



Report on the Cost of Production of Boro Paddy 2008-09



**Updating and Extension of Agriculture Cluster Plots and Survey of Cost of
Production Project (UCPSCP)
BANGLADESH BUREAU OF STATISTICS
Statistics Division
Ministry of Planning**



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Foreword

Bangladesh is predominantly a agricultural country. Although, the contribution of industrial sector to the gross domestic product (GDP) is gradually increasing over the decades, till date, the agriculture sector has been dominating the economy of Bangladesh. Most importantly, food security of the country is critically dependent on the domestic production of crops.

Crop Production is very much related to its production cost. Every year government declares procurement prices before harvesting time for different crops. UCPSCP Project of Bangladesh Bureau of Statistics has undertaken the survey of 10 crops (6 major crops and 4 minor crops) with an aim to estimate the cost of production.

I am very glad to know that the UCPSCP Project performed successfully to conduct these surveys for the first time. I hope that the data presented in the publication would be helpful for the policy formulations and planning process of the country.

I extend my thanks to the Director General, BBS, the Project Director and other officials who worked hard to prepare the report.

Dhaka,
November,2010

Riti Ibrahim



Director General
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Preface

Agriculture is the basic culture of Bangladesh. From the time immemorial, the main source of livelihood of the population of this land is agriculture. It plays an important role in the economic development of the country and has a great contribution to the Gross Domestic Product (GDP).

Crop production largely depends on weather variables such as rainfall, temperature, humidity etc. Moreover, Bangladesh is known as a country of natural calamity in the world. Government is fully aware of natural disaster. Government has been allocating considerable annual budget for the development of agriculture and launching different programmes one after another in order to boost up crop production.

In order to formulate proper policy and planning for the development of agriculture sector reliable and realistic data regarding production cost of crops by different phases such as leasing value of the land, land preparation, seeds/seedlings, weeding, insecticides, fertilizers, harvesting, drying etc. are needed. Keeping these issues in active consideration, the UCPSCP Project under the control of the Bangladesh Bureau of Statistics (BBS) has been given the responsibility of surveying 10 crops (Aus, Aman, Boro, Jute, Wheat, Potato, Maize, Oil Seeds, Onion and Pulses) for the first time for deriving the cost of production of crops by interviewing farmers in field.

I express my deep gratitude to the members of the Technical Committee who rendered technical guidance for the selection of sampling units and finalization of questionnaire for the survey purpose and other survey matters.

I would like to thank all those who are associated in different works of the survey. I take opportunity to convey thanks to Mrs. Salima Sultana, Project Director and other officers and staff members of BBS who worked very sincerely to finalize the report.

Dhaka,
November, 2010

Md. Shahjahan Ali Mollah

Contents

		Page #
	Foreword	i
	Preface	ii
	Contents	iii-iv
	Key Findings At a glance	v-vi
Chapter-1	: 1. Introduction	3-6
	1.1 The major food crop of Bangladesh	
	1.2 Production of Boro	
	1.3 Scope and Coverage	6
	1.4 Objectives of the survey	6
Chapter-2	: 2. Methodology	9
	2.1 Sample Design	9
	2.2 Data Collection	11
	2.3 Tabulation	18
	2.4 Data Analysis and dissemination	18
	2.5 Data dissemination	18
Chapter-3	: 3 Statistical findings	21
	3.1 Boro producing HHs	21
	3.2. Sample area under Boro crop	22
	3.3. Land tenureship	24
	3.4. Leasing cost	26
	3.5. Cost of land preparation	27
	3.6. Seeds cost	30
	3.7. Fertilizer cost	31
	3.8. Insecticides cost	35
	3.9. Irrigation cost	37
	3.10. Labourer cost	39
	3.11. Number of family and hired labourers	43
	3.12 Others cost	46
	3.13. Production cost	47
	3.14. Production and value	50
	3.15. Productivity	51
	3.16. By size of land planted of Boro	52
	3.17. Sampling error and data reliability	55
Chapter-4	: 4 Statistical Table	59
	Annexure	
Annexure-A	Concepts and Definitions	66
Annexure-B	Statement-I	69
Annexure-C	Survey Questionnaire (Bangla)	70
Annexure-D	Reference	72

Key Findings: At a glance

SL. No.	Items of study	Result
1.	Percentage of household having Boro cultivation in the sample area	44.67
2.	Percentage of household having Boro cultivation actually enumerated in the sample area	17.63
3.	Percentage of household growing Boro by land tenure:	
	a. Own	67.28
	b. Share cropping	16.12
	c. Mortgage	7.83
	d. Lease	7.62
	e. Others	1.15
4.	Yield of Boro paddy per acre(in maund)	55.00
5.	Yield of Boro straw per acre (in maund)	40.65
6.	Number of labourers employed by phase for per acre production of Boro	
	a. Seed-bed preparation	3.08
	b. Plucking of seedlings	3.52
	c. Sowing/Planting	11.34
	d. weeding	12.21
	e. Harvesting	13.53
	f. Thrashing	5.52
	Total	46.40
7.	Number of family labourers worked for per acre Boro production	11.25
8.	Production cost of Boro paddy per kilogram (in taka)	12.62
9.	Farmgate price of Boro paddy per kilogram (in taka)	14.15
10.	Farm-gate price of straw per kilogram (in taka):	1.39
11.	Cost of land preparation per acre per acre (in taka):	1882
12.	Cost of seeds per acre per acre (in taka)	467
13.	Cost of seed-bed preparation per acre (in taka)	554
14.	Cost of plucking of seedlings per acre (in taka)	585
15.	Cost of planting of seedlings per acre (in taka)	1704
16.	Purchasing of seedlings per acre(in taka)	489

Key Findings: At a glance

SL. No.	Items of study	Result
17.	Cost of fertilizers by type per acre (in taka):	
	a. Urea	1123
	b. TSP	1076
	c. MoP	608
	d. Zinc	72
	e. Gypsum	77
	.f. Organic	231
	g. Other Cost	124
	Total	3315
18.	Cost of insecticides per acre (in taka)	458
19.	Cost of weeding per acre (in taka)	9425
20.	Cost of irrigation per acre (in taka)	1742
21.	Cost of harvesting per acre (in taka)	2214
22.	Cost of thrashing per acre (in taka)	829
23.	Cost of leasing per acre (in taka)	3717

Chapter-I

Introduction

Introduction

Bangladesh is an agricultural country. The most of her inhabitants directly or indirectly are involved in agricultural activities for their livelihood. Agriculture has a great contribution to the Gross Domestic Product (GDP) of the country. Earlier more than 50% of GDP came from this sector. When industrialization starts happening the activities of the population starts diversification towards different sectors. As a result, the contribution of the agriculture sector is slowly reducing and now reached 19% share of GDP. Still agriculture plays vital role and is known as the most important sector of the economy.

Bangladesh by birth possesses very fertile land in which diversified crops grow very easily. Various types of crops are produced in this country. These crops might have been categorized into two-food crops and cash crops. Three types of paddy namely aus, aman and Boro and another cereal crop, wheat are produced in this country, which are called major cereal crops. Rice is the staple food of the people of Bangladesh. Boro is the most important cereal crop which shares about 57% of total rice production (BBS estimate 2008-09). The production of Boro largely depends on the use of fertilizers, irrigation etc. The Government of Bangladesh has, therefore, provided top most priority to the agriculture sector specially on food crop to increase the production of cereals by giving subsidy to the farmers on different inputs such as fertilizer, irrigation etc. to achieve self sufficiency in food.

Poverty cannot be reduced to a desired level excepting increasing productivity of agriculture sector and at the same time it is to be assured that farmers get fair price of the crops. Natural calamity like draught, flood, cyclone, tornado etc. is a very regular phenomenon which hinders the production of agriculture at a great extent. Cultivable land is being decreased due to the pressure of massive population. As a result, food security is being threatened and the risk of poor people is being increased.

Bangladesh government is remarkably concerned about this agriculture sector. Notable portion of annual budget has been consistently been allocating for the last couple of

years for the development of the sector. Government has also been launching many programmes one after another in order to boost up the agriculture production.

Production of crops, cost of production of crops and market price of crops are directly interrelated. Government has to give proper attention on these three factors as stated so that the farmer get fair price of the crop produced during the harvest time. Generally, Government has to declare procurement price at the harvesting time of the crop so that producer get proper price. Procurement price of the crop has to be fixed considering all these matters. If procurement price is lower than the production cost, producers get looser and discouraged to produce more crops and if procurement price is higher than the production cost, producers get profit and encouragement. This type of loss and profit influences positively or negatively on the cultivation of next year's crops. So, an objective survey is necessary to know the cost of production of crops at farmer's level. And as such this project has been given the responsibility of conducting a survey in this regard.

1.1. Boro : The major food crop of Bangladesh.

The paddy which is planted in mid November to February and reaped in the month of April to June, is called Boro. There are three types of Boro namely-Local Boro, High Yielding Variety (HYV) Boro and Hybreed Boro. Presently Boro tops the list of paddy production.

Local Boro : From time immemorial this type of paddy has been cultivating in our country and is said to be local variety Boro. Planting time of this variety is mid November to December and harvesting time is April to May. It gives relatively lower yield rate.

HYV Boro: The name HYV has been originated for its high yielding capacity. In the decade of 1960, HYV was introduced and through the pass of time this HYV has been extended very rapidly to meet the demand of the cereals in the market. Time of transplantation of HYV is mid December to February and reaping time is May to June.

It demands adequate irrigation, fertilizer, insecticides and intercultural practices and farmers have to invest more money for the application of these inputs.

Hybreed Boro : This variety has brought revolutionary change in respect of yield rate. The sowing and harvesting time of Hybreed Boro is the same as that of HYV. The seeds are very much environment sensitive and farmers cannot preserve the seeds domestically. These are preserved in seeds producing institutions. And farmers have to procure seeds from these institutions.

1.2. Production of Boro:

Bangladesh occupies most lands of the Great Bengal plane of the Ganges Delta with affluent alluvial soils. Moreover, it is a riverine area with plentiful water resources with hot and humid monsoon climate. All these factor have made Bangladesh the most significant for paddy cultivation in the world. However the overall natural climatic and geographic condition of Bangladesh is blissful for growing paddy. Moreover the time of Boro production is more or less free from natural hazards.

Table : Acreage, production and yield rate of Boro rice during the last ten years.

Year	Area in '000' acres	Production in '000' M. Tons	Yield rate M. tons
1998-99	8715	10552	1.211
1999-00	9024	11027	1.222
2000-01	9296	11921	1.128
2001-02	9319	11766	1.263
2002-03	9500	12222	1.286
2003-04	9745	12838	1.317
2004-05	10047	13837	1.378
2005-06	10047	13975	1.391
2006-07	10522	14965	1.422
2007-08	11386	17762	1.560

Source: Year Book of Agricultural Statistics of Bangladesh 2008.

Table. shows that during last ten years Boro has been cultivated at the highest area of 11386 thousand acres in 2007-08. Boro cultivation is increasing significantly because of the demand of cereals. During the last ten years, the production of Boro crop is increasing gradually year by year. This is true for yield rate also.

1.3. Scope and coverage of the survey:

Survey on the production cost of Boro paddy 2008-09 is a household based survey. Under the purview of this survey the target population was all dwelling households of the sample area. Ten separate surveys for 10 crops like Aus, Aman, Boro, Potato, Jute, Wheat, Maize, Onion, Oilseeds and pulses are conducted following the same sampling design. A target sample of 100 upazilas are selected from 64 districts to capture the rare crops like onion, oilseeds and pulses, where the rest seven crops are believed to be available.

1.4. Objectives of the survey:

The specific objectives of the survey are:

- ▶ to estimate per acre production cost of Boro.
- ▶ to estimate per kilogram production cost of Boro.

The other objectives of the survey are as follows:

- ▶ to know the area under Boro by land tenure
- ▶ to assess the cost of production of Boro by different phase
- ▶ to produce benchmark data on the production cost of Boro
- ▶ to assist the policy maker by supplying data on the cost of production of Boro in order to formulate appropriate policies for increasing the production of Boro crop

Chapter-II

Methodology

Methodology

2.1. Sample Design:

Sample design is the most important aspect of a survey, which strongly affects survey results. An integrated sample design for conducting survey on the cost of production of 10 crops has been developed. Boro is one of the 10 crops. Sample design has been discussed in detail below:

2.1.1 Universe:

Bangladesh as a whole is taken as the universe of the survey.

2.1.2 Sampling Technique:

Multi-stage sampling technique has been followed.

2.1.3 Sampling Frame:

The list of Districts, Upazilas, and the Mauzas, having the particular crop Boro, are used as the sampling frame.

2.1.4 Detailed Sample Design:

As this survey is a part of the sample survey on cost of production of 10 crops such as Aman, Aus, Boro, Wheat, Jute, Potato, Maize, Oil Seeds, Pulses and Onion, the sample design for aus crop has been followed the same design as the integrated sample design for the said 10 crops. The sample design has been explained below:

A national sample survey on cost of production of 10 major and minor crops already conducted by the BBS was a complex survey. If the survey had been conducted separately for each crop, it would be very simple and straight forward. But as it had been conducted by a single survey, it became complex. The crops have different acreages ranging from below 1 percent (0.72%) for maize to 35% for Aman crop and they are grown at different times of the crop year. While Aman, Boro and Aus are grown throughout the country, other crops are not grown so widely. Furthermore, cultivation of some minor crops is rare and localized. They grow heavily in some places and do not grow at all in other places of the country. Estimates at sub-national level, say at divisional level, for such minor crops became difficult.

2.1.5 Sample Size Determination

The total acreages and the percentages of acreages of these crops obtained from Sample Survey of Agriculture, 2005 are shown in Statement-I (See Annex- B). The gross cropped area in the country is 299, 90,170 acres as per the Sample Survey of Agriculture, 2005. Using these percentages of acreage of these crops in the country, the minimum sample size for each of these crops is determined in statement-1 applying the following equation which is popularly used for determination of sample size with error and confidence level 95%:

$$n = \frac{pq(1.96)^2}{e^2}$$

Where,

P= Proportion of a crop to total gross cropped area

q=1-p

e= Error level (5% error level is used in this case)

If the survey was conducted for each crop separately drawing the sample from the national frame of the crop all over the country, the sample size (n) as shown in statement-1 would be sufficient to provide cost estimate of the crop with 95% confidence level for the country as a whole. But if divisional estimate is necessary for the crops, n should be 6 times more than the national estimate as given in the statement to conduct the survey for the crop at divisional level. If the samples are drawn independently for each crop then they are likely to be distributed in many Upazilas all over the country resulting higher cost for both increasing man power and traveling distance. With the objective of reducing cost of the survey, the sample is drawn for one crop namely, oil seeds which is distributed almost throughout the country, where n=103. The minimum sample number required for all divisions is (103 X 6) 618 farms growing oil seeds.

2.1.6 Selection Procedure

If divisional estimates are required for all crops, it is pre-determined that primary sampling units (PSUs) i.e. Upazilas should be selected from 64 districts. It is also decided that at least 100 Mouzas/Eas (Enumeration Area) as Secondary Sampling Units should be selected from 64 districts. The selected Mouzas/EAs will consist of about 250 households. The farm households growing the particular crop are the ultimate sampling unit in the survey. All farm households growing the particular crop in the selected Mouzas/EAs have been interviewed in the survey.

A total of 100 Upazilas have been selected randomly from 64 districts. At first 64 Upazilas having minor crop oil seeds are selected from 64 districts and then the remaining 36 Upazilas have been selected from the districts having higher number of Upazilas growing the particular crops excluding Chittagong hill districts. One Mouza/EA have been selected from each of the 100 selected Upazilas having the highest acreage of the particular crop (oil seeds) and the selection has been made at the Upazila headquarter since the sampling frame of Mouza having a particular crop is available at the Upazila level. These 100 upazilas have been used for all other 9 crops and the same Mouzas/EAs selected for minor crops such as oil seeds are taken as the sample Mouza/EAs. All the farm households with 0.05 acres of land growing these crops in the selected mouza/EA have been interviewed in the survey. The expected number of farm households that might have been interviewed for each of these crops is shown in Statement-I (see annexure- B).

