS RICE PRODUCTION IN SELECTED AREAS OF MYMENSINGH DISTRICT

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ABSTRACT

The study attempted to examine farmers' attitudes towards rice production and also to identify factors influencing the attitudes. A total of 100 rice producers were selected purposively from four unions of Phulpur Upazila under Mymensingh district. Data were collected from mid-September to mid-October 2017 through face to face interview method. Five point Likert scale was used to examine farmers' attitudes towards rice production. A multiple regression model was used to examine whether there are influencing factors (socio-economic characteristics) on the farmers' attitudes towards rice production. By using the Likert scale, total score value for individual farmers was calculated and it was found that most of the farmers' (98 percent) attitudes towards rice production were favored; and only 2 percent were un-favored attitudes towards rice production in the study area. Average score value for the individual statements were also estimated and found that score value was less than three for only three statements out of 20 statements, it also proved that most of the cases (85 per cent) farmer's attitudes were favored towards rice production. The study found that level of education, occupation and farm size had significant influences on the farmers' attitudes towards rice production.

Key words: Farmers' attitudes; rice production; Mymensingh district; likert scale

I. INTRODUCTION

Rice price plays an important role in the economy of Bangladesh. So fluctuation in rice prices has a great economic impact on the people of Bangladesh. Furthermore, price instability leads to uncertainty in the income of the producers. This uncertainty retards investment in agriculture resulting in slow growth of agricultural output (MoF, 2016). With a large proportion (23.2%) of the population living in poverty (BBS, 2016), increases in the price of staple foods can have a large impact on food security, particularly for rural populations. The disequilibrium of demand and supply in agriculture is a universal phenomenon. The nature of the supply, demand and output conditions in agriculture is such that it creates inherent instability. In the absence of any major shortfalls in the domestic availability of food grains, the rising price trends could be attributed to rising international prices. In fact, food price increases in international markets are transmitted quickly to Bangladesh.

The economy of Bangladesh is primarily depended on agriculture, which contributes to about 15.35% to the gross domestic product (GDP) (BBS, 2016). As a staple food, per capita, rice consumption is about 367 gm/day (BBS, 2016) and it is the fourth largest rice consumer in the world (STATISTA, 2017). Bangladesh turns the world's fourth largest rice producer after China, India, and Indonesia (USDA, 2017). It alone provides 76% of calorie intake and 66% of total protein requirement of daily food intake (BBS, 2016). The increasing rate of rice production has lessened slightly over the past few years compared to the rate of population increase. To meet the additional needs, the country needs to import rice every year. Around 15 lakh tonnes of coarse rice was imported in the 2014-15 fiscal year through the private sector (MoF, 2016).

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Rice is the staple food for about 160 million people in Bangladesh. It is the dominant staple food in the country, accounting for about 35 percent of household expenditure. About 75 percent of the agricultural production originates in the crop sector alone in Bangladesh of which rice contributes about 80 percent (BBS, 2015).

Bangladesh has a long history of rice cultivation. Rice is grown throughout the country except in the southeastern hilly areas. The agro-climatic conditions of the country are suitable for growing rice year-round. However, the national average rice yield is much lower (2.94 ton/ha) than that of other rice growing countries. The distribution of land for rice production stands for 74.85% which represents a lion share of land used for rice cultivation in Bangladesh (BBS, 2017).

Many farmers switched from producing summer rice to jute, maize and vegetable cultivation due to higher returns. Bangladesh's notification for mandatory use of bulk burlap bags for five agricultural commodities is driving demand for jute and farmers have responded by increasing jute cultivation, which is expected to be more profitable than summer rice. However, winter rice production was forecast marginally higher and was revised up to 18.8 million tons (World-Grain, 2016).

Given the volatility of the prices of rice during the past few years of Bangladesh and on international markets and the negative impacts on both the poor farmers and consumers, there has been much concern over the efficient functioning of the marketing system. The key structural aspects of the rice market involve the number and concentration of the agents, the ease of entry into the business and the functions performed by relatively small establishments at various levels of marketing chain (Chowdhury, 1992 as cited in Raha *et al.*, 2013).

