



Report on the Cost of Production of Aman 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

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Key Findings: At a glance

SL. No.	Items of study	Result
1.	Percentage of households having Aman cultivation in the sample area	45.92
2.	Percentage of households growing Aman by land tenure:	
	a. Own	69.78
	b. Share cropping	15.88
	c. Mortgage	7.87
	d. Lease	5.77
	e. Others	0.70
3.	Yield of Aman paddy per acre(in maund)	34.05
4.	Yield of Aman straw per acre (in maund)	11.57
5.	Number of labourers employed by component for per acre production of Aman:	
	a. Seed-bed preparation	3.61
	b. Plucking of seedlings	5.50
	c. Sowing/Planting	10.14
	d. weeding	10.13
	e. Harvesting	11.58
	f. Thrashing	6.75
	Total	42.01
6.	Number of family labourers worked for per acre Aman production	9.46
7.	Production cost of Aman paddy per kilogram (in taka)	12.52
8.	Farmgate price of Aman paddy per kilogram (in taka)	14.84
9.	Farm-gate price of straw per kilogram (in taka):	1.57
10.	Cost of land preparation per acre (in taka):	1826
11.	Cost of seeds per acre (in taka)	597
12.	Cost of seed-bed preparation per acre (in taka)	579
13.	Cost of plucking of seedlings per acre (in taka)	871
14.	Cost of planting of seedlings per acre (in taka)	1531
15.	Purchasing of seedlings per acre (in taka)	321

SL. No.	Items of study	Result
16.	Cost of fertilizers by type per acre (in taka):	
	a. Urea	598
	b. TSP	935
	c. MoP	312
	d. Zinc	28
	e. Gypsum	34
	.f. Organic	123
	g. Other Cost	52
	Total	2083
17.	Cost of insecticides per acre (in taka)	400
18.	Cost of irrigation per acre (in taka)	201
19.	Cost of weeding per acre (in taka)	1627
20.	Cost of harvesting per acre (in taka)	1838
21.	Cost of thrashing per acre (in taka)	1088
22.	Cost of leasing per acre (in taka)	3691

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. Aman is the most important cereal crop which shares about 37% of total rice production (BBS estimate 2008-09). The production of Aman 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 to 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 consistently been allocated 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 influence 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 on the cost of production of Aman paddy.

1.1. Aman :One of the major cereal crops of Bangladesh

The paddy which is harvested in the month of November and December is said to be Aman paddy. Two types of Aman paddy are grown in this country. One is called broadcast Aman which is sown in the month of mid March to mid April in the low lands and another is transplant Aman, which is planted during late June to August. All types of land excepting low lands are brought under Aman cultivation where planting of seedlings is possible. It is purely a tropical monsoon rain dependent crop.

Broadcast Aman/Local transplant Aman: This type of Aman has been cultivating in our country from time immemorial. Though local variety paddy gives lower yield rate, but its rice tastes good and its nutrition value is more.

High yielding variety (HYV) Aman: The name HYV has been originated for its high yielding capacity. HYV Aman are transplanted generally in the flood free zone. Due to increasing demand of cereals local variety is being replaced by HYV. If monsoon rain favours, it does not normally demand irrigation and gives high yield rate.

Hybreed Aman: The planting and harvesting time of Hybreed Aman is the same as that of HYV. It has brought revolutionary change in respect of yield rate.

1.2. Production of Aman:

Bangladesh occupies most lands of the great Bengal plane of the Gangs Delta with affluent alluvial soils. Moreover, it is a riverine area with plentiful water resources with hot and humid monsoon climate. It is a country of tropical monsoon rain. Monsoon rain occurs normally in the month of June to September. However the condition of Bangladesh is blissful for growing Aman paddy. Aman paddy is a rain dependent crop. If nature favours, farmers get a good harvest. Acreage, production and yield rate of Aman rice for last ten years are shown below:

Table: Acreage, Production and yield rate of Aman rice during the last ten years,

Year	Acreage in '000'	Production in '000' M. Tons	Yield rate M. tons
1998-99	12762	7736	0.606
1999-00	14098	10306	0.731
2000-01	14110	11249	0.797
2001-02	13955	10726	0.769
2002-03	14041	11115	0.792
2003-04	14029	11520	0.821
2004-05	13047	9819	0.753
2005-06	13415	10810	0.806
2006-07	13382	10841	0.810
2007-08	12474	9662	0.775

Source : Statistical year book of Bangladesh.

Table : shows that Aman crop is normally cultivated in an area of about 14 million acres. But heavy rains and floods in the years 1998-99, 2004-05, 2005-06, 2006-07 and floods and super cyclone Sidr in 2007-08 damaged the crop area to a significant extent. Due to declined crop areas in those years, production figures have decreased. Ups and downs in respect of yield rate during the last ten years are observed because of favorable and unfavorable weather condition with fluctuating tropical monsoon rains.