2.2. Data Collection: its whole process

As data collection has a noteworthy impact on the quality of survey results, it is treated as a significant part of survey. Considering its importance, the following measures have been taken during the preparation of questionnaire as the tool of data collection:

- Brain-storming activity has been carried out by the members responsible for developing the questionnaire going to the field again and again in order to design a good questionnaire. They have thoroughly discussed most of the issues relating to the production and the cost of production of Boro with the farmer.
- Questionnaire has been pre-tested;

- Comprehensive manual of data collection with clearly defined concepts and definitions have been made;
- Training programme for the enumerators and supervisors has been conducted;
- Required number of enumerator in order to ensure smooth data collection has been set up;
- To take extra-care to the data collection activity, sufficient number of supervisors has been occupied.

2.2.1. Questionnaire Design:

A questionnaire is a powerful evaluation tool that allows the collection of data through the use of multi-dimensional questions. A questionnaire written without a clear goal and purpose is inevitably going to overlook important issues and waste enumerators' as well as respondents' time by asking and responding useless questions. All these matters have been tried to address to the extent possible in case of developing the questionnaire for this survey.

2.2.2. Process of questionnaire design

A sub-committee comprising of eight members- all from the different Wings of Bangladesh Bureau of Statistics (BBS) – have been formed in order to facilitate the questionnaire development activity. Project Director, Advisor and some other members of the sub-committee have paid several visits to the field with a view to being acknowledged what are the factors of production and the pros and cons of the whole process of the production of Boro as well. They discuss the matter with the farmers who grow Boro. After having the knowledge on the issue, they have placed the feedback to the meeting of the sub-committee. Sub-committee have thoroughly examined the feedback and selected the topics of the survey. Project Director and Advisor have been assigned to form a questionnaire on the selected topics and eventually, they have developed a questionnaire with seven questions. Subsequently the questionnaire has been brought forward to the Technical Committee, the highest statistical body, which has finally approved the questionnaire.

2.2.3. Pre-testing the questionnaire

The questionnaire has been pre-tested to examine the time necessitated to complete the interview, test the reliability i.e. whether it capture the information desired, and also investigate the consistency whether the information gathered by it is related to the whole purpose of the survey. The test has also been targeted to check the logistics required for successful operation of the survey.

In order to ensure the best performance of the questionnaire in respect of data collection, processing and analyzing, the pre-testing has been carried out almost two months before the survey at rural area of Tangail District and Savar- an Upzila belonging to Dhaka district. A group including Project Director, Advisor, some members of the sub-committee had gone to the mentioned two places to take part in testing the questionnaire. They have chosen some of the farmer at random as the respondent. The farmers have helped the team cordially and wanted to know whether they would be benefited in any way. However it was a very successful programme.

2.2.4. Findings of the Pre-test

Depending on the findings of the pretest, modifications to the questionnaire have been made in the structure and wording of the questionnaire. It has also taken care of semblance of the question, that is, the meaning and clarity which yields the intended information from the respondent. Furthermore, considerable amendment has also taken place in the enumerator's manual in view of ensuring proper questionnaire administration.

After pre-testing some significant suggestions from the respective team have been made, which had been eventually adopted properly in the final questionnaire. During the pre-test, it has been found that farmers, the respondents do not feel comfortable to respond to the questions relating to the total area of the land under Boro crop as they have cultivated it in many plots. Considering the fact, the structure of the questionnaire significantly changed. Deleting the aggregate area in a single row, the new concept, area by plot in seven rows has been incorporated.

2.2.5. Finalization of the Questionnaire

After addressing all the changes following the recommendations evolved from the pre-test, the questionnaire has been placed to the Technical Committee. The committee also put notable contribution to the questionnaire. Eventually, the questionnaire has been finalized by the approval of the Technical Committee.

2.2.6. Training of the Master Trainers (Division and Regional Coordinator) and Enumerators:

Training has been arranged in two phases in order to make the master trainers and enumerators perfectly conceptualized with the concepts and definitions of each word of the questionnaire as well as to convey the proper way of data collection. At the first stage, two days training programme conducted by the Project Director and Advisor has been arranged at the head office of BBS in Dhaka. At the first day the participants receive rigorous training on the concepts, definitions and the questionnaire and in the next day they have gone to the rural area of Savar Upzila with a view to having hands-on exercise on the questionnaire. In the second phase, enumerators have been trained for two days by the master trainers at the Regional Statistical Offices (RSOs) following the same sequence as the training arranged at the first phase. At first, enumerators receive training on the questionnaire and in the next day they also visit field at remote area of the respective region in order to have experience on hand. However, most of the trainees- both master trainers and enumerators- actively participated in the training and also made some suggestions which were subsequently taken into consideration.

2.2.7. Method of Data Collection: Face to face interview has been carried out following Paper and Pencil (PAPI) method.

2.2.8. Data Collection and Supervision: Data collection has been taken place during May 2009 at the homestead of the household. Usually the respondents are the head of household. The total of 100 enumerators, who are the employees of BBS and have proven experience in this field, have been engaged in data collection from the household and the total of 28 supervising officer named Regional Coordinators are responsible for supervising the data collection task. All supervising officers have been

directed to stay at the respective region during the period of data collection so that they can extensively supervise data collection task and address instantly any untoward problem arising during data collection. Three divisional coordinators including Project Director are also responsible to oversee all activities at field level relating to data collection. Furthermore, all possible measures have been taken to have a good quality of data.

2.2.9. Data Editing and Coding:

Data editing and coding are another vital phases of the survey, which is indispensable for data processing. It should be completed before data processing. In case of this survey coding has been done along with questionnaire development so that the enumerator can easily and accurately mark the right answers.

Data editing refers the activity of checking and cleaning data that have already been collected from the field. A group of experienced staff from Agriculture Wing under the supervision of two officers from the same wing have carried out the work of data editing with careful attention.

2.2.10. Data Processing:

Data processing involves many steps that are very important because it affects survey results very badly. During data processing following steps have been followed.

- ❖ Data entry
- ❖ Appending and Merging files
- ❖ Data validation (further checking, editing, and imputation)
- ❖ Final decision on errors
- ❖ Completion of data processing and generation of data files
- ❖ Final documentations
- ❖ Conversion of data files to another software.
- ❖ Storage of all files

Data Entry:

1. Software Used: Five software named CSPPro, Foxpro, Oracle (SQL), SPSS and Excel have been used for processing the survey data. CSPPro have been used for data entry, Foxpro also for editing, Oracle for tabulation, SPSS for data analysis and Excel for printing output.

2. Designing Data Entry Application: The first thing to do was to create the data dictionary based on the questionnaire. The data dictionary has consisted of ID items, records, items of the records, and also values of the items. Logic check has also maintained to avoid errors of inconsistency. After finishing the data dictionary, the data entry forms have been developed depending on data dictionary. After that, the data entry form are tested and, therefore, readily available for use.

3. Data capturing and Preliminary Validation

Just after the completion of data editing manually, data have been captured in computer. During data capturing, a variety of common errors have been identified. As a result data have been checked and cross checked with questionnaire depending on error message. During data processing, the appropriate corrective methodologies mentioned below have been used to ensure clean data.

- **Wrong data and out of range codes:** Firstly, the data collection instrument restricts the enumerator to a set of codes within the acceptable range for most of the questions. Secondly, the values have been set for avoiding wild codes for most of the questions. For example, the code for ownership of land has been set 1 to 5.
- **Inconsistency checking:** It has been done during designing the data entry program to avoid errors and inconsistency.
- **Treatment of Missing values:** The data entry program has been designed not to allow blanks that ensure not having missing values in the data.
- **Incomplete records and dropped cases.** The data entry program has designed to accept the complete data case; otherwise, it would not be saved. This has been set to avoid incomplete records and dropped cases.

- **Duplication of entries.** The data entry program has been designed in view of rejecting duplication of entries based on the identifiers.

4. Appending and Merging files: After data entry, files have properly been appended and merged in order to bring all data in a single file.

5. Data Validation: Validation has been accomplished after appending and merging files by checking the number of variables, the cases, wild codes, missing value and consistency. It has also done to make sure that the number of variables generated matched with the number of variables in the data set.

6. Final decision on errors: If there has been found any error during data validation, it is checked and rechecked; and sometimes it has been sent back to the survey authority to decide how it would be treated.

7. Completion of data processing and generation of data file: Addressing the final decision on error, data processing task have been completed and generated a data file which contains micro data.

8. Data preservation: After completion of processing, data have been stored in ASCII format. The data have also been converted to Microsoft Excel format in order to have the print out. Both original and new format have been preserved. The questionnaires have also filed for safe storage. A copy of the data set put forward to the survey authority for tabulation and analysis.

2.3 Tabulation:

Twelve tables focusing on the vital components such as total number of labours engaged in production of Boro, cost of land preparation, seeds used and their price, fertilizer used and their price, cost of insecticides, cost of production by phases etc. have been generated. All these tables have been given at the part of analysis and annexure.

2.4 Data Analysis:

Survey results have been analysed in tabular form. Major variable is explained vertically (columns) and cross tabulation by another related variable(s) horizontally. In the analysis, it has been described the variation of the magnitude of the major variables by division. Many aspects of production and the cost of production of jute have also been explained nationally.

2.5. Data Dissemination:

The final report has been disseminated both in electronic form and hard copy as book. Results are available in the website of BBS. Some data may also be published in other publications of BBS such as Statistical Year Book of Bangladesh, Year Book of Agriculture Statistics of Bangladesh, and Monthly Statistical Bulletin etc.

Chapter-III

Statistical Findings

Statistical Findings

This chapter deals with the factors of the cost of production of Boro crop. The factors addressed are (I) land tenureship such as own, share cropping, mortgage, lease and others. ii) labourers employed by phase such as land preparation, sowing, weeding, harvesting, and thrashing , iii) use of seeds, insecticides, fertilizers, plough, power tiller etc. iv) land leasing cost, v) production cost etc.

3.1 Boro growing households (HHs):

This survey has dealt with the total of 24625 household across the country, out of which 10999 HHs were involved in Boro cultivation. Table 3.1 shows that 44.67 percent of HH at national level cultivate Boro indicating that a big number of farmers grow Boro in Bangladesh. The reason might have been due to increasing demand for food. As the demand for food is increasing day by day the farmers have shifted cultivation from non-food crops to food crops. Within the period of 7 days it is not possible to collect data from more than 50 HHs growing Boro paddy in an enumeration areas (EAs) of 250 HHs. As such, field personal were advised to collect data from 50 HHs growing Boro by selection systematically for securing good response.

Table 3.1.Total number PSU, SSU, USU(HH) & number of household having Boro paddy

Division	Total Number						
	PSU	SSU	USU(HH)	HH having Boro	% of HH having Boro	HH actually enumerated	% of HH actually enumerated
Barisal	9	9	2250	531	23.60	302	13.42
Chittagang	16	16	3625	1091	30.10	575	15.86
Dhaka	25	25	6250	2982	47.71	1198	19.17
Khulna	16	16	4000	2035	50.87	753	18.83
Rajshahi	28	28	7000	3703	52.90	1225	17.50
Sylhet	6	6	1500	657	43.80	289	19.27
Bangladesh	100	100	24625	10999	44.67	4342	17.63

Distribution of sample and percentage of households growing Boro by division is shown in the table 3.1. It is observed that in Barisal the lowest percentage of HHs, only 23.60% cultivates Boro and the highest, 52.90 percent in Sylhet. It is also mentionable that a good proportion of the HHs in two divisions, Khulna (50.87%), and

Dhaka (47.71%) cultivate Boro, which are higher than the national percentage (44.67%). The table reveals that Boro paddy is now almost evenly grown across the country.

Percentage of HH growing Boro paddy actually enumerated in the country was 17.63%. It ranges from 13.42% in Barisal to 19.27% in Sylhet and the table gives the picture of almost even distribution of HHs growing Boro paddy actually enumerated.

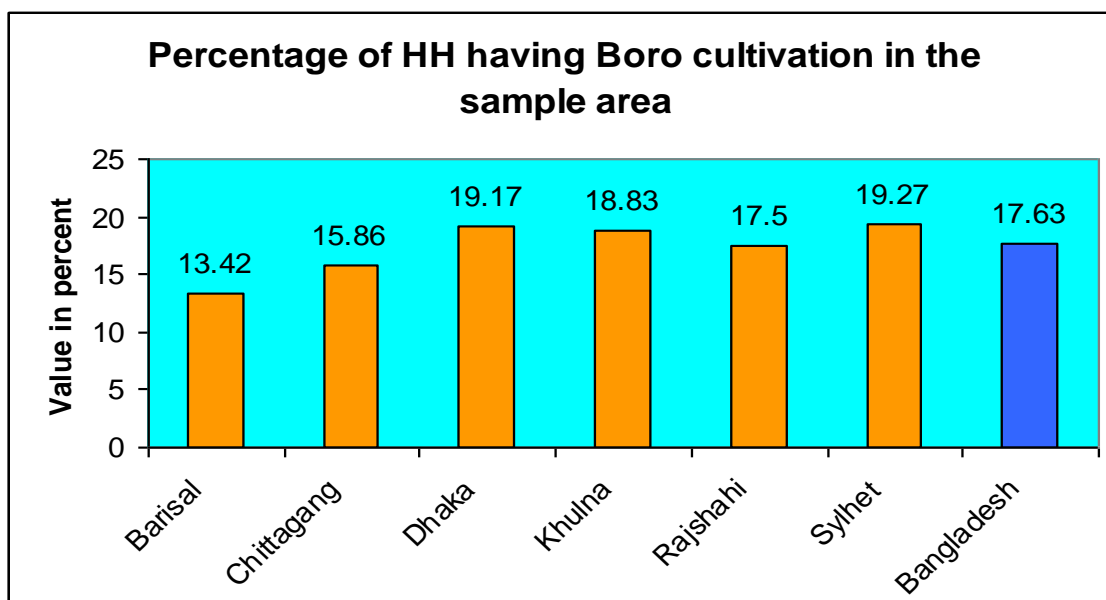


Figure 1: Percentage of HH having Boro cultivation in the sample area.

3.2 Sample area under Boro crop.

Table 3.2. Total area under Boro crop and its percentage in the sample area by variety and by division

Division	Local Boro		HYV Boro		Hybrid Boro		Combined Boro	
	Area	%	Area	%	Area	%	Area	%
Barisal	5	3.33	115	80.76	23	15.91	143	100.00
Chittagang	13	3.48	297	81.50	55	15.01	364	100.00
Dhaka	29	2.90	803	79.86	173	17.24	1005	100.00
Khulna	13	2.50	420	81.56	82	15.94	515	100.00
Rajshahi	19	1.82	804	78.61	200	19.58	1022	100.00
Sylhet	25	7.28	263	77.75	51	14.97	338	100.00
Bangladesh	103	3.03	2701	79.74	583	17.23	3387	100.00

Production cost survey for Boro crop was carried out in June, 2009. In this survey, data on area under Boro paddy, land tenure, leasing, means of land preparation, seed and seedling cost, quantity and cost of fertilizer used, insecticides cost, sowing/plantation, weeding, harvesting, thrashing and other related cost were collected. Moreover, per acre production cost as well as per kilogram production cost were computed. It is observed from table 3.2 that areas under Boro crop were 3.03%, 79.74%, and 17.23% for local, HYV, and hybrid respectively. As per BBS estimate (2008-2009) Local Boro 2.59% , HYV Boro 80.16% and Hybrid Boro 17.25%. In respect of area under the crop in terms of percentage the survey data is very close to BBS estimate. It is to be noted here that area under local Boro is not significant in Bangladesh. In cultivation of Boro crop, in the sample area Rajshahi and Dhaka divisions cover larger area of 1022 acres and 1005 acres respectively compared to other divisions.