A few studies (Bari, 2001; Ashaduzzaman 2003; Samad, 2010; Shah *et al.*, 2015; Hasan *et al.*, 2015; Abdullah *et al.*, 2015; Rahman, 2015; Rahman, 2015; Chouichomet *et al.*, 20016) conducted which are related with this study. These studies were conducted to measure farmers' attitudes mainly for specific variety of rice, specific season of rice, agrochemicals in rice production, risk in paddy production, and organic rice farming. But this study is little bit different; this study has considered rice as a whole for measuring farmers' attitudes on it. Today, attitude occupies a central role in the theories and research regarding consumer behavior (Ajzen, 2008). As some researchers would put it - it is not only important, it is essential (Faris, 1928). In fact, the term 'attitude' was introduced in social psychology as an explanatory device in an attempt to understand human behavior (Fishbein & Ajzen, 1980). A fairly easy to understand definition is that attitudes represent what one likes and dislikes (Blackwell *et. al.*, 2001), or the amount of positive and negative feelings one has towards an object (Schlenker, 1978). A consistent number of authors (Schlenker, 1978; Fishbein & Ajzen, 1980; Insko & Schopler, 1967; Peabody, 1967) expand and define attitudes as learned tendencies when responding to an object in a consistently favorable or unfavorable manner.

Sometimes, it is observed in print and electronic media that farmers are very loser for producing rice; they are not getting enough prices to cover its cost of production. They put their hands on forehead. They express their sorrowfulness. As rice producers are not happy to produce rice. Because they are not getting reasonable price of that; but still they are producing rice. So, question is, if it is not profitable, why are they producing it? What they are thinking about this? What is their attitude on rice production now and in future? In some areas, farmers are switching to other crops which are more profitable. In this perspective, an attempt has been taken to examine the farmers' attitudes towards rice production and also examined which factors have influenced the farmers' attitudes.

II. METHODOLOGY

The study was conducted in selected areas of the Mymensingh district. Mymensingh was the largest amount of rice producing district in Bangladesh. It produced 5.12 percent of the total amount of rice (BBS, 2017). Four unions (Poyari, Rahimgonj, Tarakanda, and Rupashi) of Phulpurupazila under Mymensingh district were selected purposively for the study. The study was based on primary data which were collected during the period from mid-September to mid-October, 2017. Data were collected from 100 selected farmers' through personal interview method. The farmers were categorized into three groups; small (farm size up to 2.49 acre), medium (farm size 2.50 acre to 7.49 acres), and large (farm size above 7.49 acres) and the categories had 45, 40 and 15 farmers respectively and they were selected by using purposive sampling technique. All data were carefully checked for completeness and summarization. Descriptive type statistics (mean, standard deviation, and percentage) frequency tables, ranking, graphical analysis, etc. were used to examine the different attributes.

Likert scale was used to measure farmers' attitudes on rice production. To apply the Likert scale a series of items were compiled that expressed a wide range of attitudes, from extremely positive to extremely negative. Each item calls for checking one of five fixed alternative expressions such as "strongly agree", "agree", "neutral", "disagree", and "strongly disagree". In this five point continuum, weights of 5,4,3,2,1 and 1,2,3,4,5 are assigned in case of positive and negative statements respectively. After that, a total score for each farmer is calculated by summing the value of each item that checked. Then the researchers determined a basis for the selection of items for the final scale. This can be done with item analysis. With item analysis, each item is subjected to a measurement of its ability to separate the highs from the lows. This is called the discriminative power (DP) of the item (Nachmias and Nachmias, 1992).

