Knowledge Gap of the Farmers in Pulse Production

S. Kundu*, M. R. Islam and M. S. Ali

Department of Agricultural Extension & Information System, Sher-e-Bangla Agricultural University, Dhaka, Bangladesh (1207)

Correspondence to

*E-mail: shilpikundusau@gmail.com

Abstract

The study was designed and undertaken to understand the farmers' pulse production knowledge gap and to explore the contribution of the farmer with their selected characteristics. Raghdi Union of Muksudpur Upazilla of Gopalgonj District was purposively selected as the locale of the study. As research instrument an interview schedule was prepared, pretested, corrected, modified and then multiplied for data collection. Data were collected by the researcher herself from randomly selected 112 pulse farmers from three villages of the selected union. Knowledge gap of the farmers in pulse production was dependent variable and selected characteristics of the farmers were independent variables. Finding revealed that about two third (64.3%) of the respondents had medium to high knowledge gap in pulse production. Stepwise multiple regression analysis shows that out of 10 variables only 3 such as education, farming experience and economic motivation had negative contribution on knowledge gap in pulse production and they combinetly explained 45.8% knowledge gap and the rest of the variables do not enter into the regression model.

1. Introduction

Bangladesh is a country of 1,47,500 km² and it is geographically located between 20º34" and 28º88" north latitude and 80º 1" and 92º42" east longitude. Agriculture is the heart of Bangladesh. Bangladesh endowed with a favourable climate and soil for the production of different crops year round due to having a lot of rivers and tributaries. Heavy silts deposited by the rivers during the rainy seasons are continuously enriching the alluvial soil.

Pulses which are leguminous crops play an important role in agriculture and in the diet of people of Bangladesh. Its protein content is high compare to cereals and also eggs, fish and flesh foods as weight basis. Pulses have been considered as a poor man's diet since those are the cheapest source of protein. They occupy an area of about 0.3 mha (2.34% of the total cropped area and contribute about 1.07% of the total grain production of the country (Ahmed, 1985) The major pulses are grasspea, lentil, chickpea, mungbean, fieldpea etc. Among these grasspeas, lentil, chickpea and fieldpea are grown during winter season and contribute about 80% of the total pulse. Most of the pulse crops are grown in a few districts. These are Faridpur, Pabna, Jessore, Rajshahi, Kustia Rangpur, Tangail and Kishoregonj. Pulses also play an important role in providing valuable fodder and feed stuff to the cattle and poultry. Pulses have the remarkable quality of helping the symbiotic root rhizoid in fixing

atmospheric Nitrogen. Bangladesh produces more than 0.50 mt of pulses every year. Demand for pulses has increased with our increase in population. Bangladesh imported about 75000 MT of pulses every year at a huge foreign currency cost equivalent of Tk 960 million on average (1 USD=77 Tk as on 07.03.2013, approxmiately) (BBS, 2011). Recent experiences show that it is feasible to grow summer mung bean and black gram with proper management under the existing cropping patterns of the country. In addition to, Bangladesh endowed with a favourable climate and soil for the production of different crops year round.

As such it has gained priority for the generation of new technologies and in terms of research in pulses and onward transfer of those to the end-users. In Bangladesh, the modern and the HYV program was launched in the middle of 20th century. For this purpose, the government of Bangladesh has established agricultural research system to generate appropriate technologies and also extension system to transfer these technologies at the farmer levels to increase production. They develop a lot of modern varieties of different pulses and also develop different practices for production of these modern varieties. But at farmers' level, the yields of different varieties are not same as that of the research stations because farmers do not follow the entire package of practices. They do not know how to knowledge in application of recommended technologies at

recommended rate. As such there is large yield gap between the experimental stations and those of farmers' field. Prosperity of agriculture is generally measured by the level of production and the extent of probability.

To increase the production of pulses farmers need to adopt modern varieties as well as the appropriate practices as recommended. The recommended practices are balanced fertilizer application, timely and appropriate irrigation, modern recommended variety, time of sowing, weeding, and insect pests' control. Bhuiyan (2007) found that an overwhelming majority of the farmers of his study had knowledge gap in determining seed rate, age of seedlings, fertilizer doses- Urea, TSP and MP ranged from low to high knowledge gap. To make the pulse cultivation profitable, it is necessary to involve farmers in production, planning and ascertain problem with regard to pulse production. Low yield can be mitigated in the era when scientific knowledge is available and that knowledge is used appropriately.