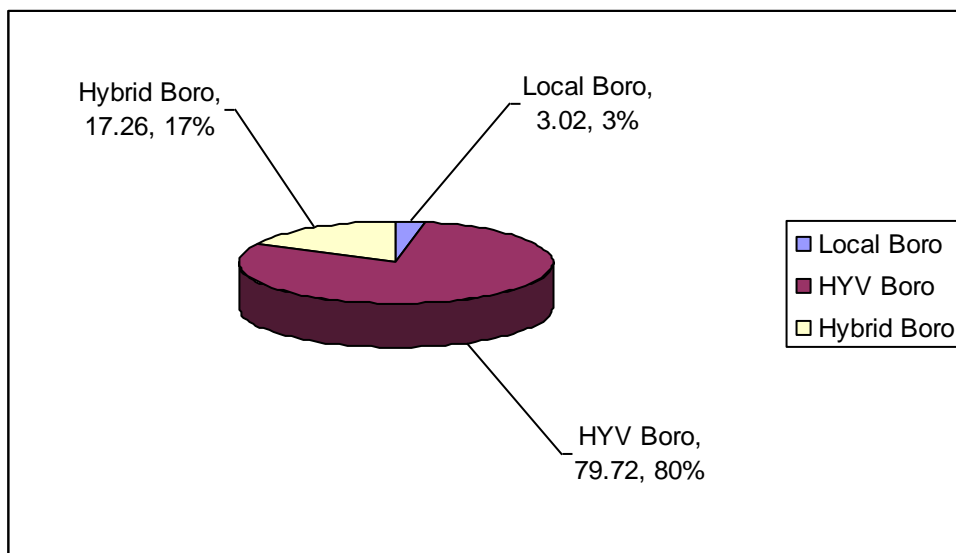


Figure2: reveals that HYV and Hybrid Boro covers 97% of total area under Boro crop while a little over 3% is planted under local Boro.

3.3. Land tenure:

Area under Boro crop by type of land tenureship in percentage are shown below:

Table 3.3(a). Percentage of area under Local Boro by land tenureship.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
Barisal	62.50	0.00	0.00	37.50	0.00	100.00
Chittagang	67.44	13.95	2.33	16.28	0.00	100.00
Dhaka	62.50	14.77	20.46	1.14	1.14	100.00
Khulna	76.67	16.67	0.00	3.33	3.33	100.00
Rajshahi	81.58	10.53	2.63	5.26	0.00	100.00
Sylhet	86.00	6.00	4.00	4.00	0.00	100.00
Bangladesh	72.37	12.06	8.56	6.23	0.78	100.00

In Bangladesh, it is observed that 72.37% of local Boro crop land is cultivated by owner himself/herself followed far behind by share cropping (12.03%). In Dhaka division leasing system is insignificant while a significant portion of Boro land is cultivated by mortgage system (20.46%). On the other hand, Barishal division experiences no share cropping, mortgage and leasing system. Also Khulna division shows no mortgage system. In Barisal division leasing system is found to be 37.50% which is quite high.

Table 3.3(b). Percentage of area under HYV Boro by land tenureship.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
Barisal	49.47	12.37	7.11	31.05	0.00	100.00
Chittagang	46.50	24.29	4.27	24.73	0.22	100.00
Dhaka	67.31	17.29	11.86	2.61	0.93	100.00
Khulna	72.56	12.47	9.02	4.28	1.67	100.00
Rajshahi	73.89	13.82	5.29	4.90	2.11	100.00
Sylhet	70.97	22.20	6.07	0.19	0.57	100.00
Bangladesh	66.65	16.59	8.00	7.56	1.20	100.00

Area under HYV Boro by land tenure is shown in table 3.3(b). For HYV cultivation, it is seen that 66.65% of Boro crop land is cultivated by owner himself/herself while 16.59% by share cropping. In Barisal division, the percentage of land under mortgage is lower compared to share cropping and leasing system. Barisal division experiences no other system. Leasing system is found to be high in places of Barisal (31.05%) and Chittagong (24.73%) divisions. A significant portion of land under Boro is found in Chittagong (24.29%) and Sylhet (22.20%) in crop sharing system. Under mortgage system Dhaka division registers 11.86% which is quite higher than national figure(8%).

Table 3.3(c). Percentage of area under Hybrid Boro by land tenureship.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
Barisal	52.11	11.27	7.04	29.58	0.00	100.00
Chittagang	46.06	25.46	4.24	23.64	0.61	100.00
Dhaka	65.76	19.15	10.25	3.29	1.55	100.00
Khulna	88.98	4.72	3.94	2.36	0.00	100.00
Rajshahi	78.37	8.35	4.74	7.59	0.95	100.00
Sylhet	67.42	21.35	8.99	2.25	0.00	100.00
Bangladesh	69.45	14.57	6.89	8.16	0.94	100.00

Area under hybrid Boro by land tenure is exhibited in table 3.2(c). For hybrid cultivation, it is seen that 69.45% of Boro crop land is cultivated by owner himself/herself followed by crop share(14.57%), leasing(8.16%) and mortgage(6.89%) system. Almost 90% hybrid Boro land in Khulna division is cultivated by owner. An insignificant portion of share cropping, mortgage and leasing system exist here. It is also seen that owner system is dominant in all divisions. The percentage of crop share system in Chittagong, Sylhet and Dhaka division are 25.46%, 21.35% and 19.15% respectively which are substantially high. Leasing system for the cultivation of Hybrid Boro shows also high trend in tracts of Barisal and Chittagong divisions.

Table 3.3(d). Percentage of area under Combined Boro by land tenureship.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
Barisal	50.11	11.98	6.97	30.94	0.00	100.00
Chittagang	47.24	24.06	4.19	24.24	0.27	100.00
Dhaka	66.90	17.54	11.84	2.68	1.04	100.00
Khulna	74.35	11.77	8.28	4.06	1.54	100.00
Rajshahi	74.90	12.66	5.14	5.45	1.84	100.00
Sylhet	71.62	20.87	6.31	0.75	0.45	100.00
Bangladesh	67.28	16.12	7.83	7.62	1.15	100.00

Table 3.3(d) shows the percentage of area under combined Boro by land tenure. It is observed that 67.28% of households grow Boro paddy are grow under own land system followed by 16.12% share cropping, 7.83% mortgage, 7.62% lease and 1.15% others. Type of tenure for the cultivation of Boro crop in Bangladesh exposes that two thirds of farmers cultivate Boro crop in there own lands. On the other hand approximately 50%

of Boro in Barisal and Chittagong are grown in own land system. The table exhibits that under own land system Dhaka, Khulna, Rajshahi and Sylhet registers 66.90%, 74.35%, 74.90% and 71.62% respectively. Under crop sharing system 24.06% is recorded in Chittagong followed by Sylhet (20.87%). 11.84% farmers in Dhaka division grow the crop through mortgage system. The figures shown in the table expose that in case of leasing Barisal division registered the highest 30.94% followed by Chittagong 24.24%. Land tenure headed by others is found to be very low in all divisions.

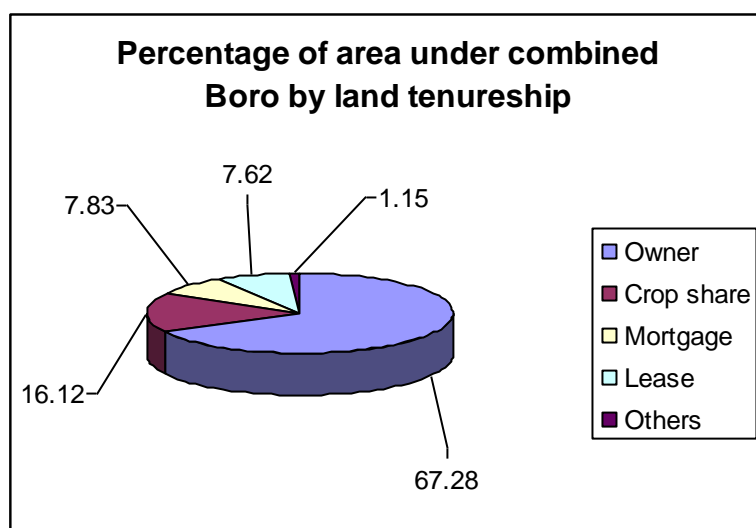


Figure : 3 displays by category of land tenurship of combined Boro crop.

3.4. Leasing:

Leasing means the land taken by the household for the cultivation of Boro paddy only on payment of money to the land owner. Leasing value per acre is found to be significantly different across divisions and varieties. Local leasing value has also been recorded in case of households who cultivated the crop in their own lands.

Table 3.4. Per acre leasing cost by division and by varieties of Boro paddy

(Fig. in Tk.)

Division	Local Boro	HYV Boro	Hybrid Boro	Combined Boro
Barisal	2694	3220	3892	3314
Chittagang	3116	3673	4272	3758
Dhaka	2869	4320	3880	4148
Khulna	2895	3672	4032	3718
Rajshahi	3067	3647	4252	3806
Sylhet	2854	3520	4032	3558
Bangladesh	2906	3639	4071	3717

The average per acre leasing cost for Boro crop in Bangladesh is found Tk. 3717. The costs are Tk. 2906, Tk. 3639, and Tk. 4071 for local, HYV and hybrid Boro respectively. There is such variation for leasing costs between Local, HYV and hybrid Boro. Per acre leasing cost in Chittagong division for local Boro is the highest of Tk 3116. The highest leasing value of Tk 4320 for HYV Boro is recorded in Dhaka division. In case of Hybrid Boro leasing cost occupies the maximum of Tk 4272 in chittagong division followed by Rajshahi Tk4252 and Sylhet Tk 4032. For combined Boro leasing cost in Dhaka division ranks the first position (Tk 4148).

3.5 Land preparation:

Before sowing/planting of seeds/seedlings land has to be prepared by tilling. Generally land is tilled by local plough or power tiller. Presently in our country land is tilled mostly by power tillers. Expenditure per acre (in Tk.) involved in land preparation is shown in table 3.5.

Table 3.5. Per acre land preparation cost by division and by varieties of Boro paddy.

(Fig. in Tk.)

Division	Local Boro	HYV Boro	Hybrid Boro	Combined Boro
Barisal	1200	1917	1937	1897
Chittagang	1333	1918	1926	1899
Dhaka	1356	1960	1953	1942
Khulna	1474	1890	1807	1867
Rajshahi	1398	1842	1831	1832
Sylhet	1237	1899	1925	1854
Bangladesh	1340	1902	1885	1882

The average per acre land preparation cost for combined Boro crop in Bangladesh is recorded at Tk. 1882 and divisional variation in the cost is very negligible. Barisal, Chittagong and Dhaka divisions spent more than average cost on land preparation compared to other three divisions. At national level it is observed that land preparation cost is higher in HYV Boro compared to other varieties.

Table 3.5(a). Per acre land preparation cost for local Boro paddy by division and by type of cultivation.

(Figures in Tk.)

Division	Plough	Power tiller	Others	Total
	Tk.	Tk.	Tk.	Tk.
Barisal	0	1158	42	1200
Chittagang	238	885	209	1333
Dhaka	0	1192	164	1356
Khulna	229	1014	231	1474
Rajshahi	110	1081	207	1398
Sylhet	117	1016	104	1237
Bangladesh	106	1068	166	1340

It is apparent from the table 3.5(a) that the average per acre land preparation cost for local Boro crop in Bangladesh is recorded at Tk. 1340. Barisal, Chittagong and Sylhet divisions spent less than average cost on land preparation compared to other three divisions. A larger portion of expenditure for land preparation goes to the mechanized power tiller (about 80%) in all the divisions. For Chittagong and Khulna divisions, it is found that a significant percent of land under Boro paddy is prepared by plough.

Table 3.5(b). Per acre land preparation cost for HYV Boro paddy by division and by type of cultivation

(Figures in Tk.)

Division	Plough	Power tiller	Others	Total
	Tk.	Tk.	Tk.	Tk.
Barisal	71	1725	122	1917
Chittagang	328	1342	247	1918
Dhaka	35	1731	194	1960
Khulna	337	1305	249	1890
Rajshahi	295	1339	207	1842
Sylhet	448	1199	252	1899
Bangladesh	233	1453	215	1902

It is observed from the table 3.5(b) that the average per acre land preparation cost for HYV Boro crop in Bangladesh is Tk. 1902. Divisional variation in the cost is very low. All divisions are still dependent on traditional plough system except Barisal.

Tble 3.5(c). Per acre land preparation cost for Hybrid Boro paddy by division and by type of cultivation

(Figures in Tk.)

Division	Plough	Power tiller	Others	Total
	Tk.	Tk.	Tk.	Tk.
Barisal	62	1759	117	1937
Chittagang	339	1344	243	1926
Dhaka	20	1725	208	1953
Khulna	140	1367	299	1807
Rajshahi	254	1334	243	1831
Sylhet	388	1182	355	1925
Bangladesh	181	1459	245	1885

It is observed from table 3.5(c) that the average per acre land preparation cost for hybrid Boro crop in Bangladesh is Tk. 1885 and the cost varies negligibly between divisions. 77.4% of the land under hybrid Boro is cultivated by the mechanized power tiller and the share of plough is 9.60%.

Table 3.5(d) Per acre land preparation cost for combined Boro paddy by division and by type of cultivation

(Figures in Tk.)

Division	Plough	Power tiller	Others	Total
	Tk.	Tk.	Tk.	Tk.
Barisal	67	1711	118	1897
Chittagang	327	1327	245	1899
Dhaka	32	1714	195	1942
Khulna	303	1307	256	1867
Rajshahi	284	1333	214	1832
Sylhet	415	1183	256	1854
Bangladesh	221	1443	219	1882

It is observed from table 3.5(d) that the average per acre land preparation cost for combined Boro crop in Bangladesh is Tk. 1882 and variation in the cost by division is negligible. Barisal, Chittagong and Dhaka divisions spent more than average cost on land preparation compared to other three divisions. A larger portion of expenditure for land preparation goes to the mechanized power tiller(76.7%) in all the divisions. Nearly 12% of the cost is incurred by ploughing. ‘Others’ means sometimes farmers prepare lands by spades.

3.6 Seeds:

Table 3.6(a). Seed requirements (kg) and cost (Tk) for per acre plantation of Boro by division and by varieties.

Division	Local Boro		HYV Boro		Hybrid Boro		Combined Boro	
	KG	Tk	KG	Tk	KG	Tk	KG	Tk
Barisal	36.77	720	15.64	391	10.49	1009	16.31	476
Chittagang	23.04	470	14.75	369	13.36	1246	15.19	442
Dhaka	25.61	516	17.75	444	11.55	1096	17.89	489
Khulna	27.02	551	13.39	335	9.31	999	13.40	442
Rajshahi	29.08	585	18.37	459	9.58	899	18.13	490
Sylhet	23.09	462	15.68	368	13.66	1145	16.59	404
Bangladesh	26.02	524	16.66	414	10.48	1024	16.70	467

Per acre seed cost by variety by division of Boro crop are presented by table 3.6. The average seed requirement for per acre plantation is found 16.70 kilogram which cost Tk. 467. Seed requirement for per acre plantation of local Boro (26.02 kg) is higher than that of HYV(16.66 kg) and hybrid (10.48kg) varieties. It is apparent in the table that Hybrid Boro seeds are needed in less quantity; but its value per kg is remarkably higher.