$$DP = Q_1 - Q_2$$

Where,

Q_1 = range above the upper quartile

Q_2 = range below the lower quartile

The DP value was computed for each of the scale items and those with the largest DP values are the items that best determinate among individuals expressing deferring attitudes toward the measured attitudes. In calculating the DP, at first, we determined the total score value of all scale items for each farmer and placed the scores in an array, usually from lowest to highest. Next, we compared the range above the upper quartile (Q_1) with that below the lower quartile (Q_2), and the DP value was calculated as the difference between the weighted means of the scores above Q_1 and of those that fall below Q_2 (Nachmias and Nachmias, 1992). A total of 100 farmers' expression was checked for 23 scale items. And three scale items were excluded from the items based on Discriminative Power (DP) which were the smallest values. Then finally the 20 scale items were used for the analysis.

Here (Table 1) 23 statements (scale items) were included in the interview schedule to check the response from rice producing farmers for measuring attitudes.

Table 1: Statements for measuring farmers' attitudes towards rice production

Sl. No.	Statements
1.	Rice is my staple food, so I produce rice.
2.	Rice is less profitable than other crops.
3.	Rice production is not profitable.
4.	Though rice production is not profitable, I want to continue it.
5.	I am efficient in producing rice. So, I want to produce it.
6.	Rice production is less risky than other crops.
7.	My land is more suitable for rice production. So, I like to produce rice.
8.	Production cost of rice is less than other high value crops. So, I produce rice.
9.	My parents, grandparents used to cultivate rice, so I am doing this (producing rice)
10.	We don't get better price of rice.
11.	If government withdraws subsidy from fertilizer and fuel, I will produce rice.
12.	I want to increase my rice cultivation next year.
13.	I want to cultivate rice in same amount of land in the next year.
14.	Whatever the rice market prevails, I will continue my rice cultivation.
15.	I am satisfied with the production of rice.
16.	We need more HYV rice.
17.	I am satisfied with my rice farming.
18.	Government's rice procurement is helping rice producers.
19.	Price of rice becomes very low at harvesting period, so I will not continue it in future.
20.	In future, rice production will be more profitable.
21.	Government is giving enough support to produce rice.
22.	Though the cost of paddy cultivation has been increased, I will continue it.
23.	If I purchase rice (milled rice) from the market then it will cost me higher than if I produce rice. So, I will continue to produce rice.

Table 1 show the total items which were used in five point Likert scale. The response of the respondent (farmer) which was divided into strongly agree, agree, neutral, disagree, and strongly disagree. The weights for favorable items were assigned as follows: Strongly agree 5; Agree 4; Neutral 3; Disagree 2; strongly disagree 1. On the other hand for unfavorable items, the weight would have been reversed (strongly agree 1; agree 2; neutral 3; disagree 4; and strongly disagree 5). Item 2, 3, 10 and, 19 are unfavorable items for the context of rice production and the rest of them (19 items) are favorable items.

Table 2: Calculating DP value for the first scale item (statement) "Rice is my staple food, so I produce rice"

Group	Number in a group	Score					Weighted total	Weighted mean	DP (Q ₁ -Q ₂)
		5	4	3	2	1			
High 25% (Q ₁)	25	22	3	0	0	0	122	4.88	0.40
Low 25% (Q ₂)	25	12	13	0	0	0	112	4.48	

- ❖ Weighted total = Summation (Score × Number who checked that score)
- ❖ Weighted mean = weighted total/number in group
- ❖ DP = difference between the weighted mean of Q₁ and Q₂

From the table, it is seen that the weighted total and weighted mean for the high (25%) were 122 and 4.88 respectively. For low (25%) weighted total and weighted mean were 112 and 4.48 respectively. After calculation, it was depicted that the DP value was 0.40. In this way, DP values

for the rest of the 22 statements were calculated. Statements were arranged according to the descending order of DP values in Table 3.