On the basis of the above discussion, the researcher undertook an investigation entitled "Knowledge Gap of the Farmers in Pulse Production" with the following objectives:

a. To determine the knowledge gap of the farmers in pulse production
b. To determine and describe some selected characteristics of farmers
c. To explore the contribution of the selected characteristics of the farmers on their knowledge gap in pulse production

2. Materials and Methods

2.1. Study area, population and sample size

The study was conducted in purposively selected Raghdi union of Muksudpur upazila of Gopalganj district. Three villages namely Charprosonnodi, Raghdi and Domrakandi were randomly selected out of villages of Raghdi union as locale of the study. There were 223 pulse farmers in the study area. At the rate of 50% 112 farmers were randomly selected as the sample representing of the study.

2.1. Measurement of variables

In social science research normally independent and dependent variables are studied. Dependent variable is always influenced by one or more independent variables. The findings of the present study were based on the measurement of variables. Below how these variables were measured has been presented. Knowledge gap of pulse growers was the dependent variable of the study. It was measured based on knowledge of the growers on pulse production. The knowledge of a farmer on pulse production was determined through a knowledge score based on a set of 20 questions regarding modern recommended variety, sowing time, fertilizer application, irrigation, disease, pest

management, weed control. Each of the questions carried a full weight of 2. Then, knowledge score of a farmer was obtained by adding together his/her weight for all the 20 questions. Thus, knowledge score of a farmer could range from 0 to 40, where 0 indicates very low knowledge and 40 indicates highest level of knowledge on pulse production.

For determining knowledge gap of a farmer, a knowledge gap index was computed on the deviation of his/her obtained score from the maximum possible knowledge score (40). This deviation was then expressed in percentage as the proportion to his/her maximum possible knowledge score as suggested by Singh et al. (1991). For better understanding, the formula for determining knowledge gap index is presented bellow:

Where as,
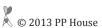
$$KGI = \frac{Kp-Ko}{Kp} \times 100$$

KGI = Knowledge Gap Index
Kp = Maximum possible score of a farmer (i.e. 40)
Ko = Obtained knowledge score by a farmer

Thus, the knowledge gap index could range from 0 to 100, where 0 indicated very low knowledge gap and 100 indicated the highest knowledge gap.

Moreover, age of a respondent was measured in terms of actual years from his/her birth to the time of interview. Education was measured in terms of grades of education completed by an individual from his/her educational institutions. Farm size of a farmer was determined in term of full benefit from cultivable land of the farmer. In the same way pulse production area of a farmer was measured in terms of total area of land under pulse cultivation of that farmer. On the other hand, farming experience of a respondent was measured on the basis of yearly farming practice on agriculture by the respondent himself. Total family income of a respondent was measured on the basis of total yearly earning from agriculture and other sources (service, business, daily labor etc.) by the respondent himself and other family members. Credit received by a respondent was measured on the basis of amount of money received by him from other individual or organization as loan. In addition to, agricultural input availability score of a respondent was measured by asking him/her about availability of inputs on five selected items of agricultural production regarding use of seed, fertilizer, farm implements, pesticide, irrigation etc. Moreover, economic motivation of a farmer was measured by an 'economic motivation score' using five point Likert type scale consisted of 10 statements (all positive) expressing some degree of economic profits or advantages. Furthermore, risk orientation of a farmer was also measured by the scale used by Ali (2008) with slight modification. The scale consisted of 10

statements (5 positive and 5 negative) expressing some degree of uncertainty or risk with five alternative responses.

2.3. Data collection and statistical procedure

Data for this study were collected from the respondents of three villages by using the pretest interview schedule by the researcher herself during 13 July, 2011 to 12 August, 2011.

Then the collected data were coded, compiled, tabulated and analysis in accordance with the objectives. The statistical measures used in describing the selected dependent and independent variables were frequency, percentage distribution, range, mean and standard deviation. Tables were used in presenting data for clarification of understanding. In order to explore the contribution of the selected characteristics of farmers to their knowledge gap, step wise multiple regressions were used.