Table 3.6(b). Purchasing cost , other cost of seedling for one acre plantation and selling of seedlings

(Fig. in Tk.)

Division	Local Boro			HYV Boro			Hybrid Boro			Combined Boro		
	Purchase cost	Others cost	Selling of seedling	Purchase cost	Others cost	Selling of seedling	Purchase cost	Others cost	Selling of seedling	Purchase cost	Others cost	Selling of seedling
Barisal	745	206	0	358	156	78	272	61	0	394	149	65
Chittagang	787	316	214	311	184	184	270	176	287	339	192	194
Dhaka	661	355	170	307	179	185	389	207	181	336	192	184
Khulna	263	345	160	288	180	64	265	30	51	284	166	67
Rajshahi	626	256	174	282	116	95	482	63	10	304	116	92
Sylhet	705	338	0	324	196	10	495	420	119	419	221	12
Bangladesh	611	322	131	299	158	114	356	105	91	326	163	113

Table 3.6(b) shows per acre purchasing cost , other cost of seedling and selling of seedlings. In case of need farmers purchase seedling from others .At national level , purchasing cost of seedlings for one acre plantation is Tk 326 and its other cost is Tk.163. Others means the caring costs of seedlings. Some times additional seedlings are sold locally by the farmers and in this case Tk.113 for per acre was recorded at national level.

3.7 Fertilizer:

Table 3.7(a). Per acre qty. of fertilizer used (Kg) and price (Tk) for local Boro by division

(Fig. in Tk.)

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others	Total
	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk		
Barisal	40.76	507	17.65	769	4.41	199	0.21	25	0.42	10	0.00	0	21	1531
Chittagang	54.26	775	20.58	840	8.75	420	0.16	16	3.08	34	224.76	253	92	2429
Dhaka	53.37	657	21.80	946	10.33	476	0.31	31	9.18	64	42.50	53	40	2267
Khulna	53.81	658	20.58	886	14.50	661	1.87	162	14.00	99	155.52	156	145	2766
Rajshahi	56.12	695	18.70	830	11.10	540	0.23	23	4.77	31	283.75	315	347	2781
Sylhet	38.58	464	21.56	929	6.78	305	0.00	0	0.00	0	0.00	0	0	1699
Bangladesh	50.36	632	20.67	891	9.79	456	0.41	38	5.90	43	113.77	126	107	2293

In Bangladesh, per acre average requirement of urea, TSP, MOP, zinc, gypsum and organic for local Boro are 50.36, 20.67, 9.79, 0.41, 5.90 and 113.77 kilograms respectively. No zinc, gypsum and organic fertilizer are used for local Boro in Sylhet division. It is also seen that in Barisal, organic fertilizer is not used. Table 3.7(a) also shows that per acre price of fertilizer used for local Boro by division. In Bangladesh, the average per acre price of fertilizer for local Boro stands at Tk 2293. Rajshahi division spends more on urea among divisions and also Rajshahi division makes higher expenditure for organic. Zinc and gypsum are used almost in all divisions except Sylhet. Here it is to be mentioned that among seven categories of fertilizers only three categories are present in Sylhet.

Table 3.7(b). Per acre qty. of fertilizer used (Kg) and price (Tk) for HYV Boro by division

(Fig. in Tk.)

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others	Total
	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk		
Barisal	75.52	929	27.13	1152	11.95	539	1.21	98	0.98	36	14.18	14	36	2804
Chittagang	87.73	1129	25.94	1127	9.20	428	0.41	38	2.68	42	222.92	251	108	3122
Dhaka	89.97	1251	26.14	1137	11.64	541	0.46	49	8.32	67	54.15	68	35	3147
Khulna	89.08	1282	27.05	1187	8.09	537	1.19	113	16.31	122	137.26	146	156	3543
Rajshahi	87.79	1097	22.65	958	16.47	761	0.82	80	11.39	88	429.31	443	269	3695
Sylhet	67.47	876	20.96	914	12.89	582	0.02	2	0.00	0	62.94	115	5	2493
Bangladesh	86.15	1145	24.73	1067	12.45	600	0.67	65	8.80	71	201.43	219	132	3300

It is observed that per acre highest quantity of organic fertilizer used for HYV Boro in Bangladesh is found to be 201.43 kilogram. As high as 429.31 kilogram organic fertilizer is used for per acre HYV Boro cultivation in Rajshahi division. In Sylhet there is no use of gypsum. It is also seen from the table 3.7(b) that the average price of fertilizer for HYV Boro is found to be Tk 3300 in Bangladesh. Maximum Tk. 3695 is spent for fertilizer in Rajshahi division followed by (Tk 3543). Some variation in the price of fertilizers costs among six divisions. On the other hand, per acre use of Mop ranges from 8.09 kg in Khulna to 16.47 kg in Rajshahi division.

Table 3.7(c). Per acre qty. of fertilizer used (Kg) and price (Tk) for Hybrid Boro by division

(Fig. in Tk.)

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others	Total
	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk		
Barisal	69.65	852	33.76	1393	12.87	579	1.14	108	1.51	23	17.75	18	25	2998
Chittagang	81.46	1052	26.09	1125	16.76	767	0.70	56	2.87	30	273.61	301	125	3455
Dhaka	96.87	1222	29.90	1441	11.99	560	2.33	221	14.26	143	92.44	101	48	3737
Khulna	84.00	1079	23.01	985	13.23	635	1.25	102	10.43	103	88.45	93	70	3066
Rajshahi	86.83	1079	22.04	951	17.30	793	0.56	62	11.69	132	609.34	641	226	3883
Sylhet	76.52	990	25.33	1102	12.17	547	0.10	12	0.00	0	46.93	90	5	2747
Bangladesh	87.32	1102	25.59	1146	14.51	671	1.17	111	10.04	106	282.31	303	116	3554

It is seen from table 3.7(c) that per acre average requirement of urea, TSP, MOP, zinc, gypsum and organic for hybrid Boro in Bangladesh are 87.32, 25.59, 14.51, 1.17, 10.04 and 282.31 kilograms respectively. Survey data shows that farmers/cultivators do not use gypsum for hybrid Boro in Sylhet division. Table 3.7(c) shows the value of fertilizer per acre for Hybrid Boro by division. In Bangladesh Tk. 3554, on an average, is spent against fertilizer for per acre hybrid Boro cultivation. It is observed that the highest Tk. 3883 is spent for fertilizer in Rajshahi division while the lowest (Tk 2747) in Sylhet division for hybrid Boro. Remarkable use of organic fertilizer is recorded in places of Rajshahi division (Qty 609.34 kg and price Tk 641). Farmers in Chittagong division also used more organic fertilizer 273.61 kg for one acre plantation.

Table 3.7(d). Per acre qty. of fertilizer used (Kg) and price (Tk) for Combined Boro by division

(Fig. in Tk.)

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others Value (Tk)	Total Value (Tk)
	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	Value Tk		
Barisal	73.42	903	27.87	1177	11.84	534	1.17	97	1.05	33	14.27	14	34	2792
Chittagang	85.62	1105	25.78	1116	10.33	478	0.45	40	2.72	40	230.63	258	110	3148
Dhaka	90.08	1228	26.67	1185	11.66	542	0.78	79	9.39	80	60.55	73	37	3224
Khulna	87.38	1234	26.24	1147	9.07	556	1.22	112	15.32	118	129.93	138	142	3447
Rajshahi	87.08	1087	22.47	954	16.54	763	0.76	75	11.34	95	461.55	479	262	3716
Sylhet	67.07	868	21.67	944	12.40	559	0.03	3	0.00	0	56.60	104	4	2483
Bangladesh	85.32	1123	24.76	1076	12.73	608	0.75	72	8.93	77	212.90	231	128	3315

It is observed from the table 3.7(d) that in Bangladesh, per acre average requirements of urea, TSP, MOP, zinc, gypsum and organic are 85.32, 24.76, 12.73, 0.75, 8.93 and 212.90 kilograms respectively. No gypsum users are found for combined Boro in Sylhet division.

It is seen from table 3.7(d) that in Bangladesh, per acre average cost for fertilizer is registered at Tk 3315. Most of the expenditure are incurred to urea, TSP and MOP. In terms of cost zinc, gypsum and organic fertilizers seem to be less expensive and less important in Boro cultivation.

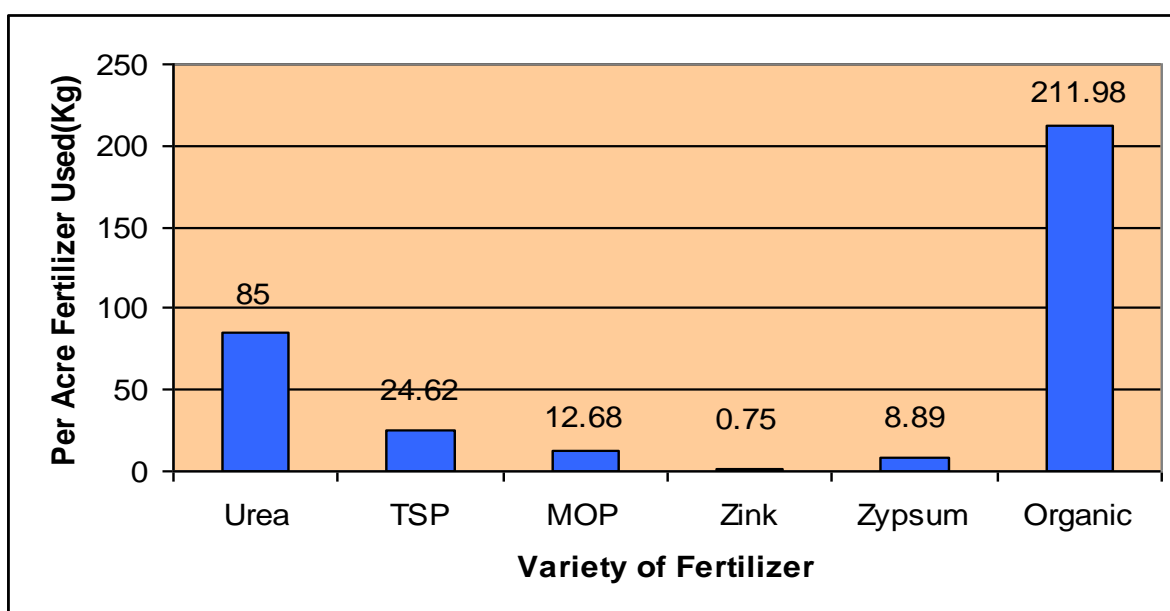


Figure 4. Per acre fertilizer used (Kg.) by variety in Bangladesh

Figure 4 displays that urea and organic fertilizers are used in large quantities for per acre Boro cultivation. It shows that use of TSP is two times higher than that of MOP.

3.8 Insecticides/pesticides and others cost.

Table 3.8(a). Per acre cost of insecticides/pesticides and others for local Boro by division (Fig. in Tk.)

Division	Insecticides/pesticides	Others	Total
Barisal	493	254	748
Chittagang	562	104	666
Dhaka	421	123	545
Khulna	464	211	675
Rajshahi	477	133	610
Sylhet	343	0	343
Bangladesh	443	111	555

It is observed that per acre average insecticide/pesticides cost for local Boro stands at Tk 443. Other cost is Tk 111. This can be seen in table 3.8(a). Total expences for this purpose stands at Tk 555 and it varies from Tk343 in Sylhet division to Tk 748 in Barisal division.

Table 3.8(b). Per acre cost of insecticides/pesticides and others for HYV Boro by division
(Fig. in Tk.)

Division	Insecticides/pesticides	Others	Total
Barisal	499	281	781
Chittagang	600	73	673
Dhaka	427	98	525
Khulna	403	238	641
Rajshahi	479	151	630
Sylhet	234	36	270
Bangladesh	448	142	591

It is seen that Tk 448 is spent for insecticides/pesticides in case of HYV Boro cultivation in Bangladesh. The highest cost of (Tk 600) in Chittagong division followed by Barisal (Tk 499) is displayed in table 3.8(b). On the other hand, the maximum total expenditure (Tk 781) is observed in Barisal division and the minimum (Tk 270) in Sylhet division and at national level it is Tk 591.

Table 3.8(c). Per acre cost of insecticides/pesticides and others by division of hybrid Boro paddy.

(Fig. in Tk.)

Division	Insecticides/pesticides	Others	Total
Barisal	757	233	990
Chittagang	621	65	685
Dhaka	400	132	532
Khulna	776	154	930
Rajshahi	441	180	622
Sylhet	249	38	287
Bangladesh	509	145	654

Table 3.8(c) depicts that per acre cost is Tk 509 for insecticides in Hybrid Boro cultivation. It is observed that Tk 145 is spent for other cost. The highest total cost of (Tk 990) observed in Barisal division and the lowest cost of Tk 287 is in Sylhet division and national average is Tk 654.

Table 3.8(d). Per acre cost of insecticides/pesticides cost and others by division of combined Boro paddy

(Fig. in Tk.)

Division	Insecticides/pesticides	Others	Total
Barisal	542	273	815
Chittagang	601	73	674
Dhaka	422	105	527
Khulna	465	224	689
Rajshahi	472	156	628
Sylhet	245	33	278
Bangladesh	458	142	600

It is observed from table 3.8(d) that per acre average insecticides/pesticides cost for Boro paddy stands at Tk 458 while it is Tk 142 for other cost. It is to be noted here that the lowest insecticides/pesticides cost is recorded in Sylhet division (Tk 245) and the highest is in Chittagang division (Tk 601). 'Others' means the wages of labourers engaged for the application of insecticides/pesticides. Total expenditure for this purpose is found to be maximum (Tk 815) in Barisal division and minimum (Tk 278) in Sylhet division. Sylhet division might be less attacked by insects/pests. The average total cost at national level is Tk 600.

3.9 Irrigation:

Irrigation is the most important input for growing paddy plants. In the first part of the crop season weather remains dry and at the growing stage of the plants seldom rain fall occurs. So, surface or under ground water is applied to the paddy plants by mechanical system which are run by electricity or diesel. Irrigation cost by varieties are shown below:

Table 3.9(a). Per acre cost of irrigation and others by division of local Boro paddy

(Fig. in Tk.)

Division	Irrigation							Others	Total
	Electricity			Diesel					
	Own	Instead of paddy	Instead of money	Own	Instead of paddy	Instead of money			
Barisal	0	0	1062	0	531	2132	442	4168	
Chittagang	458	0	1052	213	164	2194	401	4482	
Dhaka	141	320	1003	297	662	1250	334	4006	
Khulna	398	78	156	183	503	1941	741	3999	
Rajshahi	354	324	1160	233	756	524	375	3726	
Sylhet	0	0	0	265	177	2161	210	2812	
Bangladesh	226	170	715	244	486	1556	386	3784	

Table 3.9(a) shows that per acre total cost for irrigation for local Boro is Tk 3784. Minimum cost is in Sylhet (Tk 2812) and maximum in Chittagong (Tk 4482).

Table 3.9(b) Per acre cost of irrigation and others by division of HYV Boro paddy
(Fig. in Tk.)

Division	Irrigation							Others	Total
	Electricity			Diesel					
	Own	Instead of paddy	Instead of money	Own	Instead of paddy	Instead of money			
Barisal	0	12	1669	194	1544	2785	60	6265	
Chittagang	271	5	1592	594	0	3651	537	6651	
Dhaka	465	750	1693	2863	1515	1235	242	8764	
Khulna	645	290	386	4783	1076	3101	309	10591	
Rajshahi	609	673	1270	3483	653	2478	534	9699	
Sylhet	962	695	630	102	115	2861	55	5419	
Bangladesh	542	532	1244	2738	880	2406	352	8694	

It is seen in table 3.12(b) that per acre total irrigation cost at national level for HYV Boro is Tk 8694 and it ranges from Tk 5419 in Sylhet to Tk 10591 in Khulna division.

