

## **ADOPTION OF MODERN MAIZE CULTIVATION IN KAPASIA UPAZILLA UNDER GAZIPUR DISTRICT**

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Accepted for publication: 28 September 2006

### **ABSTRACT**

**Huda, M. Z., Haque, M. E., Kabir, M. S. and Akhter, R. 2006. *Adoption of Modern Maize Cultivation in Kapasia Upazilla under Gazipur District. Int. J. Sustain. Crop Prod. 1(2): 39-43.***

The study was attempted to describe some selected characteristics of the farmers of study area, to determine the adoption behavior of the farmers towards modern maize cultivation, and to explore the relationships between each of the selected characteristics of the farmers and their adoption of modern maize cultivation. The study was conducted in Kapasia upazilla of Gazipur district. Hundred respondents were selected following stratified random sampling technique. Data were personally collected by the researchers, compiled and interpreted as per objectives of the study. It was found that sixty five percent of the farmers had medium to high level of adoption of maize cultivation. Farm size, annual income, training duration and extension contact of the respondent showed significant positive relationship with their adoption of modern maize cultivation.

**Key words: Maize, adoption and cultivation**

### **INTRODUCTION**

Maize has always been considered as a minor crop in Bangladesh. Sporadic attempts were made to promote maize cultivation in the past but remained static for a long time. Farmers of Bangladesh were not well experienced in commercial maize cultivation. Recently, they have been influenced by a number of government organizations and NGOs for adoption of modern maize cultivation. Maize can and will play an important role along with other cereals in meeting future need of growing population. Experts pointed out that rapid switch over to hybrid maize seeds from the traditional composites seeds held the magic behind Bangladesh's earning the distinction of highest maize yielding country in Asia. National Agricultural Policy (NAP) of 1999 said "Production of maize has shown good result in the last two years. Maize has also gained popularity as a food side by side with the poultry feed.

Public sector procurement of maize has been introduced like rice and wheat in order to encourage farmers in maize cultivation. The efforts for increasing area and production of maize will be strengthened.

Maize production is increasing in Bangladesh day by day. A dramatic change in maize production had already been observed in Bangladesh in the 1990s. Needless to say that research on the adoption of modern maize cultivation is a timely attempt in order to formulate long-term strategy. Research work on the adoption of maize cultivation is rarely available or about to nil. This fact lead the researcher to undertake the study entitled, "Adoption of Modern Maize Cultivation in Kapasia Upazilla under Gazipur District". It might be expected that findings of the study would be helpful to the concerned personnel and organization for the development of maize production. In view of the forgoing discussion, the following specific objectives were formulated to give proper direction to the study. i) To describe some selected characteristics of the farmers of study area. ii) To determine the adoption behavior of the farmers towards modern maize cultivation. iii) To explore the relationships between some selected characteristics of the farmers and their adoption of modern maize cultivation

### **METHODOLOGY**

The study was conducted in Kapasia upazila under Gazipur district. Three union of Kapasia upazila named Shingashri, Rayed and Tok were selected purposively as the locale of the study. In consultation with the Upazila Agriculture Officer (UAO), Kopalesware, Bitipara, Hyled villages were selected as the locale of the study. A list of the farmers of this village was prepared with the help of local Sub Assistant Agricultural Officer (SAAO) of the locale. All the maize growers of the study area for Rabi season of 2004-2005 constituted the population of the study. The numbers of maize growers in three selected villages were approximately 1425. Out of them 100 farmers was selected using stratified random sampling technique with probability proportional to the size. In order to collect reliable and valid information from the maize growers, an interview schedule was prepared carefully in line with the objective of the study. The interview schedule contained both open and closed form questions. Appropriate scales were also developed to operationalize the selected characteristics of the maize growers. The researchers themselves collected data from the sampled farmers through the personal interviewing during the November 25 to December 25, 2005. The statistical measures as number, percentage, mean, standard deviation use in describing the variables. For exploring the relationship between selected characteristics of the respondents and their adoption to modern maize cultivation, correlation coefficient (r) with cross tabulation analysis was used. Through out the study, 5% level of significant was used for rejecting or accepting null hypothesis.

**Selection of the variables**

Nine characteristics of the maize growers were considered as independent variables while adoption of modern maize cultivation was considered as dependent variable of this study.

**Measurement of dependent variable**

Extent of adoption of modern maize cultivation was the dependent variable in this study. It was measured by computing the Adoption Quotient formula developed by Chattataphyay (1963).

$$\text{Adoption Quotient} = \frac{\sum_{j=1}^N (Y_j W_j)}{\sum_{j=1}^N W_j} \times 100 \quad \text{Where, } Y_j = \frac{\sum_1^{t_p-t_1} e_j}{t_p - t_1}$$

**RESULTS AND DISCUSSION**

**Demographic characteristics of the farmers**

Behavior of an individual is determined to a large extent by his personal characteristics of the respondents were identified for investigation in this study. These characteristics are discussed in the Table 1.