3. Results and Discussion

3.1. Knowledge gap of the farmers in pulse production

Knowledge gap of the respondents ranged from 20-75% in accordance with scoring system against the possible range of 0-100% with the mean of 41.48 and standard deviation (SD) of 14.29. On the basis of knowledge gap, the farmers were classified into three categories as shown in Table 1.

Knowledge gap for crop production is very harmful. In want of proper knowledge, crop production may failure totally. Data shown in the Table 1 indicate that majority (56.3%) of the farmers of the total respondents had medium knowledge gap while 35.7% had Low and 8.0% had high knowledge gap for pulse production. Findings again revealed that about two third (64.3%) of the respondents had medium to high knowledge gap in pulse production. In this study more than fifty percent of the respondents have medium knowledge gap in pulse production but still now pulse production area is decreasing day by day.

3.2. Selected characteristics of the farmers

The researcher of the study selected some personal and socio-economic characteristics of pulse crop growers as the independent variables which affect the farmers knowledge gap in pulse

Table1: Distribution of the farmers according to their knowledge gap in pulse production

Categories (score)	Observed Range	Respondents Number	%	Mean	SD
Low (0-33)	20-75	40	35.7	41.48	14.29
Medium (34-66)		63	56.3		
High (67-100)		9	8.0		
Total		112	100		

production. The independent variables are: age, education, farm size, pulse production area, farming experience, annual family income, credit received, agricultural input availability, economic motivation and risk orientation (Table 2).

Table 2 showed that majority of the respondents was middle aged (53.6%), medium economically motivated (54.5%). It also indicated that majority of the farmers had secondary level of education (39.4%), long farming experience(54.5%), medium availability of agricultural input(41.9%), medium risk orientation(56.2%) and highest proportion (52.68%) of the farmers had small farm, above three forth (75.9%) of the respondents had small area. It also indicated that the highest proportion (48.2%) of the respondents had low annual family income and highest proportion (53.6%) of the respondents (farmers) did not receive any credit.

3.3. Contribution of the selected characteristics of farmers on their knowledge gap in pulse production

For this study ten characteristics of the respondent were selected and each of the character was treated as independent variables. The selected characteristics were age (x_1), education (x_2), land size (x_3), pulse production area (x_4), farming experience (x_5), annual family income (x_6), agricultural input availability (x_7), credit received (x_8), economic motivation (x_9) and risk orientation (x_{10}). Knowledge gap in pulse production (Y) was the only dependent variable of this study. Stepwise multiple regression analysis was done to find out the contribution of the selected characteristics of farmers on their knowledge gap in pulse production. The results of stepwise multiple regression analysis is described below:

It was observed that out of 10 variables only 3 independent variables namely education (x_2), farming experience (x_5) and economic motivation (x_9) were entered into the regression equation. The other seven variables were not entered into regression equation. The regression equation so obtained is presented below:

$Y= 78.158 - 0.439X_2 - 0.411 X_5 - 0.206X_9$

Multiple R = 0.687

R-square = 0.472

Adjusted R-square = 0.458

F-ratio = 32. 237

Standard error of estimate = 10.523

Constant =78.158

The multiple R and R^2 values were found 0.687 and 0.472 respectively and the corresponding F-ratio was 32.237 which were significant at 0.000 levels. For determining unique contribution of each of the three variables the increase in R^2 value was determined on knowledge gap in pulse production. These three variables combinetly explained 45.8% of the total variation in knowledge gap of farmers in pulse production.
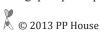
Table 2: Selected characteristics of the farmers