Table 3: Descending order of DP values with their corresponding statements

Sl. No.	Scale items (statements)	DP Value
1	I am satisfied with the production of rice.	1.88
2	Rice is less profitable than other crops.	1.84
3	I am satisfied with my rice farming.	1.52
4	Rice production is not profitable.	0.88
5	My parents, grandparents used to cultivate rice, so I am producing rice.	0.88
6	In future, rice production will be more profitable.	0.68
7	I am efficient in producing rice. So, I want to produce it.	0.64
8	Production cost of rice is less than other high value crops. So, I produce rice.	0.64
9	I want to cultivate rice in same amount of land in the next year.	0.52
10	Rice is my staple food, so I produce rice.	0.40
11	If government withdraws subsidy from fertilizer and fuel, I will produce rice.	0.40
12	Cost of paddy cultivation has been increased tremendously.	0.40
13	Though rice production is not profitable, I want to continue it.	0.36
14	Rice production is less risky than other crops.	0.36
15	My land is more suitable for rice production. So, I like to produce rice.	0.32
16	If I purchase rice (milled rice) from the market then it will cost me higher than if I produce rice. So, I will continue to produce rice.	0.24
17	Whatever the rice market prevails, I will continue my rice cultivation.	0.20
18	We need more HYV rice.	0.20
19	I want to increase my rice cultivation next year.	0.16
20	Government's rice procurement is helping rice producers.	0.16
21	We don't get better price of rice.	0.04
22	Price of rice becomes very low at harvesting period, so I will not continue it in future.	0.00
23	Government is giving enough support to produce rice.	0.00

The DP value was computed for each of the 23 scale items, and those items with the largest DP values were selected. These are the items that best discriminate among individuals expressing different attitudes toward the measured attitudes. All the DP values are shown in Table 3 where the statements are arranged in descending order of DP values. From the above twenty-three statements; last three statements from Table 3 was excluded as it kept the DP value lowest and finally 20 statements were used to analyze the farmers' attitudes towards rice production.

To explore the relationship between the selected characteristics of the farmers and their attitude (total score value of 20 scale items for individual farmers) towards rice cultivation, the regression coefficient was computed. The following multiple linear regression model was used to identify the factors influencing farmers' attitudes towards rice production.

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + U_i \dots \dots \dots (1)$$

Where,

Y_i = Farmers' attitudes (score value) towards rice production

X_1 = Age of household head (years)

X_2 = Family size (no.)

X_3 = Educational level of household head (years of schooling)

X_4 = Occupation of the household head (1 if main occupation is farming; 0 otherwise)

X_5 = Farm size (acres)

X_6 = Farming experience (years of farming)

$\beta_1, \beta_2, \dots, \beta_6$ = regression coefficient

β_0 = intercept

U_i = regression error

III. RESULT AND DISCUSSION

Farmers' Attitudes towards Rice Production

Attitudes may be defined as the predisposition or a tendency to respond positively or negatively towards a certain idea, object, person or situation. Attitude influences an individual's choice of action, and responses to challenges, incentives, and rewards (together called stimuli) (Business dictionary 2017). People are different in terms of sex, culture, religion, occupation, age, education, income, personality, etc. A person's perception of any item or idea is influenced by all the above factors and definitely, all these factors are mutually exclusive. The psychological factor is one of the most important matters of fact that affect farmers' attitudes towards rice production.

Favorableness and Un-favorableness of Farmers towards Rice Production

From the calculation of the total score value of individual farmers, favorableness and un-favorableness on rice production are presented in Table 4. The farmers were categorized into three types; i) favored toward rice production (range score value: 61 – 100), ii) neutral toward rice production (range score value: 60), iii) Un-favored towards rice production (range score value: 20-59) (see Kothari, 1990). Here, the highest value of individual score can be 100 and the lowest can be 20 because the total number of item 20.

Table 4: Percentage of favorableness and un-favorableness toward rice cultivation of farmers on the basis of individual score value

Score value	Particulars	Percentage of responses
61-100	Favored towards rice production	98
60	Neutral attitudes on rice production	0
20-59	Un-favored towards rice production	2
	Total	100

Table 4 presents that 2 percent of respondents were in disfavored attitudes towards rice production. There were no respondents representing neutral attitude towards rice production. The percentage of favored rice producers was extremely high (98 percent). This is a good sign that the rice producers will continue their rice production while considering the present situation of rice farming in the study areas.