Table 3.9(c). Per acre cost of irrigation and others by division of hybrid boro paddy
(Fig. in Tk.)

Division	Irrigation							Others	Total
	Electricity			Diesel					
	Own	Instead of paddy	Instead of money	Own	Instead of paddy	Instead of money			
Barisal	0	0	2042	684	2321	10481	52	15581	
Chittagang	368	0	2919	795	0	9185	481	13748	
Dhaka	435	1331	4083	2312	3231	2831	204	14426	
Khulna	1170	0	0	841	1086	9071	121	12288	
Rajshahi	1505	315	4174	2924	627	3362	712	13618	
Sylhet	429	2833	1352	867	309	7523	30	13344	
Bangladesh	895	722	3105	1985	1412	5225	377	13722	

Table 3.9(c) focuses that per acre total cost for irrigation for Hybrid Boro is recorded Tk 13722. The highest amount (Tk 15581) is seen in Barisal and the lowest (Tk 12288) in khulna. In other four divisions less variation is found in respect of total cost.

Table 3.9(d). Per acre cost of irrigation and others by division of combined boro paddy
(Fig. in Tk.)

Division	Irrigation						Others	Total
	Electricity			Diesel				
	Own	Instead of paddy	Instead of money	Own	Instead of paddy	Instead of money		
Barisal	0	10	1719	270	1653	4012	65	7728
Chittagang	292	4	1773	612	6	4434	524	7645
Dhaka	450	837	2084	2690	1785	1510	238	9594
Khulna	723	239	318	4036	1063	4028	290	10697
Rajshahi	777	599	1827	3325	649	2618	566	10362
Sylhet	824	979	703	229	148	3531	60	6473
Bangladesh	594	555	1550	2540	961	2868	357	9425

Table 3.9(d) reflects that per acre total expenses of irrigation for combined Boro is Tk 9425 at national level. It varies from Tk 6473 in Rajshahi division to Tk10697 in Khulna division. Here ‘other’ means the wages of additional labourers engaged for irrigation purpose. If the figures are analyzed, it is found that proportion of irrigation cost per acre by diesel is almost double than that of electricity and it means that farmers are dependent on diesel and irrigation is mostly done by diesel.

3.10 Labourer:

Table 3.10(a). No. of labour engaged and cost incurred (Tk) for seed-bed preparation for one acre plantation by division and by varieties of Boro paddy.

(Fig. in no.)

Division	Local Boro		HYV Boro		Hybrid		Combined Boro	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	5.88	1228	2.42	434	2.95	405	2.68	476
Chittagang	3.25	741	2.59	534	2.71	678	2.64	558
Dhaka	4.11	716	3.90	744	3.48	555	3.89	731
Khulna	3.39	679	3.10	546	3.93	444	3.24	537
Rajshahi	4.30	755	2.67	463	2.54	422	2.70	468
Sylhet	2.88	510	2.63	442	3.17	539	2.68	454
Bangladesh	3.74	700	3.02	551	3.25	486	3.08	554

It is seen from the table that the average number of labourers required for seed-bed preparation for per acre plantation at national level is 3.08 and their cost is recorded at Tk. 554. Number of labourer required in Dhaka division is the highest 3.89 followed by Khulna 3.24, Rajshahi 2.70 and the lowest 2.64 in Chittagong division. No significant

variations is observed in number of labourer among the varieties. But variation exists between divisions.

Table-3.10(b). No. of labour employed and cost (Tk) incurred for plucking of seedlings for one acre plantation by division and by variety of Boro paddy.

(Fig. in no.)

Division	Local Boro		HYV Boro		Hybrid boro		Combined Boro	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	4.41	767	3.32	569	3.63	626	3.42	586
Chittagang	4.06	673	2.96	515	3.81	635	3.10	535
Dhaka	4.14	544	3.86	632	3.66	620	3.87	626
Khulna	4.41	635	3.79	638	3.61	612	3.80	634
Rajshahi	2.96	425	3.54	593	3.01	499	3.49	583
Sylhet	2.75	421	2.74	457	2.57	438	2.73	452
Bangladesh	3.69	538	3.52	589	3.45	580	3.52	585

Number of labour engaged and cost incurred for plucking of seedlings for one acre plantation are exhibited in table 3.10(b). It is seen from the table that the average number of labourers required for plucking of seedlings at national level is 3.52 and their cost is recorded at Tk. 585. It is also observed that there is no significant variation of labourers engaged among the divisions except Sylhet. Similarly no significant variation is observed in number of labourers engaged by variety.

Table-3.10(c). Per acre no. of labour engaged and cost of sowing of seeds/planting of seedlings by division and by variety of Boro paddy

Division	Local Boro		HYV Boro		Hybrid		Combined Boro	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	5.46	1124	11.02	1921	11.21	2016	10.86	1909
Chittagang	10.16	1733	11.69	2039	11.71	2071	11.64	2033
Dhaka	9.62	1386	11.19	1709	11.32	1796	11.16	1715
Khulna	9.57	1276	12.11	1677	12.92	1819	12.18	1690
Rajshahi	9.28	1266	11.22	1554	11.91	1787	11.32	1594
Sylhet	10.88	1670	10.35	1558	11.29	1752	10.53	1595
Bangladesh	9.69	1444	11.31	1687	11.78	1827	11.34	1704

The average number of labourers required for per acre sowing/planting at national level is 11.34 and their cost is recorded at Tk. 1704. There is no significant difference for cost of labour between HYV and Hybrid varieties.

Table-3.10(d). Per acre no. of labour engaged and cost of weeding by division and by variety of Boro paddy.

Division	Local Boro		HYV Boro		Hybrid		Combined Boro	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	7.98	1176	9.49	1506	10.59	1588	9.62	1508
Chittagang	10.40	1528	12.68	2085	12.48	2084	12.57	2066
Dhaka	10.89	1490	13.95	1991	14.69	2140	13.99	2003
Khulna	10.65	1406	13.35	1901	12.44	1865	13.14	1883
Rajshahi	10.02	1070	10.62	1311	11.94	1809	10.86	1402
Sylhet	9.90	1485	10.76	1614	10.25	1538	10.63	1594
Bangladesh	10.28	1391	12.18	1719	12.67	1908	12.21	1742

The average number of labourer required for per acre weeding at national level is 12.21 and their cost is recorded at Tk. 1742. There is no significant difference for cost of labourers between HYV and hybrid varieties. The minimum number of labourers required per combined Boro is in Barisal division (9.62) but the minimum cost involved for that is in Rajshahi (Tk 1402). On the other land, the maximum number of labourers required is in Dhaka division(13.99) but the maximum cost incurred is in Chittagong division (Tk.2066).

Table 3.10(e). Per acre no. of labourers engaged and cost of harvesting by division and by variety of boro paddy

Division	Local Boro		HYV Boro		Hybrid		Combined Boro	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	9.03	1366	11.72	1812	11.48	1783	11.59	1792
Chittagang	9.68	1472	14.39	2580	13.78	2576	14.14	2541
Dhaka	10.18	1561	14.15	2322	13.45	2215	13.91	2280
Khulna	11.43	1709	14.36	2485	14.57	2241	14.32	2427
Rajshahi	11.44	1679	13.04	2054	13.69	2280	13.14	2091
Sylhet	12.28	1855	12.92	1940	11.55	1770	12.67	1909
Bangladesh	10.91	1645	13.64	2234	13.48	2220	13.53	2214

The average number of labour required for per acre harvesting at national level is 13.53 and their cost is recorded at Tk. 2214. There is no significant difference for cost of labour between HYV and hybrid varieties.

Table 3.10(f). Per acre no. of labourers engaged and cost of thrashing by division and by variety of boro paddy.

Division	Local Boro		HYV Boro		Hybrid		Combined Boro	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	4.83	714	5.49	851	4.74	815	5.35	840
Chittagang	4.24	705	5.50	850	5.80	1006	5.51	868
Dhaka	5.85	844	5.75	862	5.61	822	5.73	854
Khulna	4.82	731	4.19	628	5.90	885	4.48	672
Rajshahi	4.50	652	6.04	906	6.14	866	6.03	894
Sylhet	4.02	602	5.09	762	4.75	712	4.97	744
Bangladesh	4.81	717	5.50	828	5.74	854	5.52	829

The average number of labourers required for per acre thrashing at national level is 5.52 and their cost is recorded at Tk. 829. Except local Boro, there is no significant difference between HYV and hybrid Boro in respect of the number of labourers and costs. Comparing to national level, Khulna and Sylhet spent less for per acre thrashing work.

3.11 Number and cost of Family and Hired labourers:

Table-3.11(a): Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing local Boro paddy.

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	PC(%) of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	5.88	4.41	2.73	2.73	3.15	4.83	5.25	3.78	2.31	2.52	37.61	13.45	35.75
Chittagang	3.25	4.06	4.48	5.68	4.88	5.52	3.12	6.56	2.08	2.16	42.40	14.56	34.34
Dhaka	4.11	4.14	2.40	7.22	3.49	7.40	2.01	8.18	1.37	4.48	45.60	9.27	20.33
Khulna	3.39	4.41	2.80	6.77	3.42	7.23	1.63	9.80	1.79	3.03	45.41	9.64	21.23
Rajshahi	4.30	2.96	1.65	7.63	1.54	8.48	1.71	9.73	0.68	3.81	42.35	5.58	13.17
Sylhet	2.88	2.75	2.38	8.50	2.52	7.38	3.04	9.24	0.84	3.18	42.90	8.78	20.46
Bangladesh	3.74	3.69	2.60	7.10	3.08	7.20	2.43	8.48	1.32	3.49	43.59	9.43	21.62

Table 3.11(a) focuses on percentage of family labourers by division and national level as well. From the table, it is evident that per acre total number of labourers employed is 43.59 in all phases of which total family labourer is 9.43. It is also revealed from the table that percentage of family labourer involved in Local Boro production at national level is 21.62%. Maximum percent (35.75) is found in Barisal division and minimum is in Rajshahi (13.17) division.

Table3.11(b): Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing HYV Boro paddy.

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	PC(%) Of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	2.42	3.32	4.18	6.84	3.77	5.73	3.33	8.39	0.61	4.89	41.17	11.88	28.85
Chittagang	2.59	2.96	4.49	7.20	6.19	6.49	5.42	8.97	3.29	2.21	47.57	19.39	40.75
Dhaka	3.90	3.86	2.71	8.48	4.26	9.70	2.77	11.38	1.47	4.28	49.16	11.20	22.79
Khulna	3.10	3.79	2.38	9.73	4.41	8.94	3.16	11.20	1.48	2.71	48.38	11.43	23.63
Rajshahi	2.67	3.54	1.98	9.24	2.92	7.70	2.19	10.85	1.13	4.91	45.14	8.22	18.21
Sylhet	2.63	2.74	3.87	6.48	5.47	5.29	3.61	9.30	1.18	3.91	42.07	14.13	33.60
Bangladesh	3.02	3.52	2.80	8.51	4.17	8.01	3.05	10.59	1.50	3.99	46.59	11.53	24.74

Table 3.11(b) focuses on percentage of family labourers by division and national level as well. It is observed from the table that number of family labourers involved in HYV Boro production at national level is 11.53. Maximum is found in Chittagong(19.39) division and minimum is in Rajshahi (8.22) if we consider the data from sowing/planting to thrashing.

Table-3.11(c): Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing Hybrid Boro paddy.

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	PC(%) of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	2.95	3.63	4.30	6.91	4.34	6.25	3.81	7.67	0.31	4.43	40.59	12.76	31.44
Chittagang	2.71	3.81	4.56	7.16	5.93	6.55	5.12	8.66	3.22	2.58	45.63	18.83	41.28
Dhaka	3.48	3.66	2.52	8.80	3.99	10.70	2.78	10.67	1.46	4.16	46.28	10.74	23.21
Khulna	3.93	3.61	0.95	11.97	2.20	10.24	1.04	13.53	0.54	5.37	50.24	4.73	9.41
Rajshahi	2.54	3.01	1.97	9.94	2.78	9.17	2.32	11.37	1.06	5.08	44.76	8.13	18.17
Sylhet	3.17	2.57	4.20	7.09	5.69	4.57	2.96	8.59	0.98	3.76	38.42	13.83	36.01
Bangladesh	3.25	3.45	2.52	9.26	3.66	9.01	2.65	10.83	1.27	4.47	45.35	10.10	22.28

Percentage of family labourers employed for per acre production of hybrid Boro at national and divisional level is shown in table 3.11(c). The table describes that at national level the percentage of family labourer is 22.28, the highest percentage (36.01) is observed in Sylhet division and the lowest (9.41) is in Khulna. Here it is also mentionable that gap between the percentage of highest and lowest number of family labourer is very much significant.

Table-3.11(d): Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing combined Boro paddy

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	PC(%) of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	2.68	3.42	4.15	6.75	3.85	5.79	3.47	8.15	0.62	4.75	41.07	12.09	29.44
Chittagang	2.64	3.10	4.50	7.14	6.11	6.47	5.30	8.85	3.24	2.26	47.12	19.15	40.64
Dhaka	3.89	3.87	2.67	8.51	4.19	9.82	2.75	11.18	1.47	4.27	48.59	11.07	22.78
Khulna	3.24	3.80	2.16	10.01	4.03	9.11	2.79	11.53	1.34	3.15	48.62	10.32	21.23
Rajshahi	2.70	3.49	1.98	9.36	2.88	8.00	2.21	10.95	1.11	4.93	45.10	8.18	18.14
Sylhet	2.68	2.73	3.92	6.87	5.37	5.39	3.54	9.34	1.13	3.93	42.26	13.95	33.01
Bangladesh	3.08	3.52	2.76	8.62	4.06	8.17	2.97	10.60	1.46	4.08	46.40	11.25	24.24

Total number of labourer, family labourer, the percentage of family labourer, hired labourer required for per acre production of Boro paddy are exhibited in table 3.11(d). From this table it is clear that at national level out of 46.40 labourers, 11.25 are family labourer that represent 24.24 % of the total labourers.

If the divisional figures are considered and compared with that of national level, it reveals that the highest number of family labourer (19.15) are entangled in Boro production in Chittagang division which represents 40.64% of the total labourer, whereas the lowest (8.18) is in Rajshahi which represents 18.14% of the total.

3.12. Other cost:

Table 3.12. Per acre other cost by division and by variety of Boro paddy

(Fig. in Tk.)

Division	Local Boro	HYV Boro	Hybrid Boro	Combined Boro
Barisal	78	131	125	128
Chittagang	232	255	261	255
Dhaka	102	197	169	189
Khulna	160	261	148	240
Rajshahi	226	348	232	324
Sylhet	68	132	148	130
Bangladesh	140	251	193	238

Table 3.12 depicts that per acre other cost for Boro cultivation stands at Tk. 238 in Bangladesh. Here other cost includes cost for cleaning of paddy after thrashing and any other related cost not included in planting, weeding, harvesting and thrashing. Other cost for HYV Boro is much higher compared to local and hybrid varieties.