SL.No	Characteristics	Categories	Number	%	Mean	SD
1	Age	Young (upto 35)	25	22.3	42.71	9.38
		Middle aged (36-50)	60	53.6		
		Old (Above 50)	27	24.1		
2	Education	Illiterate (0)	17	15.2	5.20	3.96
		Can sign only (0.5)	17	15.2		
		Primary (1-5)	27	24.2		
		Secondary (6-10)	44	39.4		
		Above secondary (above 10)	7	6.3		
3	Farm size	Small farm (0.2-1.0)	59	52.68	1.45	0.89
		Medium farm (1.01-3.0)	44	39.29		
		Large farm (Above 3.0)	9	8.03		
4	Pulse production area	Small area (0.2-0.5)	85	75.9	0.49	0.31
		Medium area (0.510-1.0)	17	15.2		
		Large area (Above 1.0)	10	8.9		
5	Farming experience	Short farming experience (up to 10)	12	10.7	25.25	10.71
		Medium farming experience (11-20)	39	34.8		
		Long farming experience (above 20)	61	54.5		
6	Annual family income	Low income (up to 100)	54	48.2	137.16	90.29
		Medium income (100.1-200)	43	38.4		
		High income (above 200)	15	13.4		
7	Credit received	No credit received (0)	60	53.6	12.54	16.57
		Low credit received (1-15)	17	15.2		
		Medium credit received (16-30)	21	18.7		
		High credit received (above 30)	14	12.5		
8	Agricultural input availability	Low (6-9)	33	29.5	10.96	2.19
		Medium (10-12)	47	41.9		
		High (above 12)	32	28.6		
9	Economic motivation	Low (10- 23)	9	8	34.13	6.87
		Medium (24-37)	61	54.5		
		High (38-50)	42	37.5		
10	Risk orientation	Low (10-23)	15	13.4	32.75	7.46
		Medium (24-37)	63	56.2		
		High (38-50)	34	30.4		

Table 3: Summary of step wise multiple regression analysis showing the contribution of selected characteristics of the farmers on their knowledge gap in pulse production

Variables entered	Standardized Partial 'b' Coefficients	Value of 't' (with probability level)	Adjusted R^2	Increase in R^2	Variation explained (%)
Education (x_2)	- 0.439	-5.190(.000)	0.258	0.258	25.8
Farming experience (x_5)	- 0.411	-5.841(.000)	0.433	0.175	17.5
Economic motivation (x_9)	- 0.206	-2.439(.016)	0.458	0.025	2.5
			Total	0.458	45.8

Education alone contribute 25.8% of the variation followed by farming experience (17.5%) and economic motivation (2.5%) variation in knowledge gap of the farmers.

Table 3 showed that education, farming experience and economic motivation had significant contribution on knowledge gap in pulse production that mean the farmers who had more

education, long farming experience and higher economic motivation were found to have less knowledge gap in recommended practices in pulse production.

4. Conclusion

Majority (56.3%) of the farmers of the total respondents had medium knowledge gap for pulse production. Findings again revealed that about two third (64.3%) of the respondents had medium to high knowledge gap in pulse production. Therefore, it may be concluded that there is necessity to reduce the knowledge gap of the farmers in pulse production.

5. Suggestion

Education, Farming experience and Economic motivation had negative influence on knowledge gap in pulse production. Therefore, it may be recommended that attempts should be taken to increase education level of the farmers by establishing adult training center which ultimately could decrease their knowledge gap in pulse production and priority should be given by the concern authorities for enhancing economic motivation and risk orientation of the farmers through demonstrations, field days, formal training, meeting orientation and other motivational campaign.

6. References

Ahmed, K.U., 1985. Use of scarce land and water resources to meet food and nutritional goals presented at the workshop on low water use cropping system for irrigated agriculture, 13-24th Oct 1985, Bangladesh Agricultural Research Council (BARC), Bangladesh. Farmgate, Dhaka, Bangladesh, 188.

Ali, M.S., 2008. Adoption of Selected Ecological Agricultural Practices by the Farmers. Thesis (PhD. Ag. Ext. Ed.), Department of Agricultural Extension Education. Bangladesh Agricultural University, Mymensingh, Bangladesh, 75-78.

BBS. 2011. Statistical yearbook of Bangladesh. Bangladesh Bureau of Statistics, Statistical Division, Ministry of Planning, Government of Peoples Republic of Bangladesh, 68-70.

Bhuiyan, M.H. 2008. Knowledge gap of farmers in adoption of rice production technologies. Journal of Agricultural Education and Technology 11(1&2), 145-154.

Singh, S.P., Hudda, R.S., Verma, H.K., 1991. Knowledge gap of Citrus Growers. Indian Journal of Extension Education XXVII (1&2), 117-120.