Average Score Value on Individual Statements towards Rice Production

The average score value for every 20 items was calculated to observe the extent of attitudes on individual items and also to compare among them. From this result, there will be a scope for the policymaker to take initiatives on specific items to improve the situation. Here the weighted average has been used to measure the attitudes on individual scale items. The maximum weighted average will be 5.00 and the minimum will be 1.00.

Table 5: Attitudes of farmers towards rice production on individual scale items in descending order

Serial number	Scale items (statements)	Average score value
1	We need more HYV rice.	4.90
2	Rice is my staple food, so I produce rice.	4.62
3	If government withdraws subsidy from fertilizer and fuel, I will produce rice.	4.51
4	Though cost of paddy cultivation has been increased, I will continue it	4.50
5	My land is more suitable for rice production. So, I like to produce rice.	4.36
6	I am efficient in producing rice. So, I want to produce it.	4.33
7	Rice production is less risky than other crops.	4.29
8	If I purchase rice (milled rice) from the market then it will cost me higher than if I produce rice. So, I will continue to produce rice.	4.28
9	My parents, grandparents used to cultivate rice, so I am doing producing rice.	4.26
10	Production cost of rice is less than other high value crops. So, I produce rice.	4.11
11	Whatever the rice market prevails, I will continue my rice cultivation.	4.03
12	Though rice production is not profitable, I want to continue it.	3.87
13	I want to increase my rice cultivation next year.	3.80
14	Rice production is not profitable.	3.78
15	In future, rice production will be more profitable.	3.77
16	I am satisfied with my rice farming.	3.64
17	I am satisfied with the production (yield) of rice.	3.55
18	Rice is less profitable than other crops.	2.99
19	I want to cultivate rice in same amount of land in the next year.	2.71
20	Government's rice procurement is helping rice producers.	1.54

Table 5 shows the attitudes of farmers on individual statements with weighted average score value towards rice production. Here the range of the weighted average score value is from 1 to 5 (since it is five point scales). The higher weighted average value favors any statement and a lower weighted score value depicts low favor to any statement. It is seen that most of the individual statements have weighted score values higher than three that means most of the cases farmers had shown their favorable attitudes towards rice production in the study area. HYV rice is essential to encourage more farmers to produce rice (weighted average score value is 4.90). The government should take steps to supply as much as HYV rice seed to the farmers as they show high favor for the statement. Most of the farmers produce rice because rice is the staple food for them and this

statement carries 4.62 weighted average values. Most of the farmers disfavor the statement that the government's rice procurement is helping rice producers (weighted average score value is 1.54). So the government should be more conscious during the rice procurement system and other support services to the rice producers. It can be concluded from this section that the overall attitudes of the farmers towards rice production were favorable.

Empirical Results of Factors Influencing Farmers' Attitudes towards Rice Production

A multiple regression analysis was done in this regard. It was checked if there were exist any multicollinearity among the independent variables. Multicollinearity is the existence of a perfect, or exact, linear relationship among some or all explanatory variables of a regression model (Gujarati, 1998). At first, seven independent variables (age, family size, education, occupation, farm size, annual income, and farming experience) were included in the model but it was found that there was a high correlation coefficient (more than 0.738) between farm size and income. For that reason, annual income was excluded from the model and finally, six independent variables were included in the model. Correlation coefficients among the six independent variables are shown in Table 6. Variance Inflating Factor (VIF) was also applied to check the multicollinearity between the independent variables. The results of the VIF as shown in Table 7 revealed that the VIF value of the variables is less than 10. According to Gujarati (1995), if VIF exceeds 10, the concerned variable is said to be highly correlated. So, there was no problem with multicollinearity problem found in this model. There were three variables (education, occupation, farm size) out of six independent variables in the model found significant in explaining the variation of farmers' attitudes towards rice production. That means there were significant influences of these variables on the attitudes of farmers towards rice production in the study areas.