3.13 Production cost:

Table 3.13(a): Per acre Cost (Tk.) for Boro cultivation by components, 2008-09

(Fig. in Tk)

Division	Leasing	Land Preparation	Seeds	Seed-bed Preparation	Plucking of seedling	Purchase of Seedlings	Planting	Irrigation	Fertilizer	Weeding	Insecticides	Harvesting	Thrashing	Others	Total
Barisal	3314	1897	476	476	586	543	1909	7728	2792	1508	815	1792	840	128	24806
Chittagong	3758	1899	442	558	535	531	2033	7645	3148	2066	674	2541	868	255	26953
Dhaka	4148	1942	489	731	626	528	1715	9594	3224	2003	527	2280	854	189	28851
Khulna	3718	1867	442	537	634	450	1690	10697	3447	1883	689	2427	672	240	29391
Rajshahi	3806	1832	490	468	583	420	1594	10362	3716	1402	628	2091	894	324	28608
Sylhet	3558	1854	404	454	452	640	1595	6473	2483	1594	278	1909	744	130	22567
Bangladesh	3717	1882	467	554	585	489	1704	9425	3315	1742	600	2214	829	238	27763
Pc(%)	13.39%	6.78	1.68	2.00	2.12	1.76	6.14	33.75	11.94	6.27	2.16	7.97	2.99	0.86	100

Analyzing the costs by phases at national level, the table 3.13(a) stated above focuses that for Boro cultivation irrigation cost is the maximum (33.75%) followed by leasing (13.39%) and fertilizer (11.94%). Seed-bed preparation, Plucking of seedlings, Planting, Weeding, Harvesting and Thrashing works are done labourers and expenditures under these components are practically labourers ways and it represents 28.34% of the total cost. Other means the wages of some additional labourers employed in different components. Phase wise cost in percentage (%) is shown in the pi-chart below:

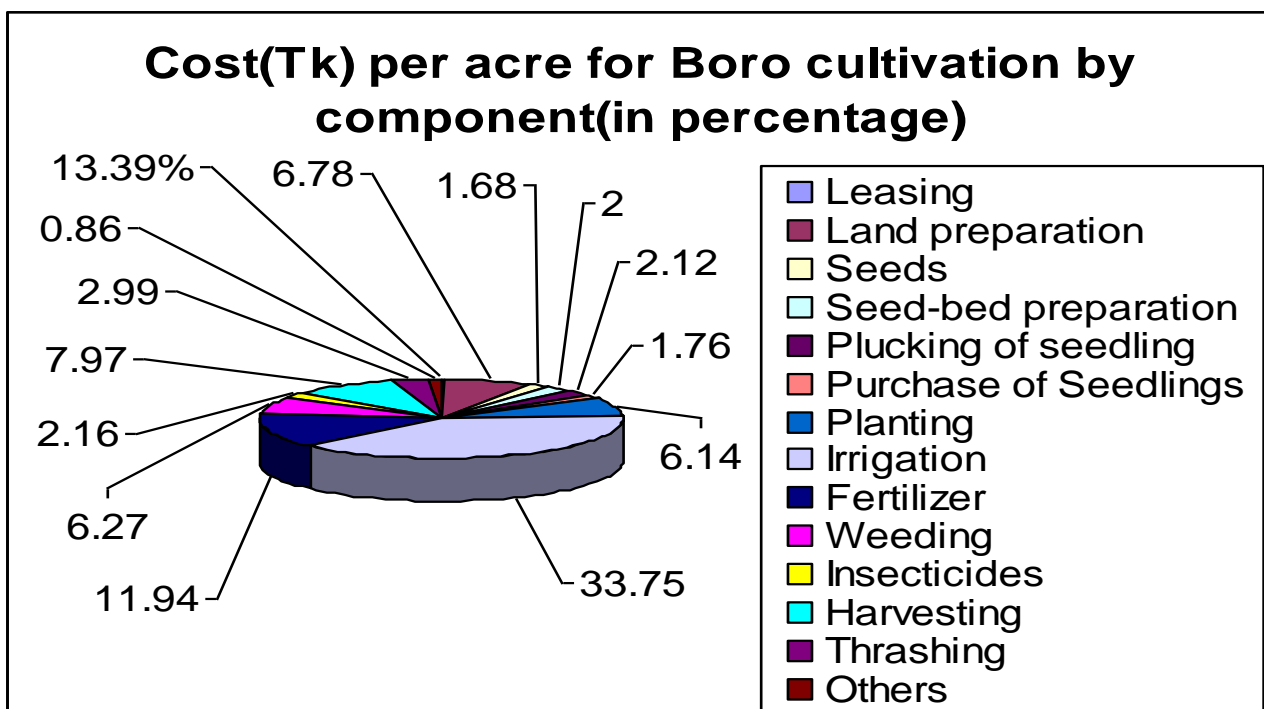


Figure 7: Cost (Tk) per acre for Boro Cultivation by phases (in percentage)

Table 3.13(b). Per acre production cost (Tk) of Boro paddy by division and by varieties (Fig. in Tk.)

Division	Local Boro	HYV Boro	Hybrid	Combined Boro
Barisal	18863	23115	34097	24806
Chittagang	20682	25758	35088	26953
Dhaka	19219	28104	34536	28851
Khulna	19563	29276	31431	29391
Rajshahi	19121	27598	33544	28608
Sylhet	17361	21394	31291	22567
Bangladesh	19009	26854	33440	27763

The average per acre production cost of Boro crop in Bangladesh is recorded at Tk. 27763. The variation in divisions is not very significant except Sylhet division. Khulna and Rajshahi division shows the highest Tk 29391 followed by Dhaka division of Tk. 28851.

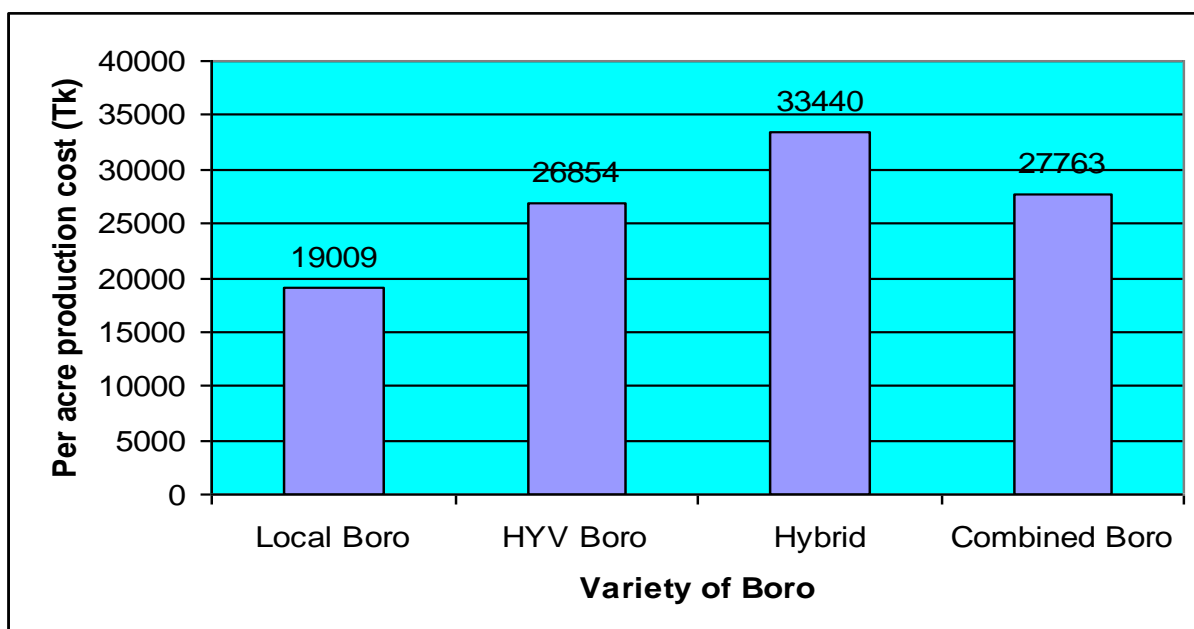


Figure 6. Per acre Production cost (Tk.) of Boro by variety in Bangladesh.

Figure 6 also portrays that per acre production cost for hybrid Boro is the maximum value (Tk 33440) and local Boro is the minimum value (Tk 19000).

Table 3.13(c). Per KG production cost (Tk) of Boro paddy by division and by variety.

Division	Local Boro	HYV Boro	Hybrid	Combined Boro
Barisal	11.66	10.56	12.47	10.99
Chittagang	15.54	12.53	12.95	12.66
Dhaka	15.28	13.17	13.04	13.12
Khulna	14.91	14.10	12.31	13.78
Rajshahi	13.70	13.04	12.05	12.81
Sylhet	15.47	9.43	11.57	9.98
Bangladesh	14.78	12.63	12.41	12.62

It is seen from the table 3.13(a) that the average per kilogram production cost of Boro crop in Bangladesh is recorded at Tk. 12.62. The highest cost is seen in Khulna division (Tk.13.78), followed by Dhaka (Tk.13.12). Hybrid Boro has the lowest per kg cost of Tk 12.41. Sylhet division produced HYV Boro with lowest cost of Tk. 9.93 per kg.

3.14 Production and value:

Table 3.14(a). Per acre production (maund) and value (Tk) of Boro paddy by div. and by varieties.

(Value in Tk.)

Division	Local Boro		HYV Boro		Hybrid		Combined Boro	
	Maund	value	Maund	value	Maund	value	Maund	value
Barisal	40.45	23294	54.72	32279	68.37	35796	56.42	32539
Chittagang	33.28	19151	51.38	29586	67.77	35448	53.22	30104
Dhaka	31.44	18095	53.36	30846	66.20	34677	54.96	31139
Khulna	32.80	18881	51.90	29889	63.84	33422	53.33	30177
Rajshahi	34.90	20112	52.92	30478	69.57	36480	55.82	31458
Sylhet	28.05	16153	56.73	32654	67.63	35335	56.52	31981
Bangladesh	32.16	18513	53.16	30677	67.39	35298	55.00	31121

- 1 maund=40Kg.

It is seen from table 3.14(a) that per acre average yield rate of Boro crop is 55.00 maunds and its value is recorded at Tk. 31121. The highest yield rate (56.52) maunds is achieved in Sylhet division while Chittagong division witnessed the lowest (53.22) maunds.

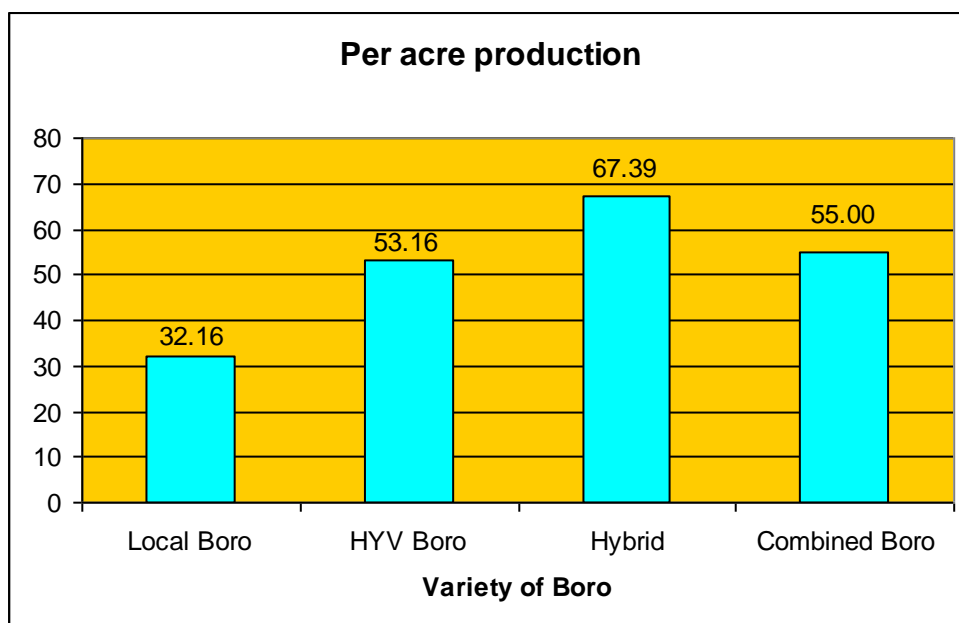


Figure 5. Per acre production (Maund) by variety of Boro in Bangladesh (67.39maunds)

In case of per acre production of Boro, Hybrid Boro ranks the top position while local Boro remains at the bottom (32.16 maunds).

Table 3.14(b). Per acre production(maund)and value(Tk.) of by-product by div. and variety.
(Fig. in Tk.)

Division	Local Boro		HYV Boro		Hybrid		Combined Boro	
	Maund	value	Maund	value	Maund	value	Maund	value
Barisal	40.34	2122	32.56	2208	35.36	2218	33.27	2206
Chittagang	27.76	2442	45.41	2533	45.21	2468	44.76	2520
Dhaka	33.22	2664	40.01	2336	41.14	2660	40.01	2403
Khulna	27.99	2382	41.07	2625	36.59	1707	40.03	2472
Rajshahi	30.46	2852	43.31	1967	46.54	2139	43.72	2014
Sylhet	32.96	2826	32.50	1939	31.07	1791	32.31	1975
Bangladesh	31.63	2639	40.76	2245	41.66	2234	40.65	2255

Table 3.14(b) reveals that per acre production of by-product of Boro crop at national level is 40.65 maunds for which market value is Tk.2255. The highest per acre production is seen in Chittagong (Tk.2520) and the lowest is in Sylhet (Tk.1975).

3.15 Productivity:

Table 3.15. Per acre productivity of Boro paddy by division.

Division	Total production cost per acre (Tk.)	Total farmgate Value per acre (Tk.)			Productivity
		Paddy	Straw	Total	
Barisal	24806	32539	2206	34745	1.40
Chittagong	26953	30104	2520	32624	1.21
Dhaka	28851	31139	2403	33542	1.16
Khulna	29391	30177	2472	32649	1.11
Rajshahi	28608	31458	2014	33472	1.17
Sylhet	22567	31981	1975	33956	1.5
Bangladesh	27763	31121	2255	33376	1.2

Table 3.15 exposes the productivity of the cost by division and national level as well. It is the most significant component of production because it determines whether producers will continue the production of the respective goods. If it is greater than one it means that the producer becomes benefited and he will be interested to continue the production of those goods; and if it is less than one it means that the producer will be looser and he will quit the production of those goods. It is unearthed from the table that productivity of Boro paddy at national level is 1.20 ie. greater than one which means that farmers get some profit from the production of Boro paddy. Maximum (1.50) productivity is noticed in Sylhet division and minimum (1.11) in Khulna division.

3.16. By size of land planted Boro:

Per decimal production cost and production value by size of land planted have been shown below. Here size of land planted means land planted under Boro cultivation by the households in the sample area. Land size planted has been divided into 8 classes.

Table-3.16(a): Distribution of per decimal production cost (excluding leasing) by size of land planted for Boro crop 2008-09.

(Fig. in Tk.)

Size of land planted (Acres)	Cost (Tk.)						
	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	24.63	25.91	38.56	10.56	80.52	106.04	286.21
0.05 – 0.49	21.90	26.78	34.96	7.06	96.81	73.07	260.58
0.50 – 0.99	19.34	17.56	33.37	6.05	87.20	68.54	232.06
1.00 – 1.49	18.39	15.16	32.48	5.78	90.32	65.39	227.52
1.50 – 2.49	17.38	12.84	32.09	5.58	100.83	65.39	234.12
2.50 – 4.99	14.92	12.71	32.73	5.06	102.25	59.19	226.86
5.00 – 7.49	12.24	12.35	28.79	3.22	114.84	55.33	226.76
7.50+	10.50	9.13	28.99	4.14	100.12	58.28	211.15
Total	18.83	20.62	33.16	6.00	94.30	67.31	240.21

It appears from the table that per decimal total production cost stands at Tk. 240.21. Of the total cost, irrigation cost is the highest (Tk.94.30), followed by other cost (Tk.67.31) and fertilizer cost (Tk.33.16). The table further shows that per decimal production cost is increased for all components where land size is decreased. Only in case of irrigation the table gives the opposite picture.