Table 1. Characteristics profile of the maize growers

Characteristics	Scoring method	Categories	Grower		Mean	Standard deviation
			Number	%		
Age	Number of years	Young (18-30)	31	31.0	36.52	9.26
		Middle age (31-50)	52	52.0		
		Old (>50)	17	17.0		
Education	Year of schooling	Illiterate	12	12.0	57590	34121.75
		Primary level education	28	28.0		
		Secondary level education	56	56.0		
		Higher education.	4	4.0		
Farm size	Area in hectare	Marginal (<.02)	0	0.0	0.89	0.92
		Small (.02-1.00)	80	80.0		
		Medium (1.01-3.03)	13	13.0		
		Large (>3.03)	7	7.0		
Annual Family income	Thousand (Taka)	Low income (Up to 30,000)	25	25.0	57590	34121.75
		Medium income (30,000-50,000)	35	35.0		
		High income (>50,000)	40	40.0		
Extension contact	Scale of score	Low extension contact (Up to 23)	38	38.0	-	-
		Medium extension contact (23-25)	45	45.0		
		High extension contact (Above 25)	17	17.0		
Cosmopolitaness	Scale of score	Low cosmopolitaness (6-12)	7	7.0	16.42	2.35
		Medium cosmopolitaness (13-18)	76	76.0		
		High cosmopolitaness (18-24)	17	17.0		
Training experience	Scale of score	No training	16	16.0	-	-
		Short (1day training)	48	48.0		
		Medium (2-4 days training)	24	24.0		
		Long (more than 4 days)	12	12.0		

**Age**

The farmers' age ranged from 18 to 58 years and the average age was 37 years. For the analysis purposes, age of the respondent was broken into three categories according to Roy (1996): As shown in Table 1, the highest proportion (52%) of the respondents were in middle aged groups as compared to 17% who were old and 31% of the respondents were young. The age of an individual is an important social factor in many aspects. It is one of the most imperative factors pertaining to one's personality make up. It is a norm in most traditional cultures that people respect the elder people, seek advice from them and obey their decision. The elders are important as they have long experience in many spheres of life.

### ***Education***

Empirically education was defined as the number of successful years spent by the respondent in receiving formal education. Educational scores of the respondent ranged from no formal education to above Higher Secondary. Analysis of data contained in Table 1 indicating that 56% respondent had secondary level education compare to 28% respondent had primary level education, compared to 12% illiterate and 4% higher education. So from the above figure it found that about 88% of the respondents were educated either in primary, secondary or higher level. The literacy of the farmers is an important factor, which determines their communication behavior. More particularly, it allows one to have access to the printed media.

### ***Farm size***

Following national farm size category (Anon, 2002), the respondent were classified into four categories Data concerning the farm size of the farmers are shown in Table 1. Farm size of the respondent ranged from 0.12 ha to 5.01 ha with an average of 0.89 ha. As shown in Table 2, the highest proportion (80%) of the respondents had small farm size followed by medium (13%) and large (7%) farm size respectively. The farm size is highly associated with cultivation size. It contributes to gross and net income. Larger farmers are more associated with different village based groups or organizations. These farmers generate more feedback information about innovations. It is note that the total percentage of small and medium farms comprised about 93% of the total farm size. It might be an indication that small and medium farmers were more interested for cultivation of maize. That might be reason that the percentage of the large farmers involved in maize cultivation activity was much lower.

### ***Annual income***

Annual income of a respondent was determined on the basis of his total earnings from agriculture and non agriculture sources. The income of the respondents ranged from Tk. 30,000 to Tk. 1, 40,000. As shown in Table 1, 40% respondents were in high income 35% medium income and 25% low income respectively. Table 1 indicated that standard deviation of annual income of the respondent was high. So, respondents of the study area were heterogeneous in nature asserting to their annual income.

### ***Extension contact***

The computed overall contact scores of the respondents based on extension contact ranged from 19 to 29 and the average being 24. Based on the extension contact scores, the respondent were classified into three categories as following manner. As indicated in Table 1, most of the respondents had medium (45%) extension contact followed by low (38%) and high (17%) extension contact respectively. Extension contact pertains to ones contact with multifarious sources of knowledge and information. This results in cognitive change of the respondent with an eventual change in skill. Findings revealed that 38% of the respondent had low extension contact which demands for strengthening and improving the communication strategy of DAE. Low extension contact mighty be the reason that some farmer may think that they have enough knowledge about maize production technologies; they need not contact with extension personnel. They need only production input (seed, fertilizer, pesticide etc.)