Table 6: Correlation coefficient between the independent variables

Criteria	Age	Family size	Education	Occupation	Farm size	Experience
Age	1.00					
Family size	0.252	1.00				
Education	-0.006	-0.103	1.00			
Occupation	-0.021	0.161	-0.376	1.00		
Farm size	0.294	0.057	0.253	-0.278	1.00	
Experience	0.608	0.270	-0.027	0.154	0.258	1.00

Table 7: Estimates of multiple regression of factors influencing farmers' attitudes towards rice production

Model	Coefficients	Standard error	t-value	Significance level	VIF
(Constant)	76.30	2.763	27.614	0.000	3.108 1.109 1.211 1.306 1.250 3.197
Age	0.010	0.063	0.159	0.874	
Family size	0.044	0.320	0.136	0.892	
Education	0.569	0.108	5.256	0.000	
occupation	3.024	1.233	2.452	0.016	
Farm size	-0.588	0.183	-3.217	0.002	
Experience	0.047	0.071	0.655	0.514	
R ²	28.4%				
Adjusted R ²	23.8%				

Dependent Variable: score value (attitudes of the farmers)

The results revealed that the level of education of the farmers had a significant positive coefficient value which was 0.569 with their attitude towards rice cultivation and the coefficient is statistically significant. Regression coefficient indicates that if the level of education increases 1 unit (one year of schooling) then farmers' attitudes towards rice production increases 0.569 unit. That means educated farmers have more favorableness towards rice cultivation. Educated farmers might have more access to new technology and information (regarding production practices, product price)., They also can have more social capital and can use the inputs more judiciously, as a result, they can be more benefited from rice production than less educated farmers.

Occupation of the household head had positive significant effect (3.024) on attitudes towards rice cultivation. Implies that household head whose main occupation was farm related had more favorableness towards rice cultivation rather than others. The farm size of the respondents showed a significant negative relationship with their attitude towards rice cultivation. And the coefficient value was 0.588. It revealed that small farm holders had more favorable attitude towards rice cultivation than the large farm holders. Pandit (2007) reported that the small farm holders had a tendency to use traditional and proven technology to their farms because they usually do not like to take any risk of new technology. But the large farm holders had a tendency to do something new and they had also the capability to take risk of new technology. So, it can be concluded that small farmers had positive attitudes towards rice production but not the large farmer.

IV. CONCLUSION

The findings of the study revealed that most of the farmers' (98 per cent) attitudes towards rice production were favorable in the selected study area. So, when we see news in print and electronic media that farmers are very much dissatisfied with their rice production, this type of news may not be treated for the country as a whole. Weighted average score values for the individual statements were less than three for only three statements and greater than three for 17 statements out of 20 statements, which indicated that in most of the cases (85 per cent) farmers' attitudes were favorable towards rice production. The study also found that farm size had negative influence on farmers' attitudes. It revealed that small farm holders had more favorable condition towards rice cultivation than the large farm holders and it is a positive sign for rice cultivation as most of the farmers in Bangladesh are of small farm holders. The household head whose main occupation was farming had positive attitudes towards rice production rather than other. The study also implied that government's rice procurement system was not helping rice producers properly as it carried the lowest average score value. So the government should be more conscious during the rice procurement system and other support services to the rice producers. Since this study was conducted in only one upazila and data were collected from 100 rice producers which was a very small part of the population, findings may vary according to space; for that reason findings of the study should be considered very carefully.

ACKNOWLEDGEMENT

The authors would like to thank Ministry of Science and Technology, Government of the People's Republic of Bangladesh for funding through NST (National Science and Technology) fellowship to complete this research work smoothly within time frame. The authors wish to give cordial thanks and appreciation to the farmers in the study area who provided relevant data about this research work.

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