Table-3.16(b): Distribution of per decimal production value by size of land planted all for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(Acres)	Product Value (Tk.)	By Product Value (Tk.)	Total value (Tk.)
1	2	3	4
<= 0.04	347.22	30.85	378.07
0.05 – 0.49	318.10	27.95	346.05
0.50 – 0.99	313.26	23.50	336.76
1.00 – 1.49	310.33	21.35	331.68
1.50 – 2.49	310.90	19.88	330.78
2.50 – 4.99	294.77	16.63	311.40
5.00 – 7.49	284.63	10.04	294.67
7.50+	312.49	11.60	324.09
Total	311.21	22.55	333.76

The table depicts that per decimal total production value for total land is Tk.333.76. It is found that per decimal production value is higher where land size is lower.

Table3.16(c): Distribution of per decimal production cost (excluding leasing) by size of land planted and tenureship 2008-09 Boro crop.

(Fig. in Tk)

Size of land planted(Acres)	Tenure ship					All
	Own	Share	Mortgage	Lease	Others	
<= 0.04	296.15	218.00	204.75	0.00	297.33	286.21
0.05 – 0.49	264.22	253.81	258.02	246.93	275.83	260.58
0.50 – 0.99	233.83	227.50	228.60	225.16	252.72	232.06
1.00 – 1.49	232.60	203.59	227.59	227.48	227.07	227.52
1.50 – 2.49	240.55	219.61	199.21	211.74	243.00	234.12
2.50 – 4.99	232.79	206.69	201.89	189.06	175.99	226.86
5.00 – 7.49	233.27	204.93	0.00	209.40	158.78	226.76
7.50 +	211.15	0.00	0.00	0.00	0.00	211.15
Total	243.81	228.89	238.18	233.99	238.13	240.21

The table clearly shows that per decimal production cost is high where the land size under Boro cultivation is low. Some fluctuations are found in different types of tenure ship. In the size class of <= 0.04 acres no cultivation of Boro is found and in the class internal of 5.00-7.49 acres no Boro cultivation is recorded under mortgage system. Boro cultivation of all sizes of land is observed only under own land.

Table 3.16(d): Distribution of per decimal production value by size of land planted and tenureship for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(Acres)	Tenure ship					All
	Own	Share	Mortgage	Lease	Others	
<= 0.04	410.31	334.50	281.25	0.00	393.33	378.07
0.05 – 0.49	350.39	338.95	331.78	343.96	343.16	346.05
0.50 – 0.99	339.66	334.75	329.70	327.01	323.43	336.76
1.00 – 1.49	330.74	332.51	334.90	339.53	304.44	331.68
1.50 – 2.49	334.02	325.29	312.30	320.02	269.30	330.78
2.50 – 4.99	311.14	319.30	304.83	295.68	328.03	311.40
5.00 – 7.49	292.46	310.30	0.00	306.32	290.94	294.67
7.50 +	324.09	0.00	0.00	0.00	0.00	324.09
Total	335.14	332.70	326.74	332.58	320.27	333.76

Per decimal production value is observed to be higher where land size is lower; but only exception is found in case of farmers of size land 7.50 acres and above.

Table 3.16(e): Distribution of per decimal production cost (excluding leasing) by size of land planted and variety for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(Acres)	Variety			All
	Local Boro	HYV Boro	Hybrid Boro	
<= 0.04	198.75	271.92	351.00	286.21
0.05 – 0.49	167.59	247.49	309.46	260.58
0.50 – 0.99	156.44	223.65	295.08	232.06
1.00 – 1.49	137.36	220.14	290.09	227.52
1.50 – 2.49	130.60	230.18	266.09	234.12
2.50 – 4.99	140.54	221.95	265.01	226.86
5.00 – 7.49	-	230.38	219.51	226.76
7.50 +	-	211.15	-	211.15
Total	154.65	232.26	293.78	240.21

Per decimal production cost of Boro all is Tk.240.21. For local Boro, per decimal production cost is Tk.154.65. For HYV and Hybrid Boro Per decimal production costs are Tk.232.26 and Tk.293.78. For HYV and Hybrid paddy cultivation, farmers invested more money for different inputs to get higher production.

Table 3.16(f): Distribution of per decimal production value by size of land planted and variety of Boro crop for 2008-2009.

(Fig. in Tk)

Size of land planted(Acres)	Variety			All
	Local Boro	HYV Boro	Hybrid Boro	
<= 0.04	281.25	401.65	375.83	378.07
0.05 – 0.49	222.15	340.59	383.08	346.05
0.50 – 0.99	201.00	332.29	385.88	336.76
1.00 – 1.49	207.87	328.21	377.35	331.68
1.50 – 2.49	203.15	326.50	369.26	330.78
2.50 – 4.99	210.03	311.10	337.57	311.40
5.00 – 7.49	-	288.55	307.43	294.67
7.50 +	-	324.09	-	324.09
Total	211.53	329.22	375.33	333.76

The table shows that per decimal production value for all varieties combined is Tk.333.76. It is noticed that for the farmers of low land size the production value is high excepting the value of the land size 7.50 acres and above. Fluctuating values are found in case of Hybrid variety.

3.17 Sampling Error and data reliability:

Using the random group method the estimated variance of R has the following form

$$\text{Var}^{\text{R}} = \frac{\sum_{g=1} (R_g - R)^2}{K(K-1)}$$

Where: R= the estimated average cost (land preparation / seed related/ fertilizer / Pesticide /irrigation /other)

R_g = the estimated mean for the g^{th} random group

K = the number of random group

Table-17(a): Estimated average production cost (excluding leasing) per kg for the 2008-09 variety wise Boro crops and their standard errors

Variety of Boro	Total		Land preparation		Seed related		Fertilizer		Pesticide		Irrigation		Others	
	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E
Local	12.52	0.1435	1.04	0.0307	2.17	0.1306	1.78	0.0519	0.43	0.0233	2.94	0.1261	4.16	0.1358
HYV	10.92	0.0376	0.89	0.0079	0.95	0.0103	1.55	0.0104	0.28	0.0025	4.09	0.1922	3.16	0.1806
Hybrid	10.90	0.0868	0.70	0.0049	0.95	0.0570	1.32	0.0163	0.24	0.0030	5.09	0.0647	2.60	0.0280
Boro	10.93	0.0261	0.87	0.0077	0.95	0.0197	1.51	0.0032	0.27	0.0035	4.26	0.3167	3.07	0.1569

From the above table the average production cost per kg for local Boro of 12.52 taka is not significantly different from the 10.92 taka average production cost for HYV crops at 95% confidence level. The average production cost per kg of local Boro of 12.52 taka is significantly different from the 10.90 taka average production cost for Hybrid Boro crops at 95% confidence level. Where as, the average production cost per kg of HYV and Hybrid are almost same.

Although the estimated production cost per kg for local Boro is subject to higher standard errors than for local HYV Boro crops. Similarly the estimated production cost per kg for local Boro is also subject to higher standard errors than for Hybrid Boro. Production cost for all estimates have acceptable reliability in terms of sampling error.

Table-3.17(b): Estimated average production cost (excluding leasing) per decimal for the 2008- 09 variety wise Boro crops and their standard errors.

Variety of Boro	Total		Land preparation		Seed related		Fertilizer		Pesticide		Irrigation		Others	
	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E
Local	161.0	0.9604	13.4	0.5403	28.0	0.8986	22.9	0.3965	5.6	0.2893	37.8	0.8519	53.3	0.7064
HYV	332.2	0.6008	19.0	0.1508	20.1	0.3336	33.0	0.2006	5.9	0.0603	86.9	0.4304	167.3	0.1889
Hybrid	293.7	0.9344	18.9	0.1901	25.5	0.4754	35.5	0.4725	6.5	0.1321	137.2	0.8699	70.1	0.3726
Boro	240.5	0.9115	18.8	0.2392	30.0	0.3776	33.2	0.2776	6.0	0.0789	94.3	0.7746	58.2	0.1766

The average production cost per decimal for local Boro of 161.0 taka is significantly different from the 332.2 taka average production cost for HYV Boro crops at 95% confidence level. Similarly the average production cost per kg of local Boro of 161.0 taka is significantly different from the 293.7 taka average production cost for Hybrid Boro crops at 95% confidence level.

However the estimated production cost per decimal for local and Hybrid Boro production cost were subject to higher standard errors than for HYV Boro crop. Production cost for all estimates have acceptable reliability in terms of sampling error.

Chapter-IV

Statistical Table

Statistical Table

Table-4.1: Distribution of per decimal production cost (excluding leasing) by size of land planted(acres) for Boro crop 2008-09.

(Fig. in Tk.)

Size of land planted (Acres)	Cost(Tk.)						
	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	24.63	25.91	38.56	10.56	80.52	106.04	286.21
0.05 – 0.49	21.90	26.78	34.96	7.06	96.81	73.07	260.58
0.50 – 0.99	19.34	17.56	33.37	6.05	87.20	68.54	232.06
1.00 – 1.49	18.39	15.16	32.48	5.78	90.32	65.39	227.52
1.50 – 2.49	17.38	12.84	32.09	5.58	100.83	65.39	234.12
2.50 – 4.99	14.92	12.71	32.73	5.06	102.25	59.19	226.86
5.00 – 7.49	12.24	12.35	28.79	3.22	114.84	55.33	226.76
7.50+	10.50	9.13	28.99	4.14	100.12	58.28	211.15
Total	18.83	20.62	33.16	6.00	94.30	67.31	240.21

Table-4.2: Distribution of per decimal production value by size of land planted(acres) for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(Acres)	Product Value (Tk.)	By Product Value (Tk.)	Total value (Tk.)
1	2	3	4
<= 0.04	347.22	30.85	378.07
0.05 – 0.49	318.10	27.95	346.05
0.50 – 0.99	313.26	23.50	336.76
1.00 – 1.49	310.33	21.35	331.68
1.50 – 2.49	310.90	19.88	330.78
2.50 – 4.99	294.77	16.63	311.40
5.00 – 7.49	284.63	10.04	294.67
7.50+	312.49	11.60	324.09
Total	311.21	22.55	333.76

Table-4.3: Distribution of per decimal production cost (excluding leasing) for own land size of land planted(acres) for Boro crop 2008-09.

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	25.00	19.09	41.88	14.00	82.25	113.94	296.15
0.05 – 0.49	22.03	27.32	35.42	7.23	98.42	73.80	264.22
0.50 – 0.99	19.46	18.06	33.42	6.12	88.88	67.90	233.83
1.00 – 1.49	18.32	15.71	33.38	5.56	94.93	64.70	232.60
1.50 – 2.49	17.60	12.64	33.16	5.47	106.51	65.16	240.55
2.50 – 4.99	15.10	12.71	32.63	5.03	108.07	59.26	232.79
5.00 – 7.49	12.44	10.75	31.28	2.91	118.53	57.36	233.27
7.50+	10.50	9.13	28.99	4.14	100.12	58.28	211.15
Total	18.77	20.61	33.62	5.94	98.03	66.85	243.81

Table-4.4: Distribution of per decimal production value of own land planted(acres) for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	386.88	23.44	410.31
0.05 – 0.49	321.58	28.80	350.39
0.50 – 0.99	315.49	24.17	339.66
1.00 – 1.49	308.99	21.76	330.74
1.50 – 2.49	313.79	20.24	334.02
2.50 – 4.99	293.89	17.25	311.14
5.00 – 7.49	282.62	9.54	292.46
7.50+	312.49	11.60	324.09
Total	312.31	22.83	335.14

Table-4.5: Distribution of per decimal production cost (excluding leasing) of land planted(acres) for Boro crop 2008-09

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	23.75	12.50	31.75	6.25	50.00	93.75	218.00
0.05 – 0.49	21.32	26.12	34.19	5.86	93.28	73.05	253.81
0.50 – 0.99	19.55	16.72	33.89	5.03	82.77	69.54	227.50
1.00 – 1.49	18.58	12.18	31.65	5.16	72.26	63.75	203.59
1.50 – 2.49	17.24	16.23	30.99	5.54	85.14	64.47	219.61
2.50 – 4.99	12.10	16.00	35.79	5.82	66.78	60.21	206.69
5.00 – 7.49	6.90	16.00	9.40	4.63	130.00	38.00	204.93
7.50+	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	18.89	20.46	32.91	5.38	83.52	67.73	228.89

Table-4.6: Distribution of per decimal production value of land under crop sharing by size of land planted(acres) for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	312.00	22.50	334.50
0.05 – 0.49	312.34	26.62	338.95
0.50 – 0.99	311.69	23.06	334.75
1.00 – 1.49	312.47	20.03	332.51
1.50 – 2.49	305.42	19.87	325.29
2.50 - 4.99	306.94	12.71	319.30
5.00 – 7.49	300.00	10.30	310.30
7.50+	0.00	0.00	0.00
Total	310.57	22.13	332.70

Table-4.7: Distribution of per decimal production cost (excluding leasing) of land under mortgage by size of land planted(acres) for Boro crop 2008-09.

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	20.00	32.50	24.00	6.00	38.50	83.75	204.75
0.05 – 0.49	20.46	26.68	34.05	6.00	95.07	75.77	258.02
0.50 – 0.99	18.53	16.73	33.78	5.42	81.47	72.65	228.60
1.00 – 1.49	19.52	13.19	30.12	6.81	87.18	70.77	227.59
1.50 – 2.49	17.33	13.00	25.37	6.42	71.02	66.07	199.21
2.50 – 4.99	17.14	13.00	31.98	3.31	78.47	57.99	201.89
5.00 – 7.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7.50+	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	18.97	22.51	32.20	5.70	87.63	71.17	238.18

Table-4.8: Distribution of per decimal production value of land under mortgage by size of land planted(acres) for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	234.25	47.00	281.25
0.05 – 0.49	303.88	27.91	331.78
0.50 – 0.99	306.22	23.47	329.70
1.00 – 1.49	308.79	26.10	334.90
1.50 – 2.49	292.02	20.28	312.30
2.50 - 4.99	287.88	16.95	304.83
5.00 – 7.49	0.00	0.00	0.00
7.50+	0.00	0.00	0.00
Total	302.57	24.17	326.74

Table-4.9: Distribution of per decimal production cost (excluding leasing) of land under land lease by size of land planted(acres) for Boro crop 2008-09.

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.05 – 0.49	23.27	23.55	34.35	8.77	92.15	64.85	246.93
0.50 – 0.99	18.59	16.55	29.66	7.86	86.46	66.05	225.16
1.00 – 1.49	18.53	14.28	27.24	7.73	88.73	70.97	227.48
1.50 – 2.49	14.67	7.03	25.73	6.30	87.48	70.54	211.74
2.50 – 4.99	15.96	12.00	20.48	7.15	72.62	60.85	189.06
5.00 – 7.49	13.37	10.00	32.29	4.50	90.48	58.77	209.40
7.50+	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	19.16	19.67	30.00	7.81	90.43	66.93	233.99

Table-4.10: Distribution of per decimal production value of land under land lease by size of land planted(acres) for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	0.00	0.00	0.00
0.05 – 0.49	318.91	25.05	343.96
0.50 – 0.99	307.25	19.76	327.01
1.00 – 1.49	321.35	18.18	339.53
1.50 – 2.49	306.18	13.84	320.02
2.50 - 4.99	290.77	4.90	295.68
5.00 – 7.49	289.88	16.44	306.32
7.50+	0.00	0.00	0.00
Total	312.66	19.92	332.58

Table-4.11: Distribution of per decimal production cost (excluding leasing) of land under other by size of land planted(acres) for Boro crop 2008-09.

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	30.00	20.00	49.33	10.00	108.00	80.00	297.33
0.05 – 0.49	24.11	28.15	33.78	7.60	107.01	75.17	275.83
0.50 – 0.99	19.89	12.85	38.83	7.67	102.00	71.49	252.72
1.00 – 1.49	13.67	13.72	37.45	7.83	89.68	64.73	227.07
1.50 – 2.49	19.28	10.12	43.90	12.95	81.93	74.82	243.00
2.50 – 4.99	10.33	10.00	31.77	10.22	60.00	53.68	175.99
5.00 – 7.49	12.79	10.00	25.25	3.39	57.22	50.14	158.78
7.50+	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	18.56	19.51	34.17	7.55	91.30	67.04	238.13

Table-4.12: Distribution of per decimal production value of land under other by size of land planted(acres) for Boro crop 2008-09.