### ***Cosmopolitaness***

The computed cosmopolitaness scores of the respondents ranged from 6 to 24 with mean and standard deviation 16.42 and 2.35 respectively. On the basis of the calculated score, farmers were classified into the following three categories. According to the Table 1, it was found that the highest proportion (76%) of the respondents was in medium cosmopolitaness category, while 17% were high and 7% were low cosmopolite category. The communication system is most of the cases in our country is developing day by day. So the farmers of the country have an opportunity to visit different places, and thus about 93% of the respondents were medium and high cosmopolitaness.

### ***Training received***

Training is a gender unbiased participatory technology transfer system which has proved to be effective in disseminating production technologies. It has also been proposed and tested for modern maize production technology transfer (Anon. 2002). Data present in Table 8 indicate that the majority proportion 48% of the respondents had short training while 24% received medium 12% received long training. But 16% of the respondent did not receive any training. Training plays an important role in innovating farmers for adopting modern technologies. Hence, in the study area short day "Whole Family Training in Maize" was intensively conducted by CMMYT. That is why about 90% of the respondent received training in any form.

### ***Adoption of modern maize cultivation***

The measure of success of any program aimed at community development in the country has a direct relation to extent to which the related new ideas are adopted by the clientele. It is therefore, necessary to have an

understanding of the adoption of relevant innovations which helps in rendering proper guidance for planning and execution of development programs. Such considerations influence the need for understanding the adoption behavior of farmers in respect of maize cultivation (Rogers, 1995).

The researcher calculated the adoption of maize cultivation by using the formula of adoption quotient where the entire related concept like potentiality, extent, time, consistency and weightage were used. It was found that respondents' adoption of maize cultivation ranged from 15 to 47 with mean 30.02 and standard deviation 9.99.

Table 2 Distribution of the respondents according to their extent of adoption

Categories	Respondent		Mean	S.D.
	Number	Percentage		
Low adoption1 (5-24)	35	35		
Medium adoption (25-34)	28	28	30.02	9.99
High adoption (>35)	37	37		
Total	100	100		

Data presented in Table 2 indicated that 35 % of the respondents had low adoption while 28% had medium adoption. Satisfactory number of the respondent (37%) had high adoption of maize cultivation. So it is clear from the Table 2 most of the respondent of the study area was high and medium adoption.

#### ***Relationship between selected characteristics of the respondents and their adoption of maize cultivation***

Table 3. Coefficient of Correlation (r) between the selected characteristics of the respondent and their adoption (N = 100)

Farmers selected characteristics	Value of "r" with 98 df
Age	-0.205*
Education	-0.070 <sup>NS</sup>
Farm size	0.465**
Annual income	0.296**
Cosmopolitaness	0.102 <sup>NS</sup>
Training duration	0.197*
Extension communication	0.290*

\*\*Significant at 1% level, \*Significant at 5% level, <sup>NS</sup> Non Significant

#### ***Age and adoption to modern maize cultivation technologies***

The relationship between age of the respondents and their adoption to modern maize cultivation was examined and found that age of the maize growers had a significant negative relationship with their adoption to modern maize cultivation (Table 3). This finding indicates that the less is the age of the farmers the more was their adoption to a modern maize cultivation. It could be said that young farmers had favorable tendency to adopt modern maize cultivation technologies.

#### ***Farm size and adoption to modern maize cultivation***

Table 3 claimed that the farm size of maize growers had a significant positive association with their adoption of modern maize cultivation. It means that larger the farm size, grater the extent of adoption to maize cultivation. This finding also indicates that the maize growers, who had more land for maize cultivation, had a tendency toward more adoption to modern maize cultivation.

#### ***Annual income and adoption to modern maize cultivation***

There was significant positive relationship between the annual income of the farmers and adoption of maize cultivation (Table 3). This means that increased annual income of the farmers enable them to adoption maize cultivation. It may be said that increased income enable the farmer to invest for seed, fertilizer, irrigation etc which may led to adopt new technology.

***Agricultural training duration and adoption to modern maize cultivation***

Table 3 represents that training duration of farmers had a significant positive relationship with their adoption to modern maize cultivation. This finding indicates that the maize growers who were more training duration had more adoption in maize cultivation.

***Extension contact and adoption to modern maize cultivation***

Table 3 reveals that extension contact of farmers had a significant positive relationship with their adoption to modern maize cultivation. The finding implies that the more the extension contact of the farmers had more was their adoption to modern maize cultivation. It revealed that percentage of the respondent who had medium and high extension contact also had higher adoption of maize cultivation compared to the respondent who had low extension contact and vice-versa.

It was found that more than half of the respondents were medium to high in terms of overall adoption. Hence, it might be concluded that status of adoption was satisfactory. Introduction of maize in the farming system in a planned way has been a recent phenomenon. Farmers having high income had increased financial ability to make investment for adoption of modern technologies in maize cultivation. Training exposure of the growers had significant positive relationship with their adoption to modern maize cultivation. But unfortunately, the majority of the farmers had only 1-3 days training. if the training exposure of the growers could be increased, the adoption to modern maize cultivation would also be expanded.

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