(Fig. in Tk)

Size of land planted(acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	333.33	60.00	393.33
0.05 – 0.49	318.92	24.84	343.16
0.50 – 0.99	304.92	18.84	323.43
1.00 – 1.49	289.91	14.53	304.44
1.50 – 2.49	247.01	22.29	269.30
2.50 - 4.99	317.63	10.40	328.03
5.00 – 7.49	282.10	8.85	290.94
7.50+	0.00	0.00	0.00
Total	302.20	18.07	320.27

Table-4.13: Distribution of per decimal production cost (excluding leasing) of land under variety by size of land planted(acres) for Boro crop 2008-09.

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	20.00	32.50	24.00	0.00	38.50	83.75	198.75
0.05 – 0.49	16.00	24.54	24.04	5.80	42.03	55.19	167.59
0.50 – 0.99	12.48	20.06	24.72	5.75	37.74	55.69	156.44
1.00 – 1.49	11.98	17.31	20.31	5.61	33.34	48.81	137.36
1.50 – 2.49	8.01	18.64	15.51	2.42	28.26	57.77	130.60
2.50 – 4.99	11.81	22.24	24.78	6.04	32.69	42.99	140.54
5.00 – 7.49	0	0	0	0	0	0	0
7.50+	0	0	0	0	0	0	0
Total	13.40	21.47	23.05	5.48	37.75	53.50	154.65

Table-4.14: Distribution of per decimal production value of land under variety of land planted(acres) for Local Boro crop.

(Fig. in Tk)

Size of land planted(acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	234.25	47.00	281.25
0.05 – 0.49	190.91	31.24	222.15
0.50 – 0.99	177.49	23.52	201.00
1.00 – 1.49	184.92	22.95	207.87
1.50 – 2.49	183.86	19.29	203.15
2.50 - 4.99	184.52	25.52	210.03
5.00 – 7.49	0	0	0
7.50+	0	0	0
Total	185.13	26.39	211.53

Table-4.15: Distribution of per decimal production cost (excluding leasing) of land under HYV by size for the crop 2008-09 Buro crop.

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	23.82	23.13	39.71	10.56	66.59	108.12	271.92
0.05 – 0.49	22.13	26.46	34.92	7.33	82.96	73.69	247.49
0.50 – 0.99	19.76	17.05	32.89	6.00	79.33	68.62	223.65
1.00 – 1.49	18.82	14.42	31.79	5.64	84.53	64.95	220.14
1.50 – 2.49	17.65	11.78	32.64	5.37	97.36	65.39	230.18
2.50 – 4.99	14.99	10.18	33.11	4.73	99.86	59.08	221.95
5.00 – 7.49	13.16	10.75	31.92	2.96	110.68	60.92	230.38
7.50+	10.50	9.13	28.99	4.14	100.12	58.28	211.15
Total	19.02	20.12	33.00	5.91	86.98	67.23	232.26

Table-4.16: Distribution of per decimal production value of land under HYV by size of land planted(acres) for Buro crop 2008-09.

(Fig. in Tk)

Size of land planted(acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	378.71	22.94	401.65
0.05 – 0.49	312.80	27.79	340.59
0.50 – 0.99	308.63	23.66	332.29
1.00 – 1.49	306.79	21.42	328.21
1.50 – 2.49	306.30	20.20	326.50
2.50 - 4.99	294.13	16.97	311.10
5.00 – 7.49	278.03	10.52	288.55
7.50+	312.49	11.60	324.09
Total	306.77	22.45	329.22

Table-4.17: Distribution of per decimal production cost (excluding leasing) of land under HYbrid Boro by size of land planted(acres) for 2008-09.

Size of land planted(acres)	Land preparation	Seed	Fertilizer	Pesticide	Irrigation	Other	Total
1	2	3	4	5	6	7	8
<= 0.04	30.00	32.00	45.00	6.00	148.0	90.00	351.00
0.05 – 0.49	22.47	25.80	37.09	6.53	142.64	74.94	309.46
0.50 – 0.99	18.37	22.89	37.59	6.36	139.49	70.40	295.08
1.00 – 1.49	17.07	20.29	39.16	6.68	135.39	71.49	290.09
1.50 – 2.49	16.45	18.02	30.11	7.18	128.31	66.02	266.09
2.50 – 4.99	15.46	15.00	31.82	7.65	130.68	64.41	265.01
5.00 – 7.49	10.32	16.00	22.27	3.74	123.50	43.68	219.51
7.50+							
Total	18.87	25.56	35.57	6.54	137.20	70.06	293.78

Table-4.18: Distribution of per decimal production value of land under HYbrid Boro crop by size of land planted(acres) for 2008-09.

(Fig. in Tk)

Land Size	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	333.33	42.50	375.83
0.05 – 0.49	355.33	27.75	383.08
0.50 – 0.99	363.27	22.61	385.88
1.00 – 1.49	356.74	20.61	377.35
1.50 – 2.49	351.40	17.86	369.26
2.50 - 4.99	325.70	11.87	337.57
5.00 – 7.49	298.40	9.03	307.43
7.50+			
Total	352.98	22.34	375.33

Annexure-A

Concepts and Definitions

Mauza:

Mauza is the demarcated lowest administrative territorial unit having separate jurisdiction list number (J.L.No.) in the revenue records. Every mauza has its well demarcated cadastral map. Mauza should be distinguished from local village since a mauza may consist of one or more villages or part of a village.

Primary Sampling Units (PSUs):

100 Upzilas which have been selected at random from 64 districts are said to be PSUs.

Secondary Sampling Units (SSUs):

100 Mauzas which have been selected from 100 PSUs are said to be SSUs.

Ultimate Sampling Units (USUs):

250 households which have been selected from SSUs following the method of choosing the first one from the south-west corner of the SSU and then moving forwards following serpentine method until having 250 households are said to be USUs.

Enumeration Areas (EAs):

EAs are nothing but the SSUs.

Household (HH):

A household means a group of persons normally living together and eating in one mess (i.e. with common arrangement of cooking) with their dependents, relatives, servants etc. A household may be a one person household or a multi-person household. In other words, when a group of persons living together generally maintain a family or family like relations and take meals from the same kitchen is termed as a household. Popularly, it is described as “Khana”. In some cases there may be more than one household in a single house or in one dwelling arrangement. Similarly, a household may have more than one house or structure or shed.

The household must be distinguished from a family which consists of blood related members who may live in different places but members of the household must share the same kitchen and live together.

Owned land:

Owned land means the area of the land owned by the holder including of his family having a title of land with the right to determine the nature and extent of its use and to transfer the same. Moreover, there might be some land over which the holder or any member of his households has owner-like possession. This type of land was included in the area of owned land. The land held by the holder in owner like possession, can be operated by him in the same way as owned land although the holder does not possess a title of ownership.

Share Cropping:

Land under share cropping is treated as the land which is cultivated under the condition of sharing the crops between land owner and the cultivator. The ratio of share cropping might be varied from place to place. It might be one third (1/3) or half (1/2) or two-third (2/3) between owner and cultivator.

Mortgage:

The land which is taken in exchange of money paid by the mortgagee to the land owner for a fixed period of time under the condition that land would be released upon refunding the money to the mortgagee by the owner is considered as the land under mortgage.

Lease:

The land which is taken by the cultivator from the owner in exchange of a certain amount of money for one year or for any period of time for the purpose of cultivating crop is treated as land under lease. Under this criterion, land will automatically be released from the occupancy of the cultivator after the certain period of time.

Others:

The land which does not satisfy any of the four criterions mentioned earlier is treated as the land under others.

Plot:

Usually land is divided into many pieces for the purposes of cultivation or distributions among the owners of land or making houses. These pieces are commonly called plots. A plot might comprise of land under many identification numbers (Dag Number) or there might have many plots under the land of single identification number. Even a household has many plots which are situated in different mauzas. It is mentionable that under this survey plot means the land in which jute has been cultivated during survey year.

Annexure- B**Statement-I**

Crop	2005Cropped area (acres)	Cropping percent (p)	Minimum Sample size (n)	All farmers in the Mouza (n1)
Amon (4)	10488754	35.00	612	9625
Boro (3)	9272497	30.90	575	8498
Aus (2)	2670787	8.90	220	2448
Wheat	897403	2.99	78	823
Maize	217060	0.72	19	198
Pulses (10)	700651	2.34	60	644
Oil Seeds (12)	1217233	4.06	103	1116
Jute (3)	1117109	3.72	96	1023
Potato	811061	2.70	71	742
Onion	265136	0.88	23	242
Total			1857	25358

Gross cropped area – 2,99,90,170 acres

Annexure- c

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

বাংলাদেশ পরিসংখ্যান ব্যুরো

কৃষি দাগগুচ্ছ হালনাগাদকরণ ও সম্প্রসারণ এবং উৎপাদন খরচ জরিপ প্রকল্প
পরিসংখ্যান ভবন (৭ম তলা, ব-ক-২) ই-২৭/এ, আগারগাঁও, ঢাকা-১২০৭।

বোরো ধান উৎপাদন খরচ জরিপ, ২০০৯

প্রথম অংশ

খানার পরিচিতি

খানার ক্রমিক নম্বর :

খানা প্রধানের নাম : ----- পিতা/স্বামীর নাম-----

জেলা _____ কোড উপজেলা _____ কোড

ইউনিয়ন _____ কোড মৌজা/গ্রাম _____ কোড

দ্বিতীয় অংশ

১। বোরো ধানের প্রকার ভেদে জমির খন্ডের পরিমাণ, মালিকানা, চাষের ধরন এবং খরচ (টাকা)

খন্ড	ধানের প্রকার (কোড)	জমির পরিমাণ (একর)	জমির মালিকানা (কোড)	লীজ নেয়া হলে বাৎসরিক কত টাকা দিতে হয়	চাষের ধরন (নিজস্ব হলে বাজার দরে লিখতে হবে)						
					লাঙ্গল		যান্ত্রিক		অন্যান্য	মোট	
					সংখ্যা	খরচ (টাকা)	সংখ্যা	খরচ (টাকা)			খরচ (টাকা)
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	
১ম											
২য়											
৩য়											
৪র্থ											
৫ম											
৬ষ্ঠ											
৭ম											

ধানের প্রকারের কোড : দেশী-১, উফশী-২ ও হাইব্রীড-৩

মালিকানা কোডঃ নিজস্ব-১, বর্গা-২, বন্ধক-৩, লীজ-৪ এবং অন্যান্য-৫

২। বীজ, বীজতলা প্রস্তুত, চারা উত্তোলন, চারা ক্রয়, চারা বিক্রয় শ্রমিকের সংখ্যা ও খরচ (টাকা)

বীজ তলার প্রকার	বীজ		বীজতলা প্রস্তুতকরণের জন্য চাষ এবং শ্রমিকের সংখ্যা ও খরচ			চারা উত্তোলনের জন্য শ্রমিকের সংখ্যা ও খরচ		চারা ক্রয় (টাকা)	অন্যান্য খরচ (টাকা)	মোট খরচ (টাকা)	মোট বিক্রয় (টাকা)
	পরিমাণ (কেজি)	মূল্য (টাকা)	চাষের সংখ্যা	শ্রমিকের সংখ্যা	খরচ (টাকা)	শ্রমিকের সংখ্যা	খরচ (টাকা)				
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২
দেশী-১											
উফশী-২											
হাইব্রীড-৩											

(পারিবারিক কর্মী হলে মজুরী বাজার দরে লিখতে হবে)

৩। সার ব্যবহারের পরিমাণ (কেজি) এবং মূল্য (টাকা)

খন্ড	ইউরিয়া		টিএসপি		পটাশ (এমওপি)		জিঙ্ক		জিপসাম		গোবর/জেব		অন্যান্য মূল্য	মোট (টাকা)
	পরিমাণ	মূল্য	পরিমাণ	মূল্য	পরিমাণ	মূল্য	পরিমাণ	মূল্য	পরিমাণ	মূল্য	পরিমাণ	মূল্য		
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩	১৪	১৫
১ম														
২য়														
৩য়														
৪র্থ														
৫ম														
৬ষ্ঠ														
৭ম														

৪। কীটনাশক ব্যবহারের পরিমাণ এবং খরচ (টাকা)

খন্ড	বাসুডিন		ফুরাডন/ফুরানল		বিফোর/বিষ্টারোগ		সুনথিয়ন/মেলাথিয়ন		আইপিএম	অন্যান্য	মোট খরচ (টাকা)
	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	খরচ (টাকা)	মূল্য (টাকা)	
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২
১ম											
২য়											
৩য়											
৪র্থ											
৫ম											
৬ষ্ঠ											
৭ম											

৫। সেচের ব্যবহার এবং খরচ (টাকা)

খন্ড	যান্ত্রিক (বিদ্যুৎ)					যান্ত্রিক (ডিজেল)					অন্যান্য (টাকা)	মোট খরচ (টাকা)
	নিজস্ব খরচ (টাকা)	অন্য			নিজস্ব খরচ (টাকা)	অন্য						
		ধানের বিনিময় পরিমাণ (মণ)	খরচ (টাকা)	অর্থের বিনিময় (টাকা)		ধানের বিনিময় পরিমাণ (মণ)	খরচ (টাকা)	অর্থের বিনিময় (টাকা)				
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১		
১ম												
২য়												
৩য়												
৪র্থ												
৫ম												
৬ষ্ঠ												
৭ম												

(১ মণ = ৪০ কেজি)

৬। চারা রোপণ, নিড়ানি/আগাছা পরিস্কার, ধান কর্তন এবং ধান মাড়াই এর শ্রমিকের সংখ্যা ও খরচ (টাকা)

খন্ড	চারা রোপণ			নিড়ানি/আগাছা পরিস্কার			ধান কর্তন			ধান মাড়াই			অন্যান্য খরচ (টাকা)	মোট খরচ (টাকা)
	শ্রমিকের সংখ্যা		খরচ (টাকা)	শ্রমিকের সংখ্যা		খরচ (টাকা)	শ্রমিকের সংখ্যা		খরচ (টাকা)	শ্রমিকের সংখ্যা		খরচ (টাকা)		
	পারিঃ	ভাড়া		পারিঃ	ভাড়া		পারিঃ	ভাড়া		পারিঃ	ভাড়া			
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩	১৪	১৫
১ম														
২য়														
৩য়														
৪র্থ														
৫ম														
৬ষ্ঠ														
৭ম														

পারিঃ পারিবারিক

(পারিবারিক কর্মী হলে মজুরী বাজার দরে লিখতে হবে)

৭। উৎপাদিত ফসল এবং উপজাতের পরিমাণ (মণ) ও মূল্য (টাকা)

খন্ড	ফসল (ধান)		উপজাত (খড়)		মোট উৎপাদিত দ্রব্যের মূল্য (টাকা)
	পরিমাণ (মণ)	মূল্য (টাকা)	পরিমাণ (মণ)	মূল্য (টাকা)	
১	২	৩	৪	৫	৬
১ম					
২য়					
৩য়					
৪র্থ					
৫ম					
৬ষ্ঠ					
৭ম					

(১ মণ=৪০ কেজি)

৮। বোরো মৌসুমে বোরো ধান চাষের জন্য এক একর জমি লীজ নিতে মালিককে কত টাকা দিতে হয়ঃ-----

তথ্য সংগ্রহকারীর নাম -----

সুপারভাইজারের নাম -----

পদবী -----

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তারিখ -----

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