1.3. Scope and coverage of the survey.

Survey on the production cost of *Aman* 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. Objective of the survey:

The specific objective of the survey is

- ▶ to estimate per acre production cost of Aman
- ▶ to estimate per kilogram production cost of Aman

The other objectives of the survey are as follows:

- ▶ to know the area under Aman by land tenure
- ▶ to assess the cost of production of Aman by different phases
- ▶ to produce benchmark data on the production cost of Aman
- ▶ to assist the policy maker by supplying data on the cost of production of Aman in order to formulate appropriate policies for increasing the production of Aman 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. Aman 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, growing the particular crop Aman, 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 Aman crop has followed the same design as the integrated sample design for the said 10 crops.

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 become 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 Aman 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 field staff 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- from different departments and university 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 Aman as well. They discussed the matter with the farmers who grow Aman. 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 farmers 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 Aman 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 was 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. On the first day the participants receive rigorous training on the concepts, definitions and the questionnaire and on 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 taken place during March 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 farm households 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 to 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.

2.3 Data Processing:

Data processing involves many steps that are very important because it affects survey results according to the involved steps. During data processing following steps have been taken.

- ❖ 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:

After editing, all questionnaires have been sent to Computer Wing of BBS in order to do all works of data processing. Computer Wing has maintained the steps as mentioned aiming to ensure perfect data processing:

1. Software Used: Five softwares named CPro, Foxpro, Oracle (SQL), SPSS and Excel have been used for processing the survey data. CPro 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 was 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 been made 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 been filed for safe storage. A copy of the data set has been put forward to the survey authority for tabulation and analysis.

2.4 Tabulation:

Twelve tables focusing on the vital components such as total number of labours engaged in production of Aman, 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 in the part of analysis and annexure.

2.5 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 Aman have also been explained nationally.

2.6. 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 of the Survey

This chapter deals with the costs of factors of production related to Aman crop. The factors focussed are (i) land tenureship such as own, share cropping, mortgage, lease and others, (ii) labourer employed by phase such as land preparation, sowing, weeding, harvesting and thrashing, (iii) use of insecticides, fertilizer, plough, power tiller etc, (iv) leasing cost, (v) production cost and (vi) productivity etc.

3.1 Aman Producing households (HH)

This survey has dealt with the total of 24625 household across the country, out of which only 11307 HH were involved in Aman cultivation. Table 3.1 shows that only 45.92 percent HH at national level cultivate Aman which indicates that a moderate number of farmers grow Aman in Bangladesh.

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

Division	Total number				
	PSU	SSU	USU(HH)	HH having Aman	% of HH having Aman
1	2	3	4	5	6
Barisal	9	9	2250	1027	45.64
Chittagong	16	16	3625	1591	43.89
Dhaka	25	25	6250	2245	35.92
Khulna	16	16	4000	1928	48.20
Rajshahi	28	28	7000	3798	54.26
Sylhet	6	6	1500	718	47.87
Bangladesh	100	100	24625	11307	45.92

Distribution of sample and percentage of households having Aman cultivation by division are shown in table 3.1. It is observed that the lowest percentage (35.9%) of HHs in Dhaka division cultivates Aman and the highest 54.26 percent is in Rajshahi. Although there is no significant variation in Aman acreage among divisions, it is clear that Aman crop is cultivated all over the country.

3.2 Area:

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

(Area in acres.)

Division	Broadcast Aman		transplanted Aman						Combined Aman	
	Area	%	Local		HYV		Hybrid		Area	%
			Area	%	Area	%	Area	%		
1	2	3	4	5	6	7	8	9	10	11
Barisal	119	8.05	996	67.18	366	24.69	1	0.08	1483	100.00
Chittagong	257	14.52	740	41.86	769	43.51	2	0.11	1768	100.00
Dhaka	753	34.96	323	15.00	1074	49.89	3	0.15	2153	100.00
Khulna	140	8.21	287	16.84	1274	74.67	5	0.28	1707	100.00
Rajshahi	195	4.87	328	8.18	3479	86.79	6	0.16	4008	100.00
Sylhet	2	0.23	376	40.87	541	58.74	1	0.16	921	100.00
Bangladesh	1466	12.18	3051	25.34	7504	62.33	19	0.16	12040	100.00

Production cost survey for Aman crop was carried out in March, 2009. In this survey, data on area under Aman 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 costs were collected. Moreover, per acre production cost as well as per kilogram production cost were computed. It is observed from table 3.2 that area under Aman crop was 12.18%, 25.34%, 62.33%, and 0.16% for Broadcast, local transplanted, HYV, and hybrid respectively. As per BBS estimate (2008-09) Broadcast Aman 7.33%, Local transplant 25.35% and HYV 67.32%. It is to be noted here that area under hybrid Aman is highly insignificant. In cultivation of Aman crop, Rajshahi division covers large area (4008 acres) compared to other divisions. For HYV Aman also Rajshahi division achieves the highest percentage (86.79%). Survey data shows that insignificant area of Broadcast Aman are cultivated in Sylhet division.

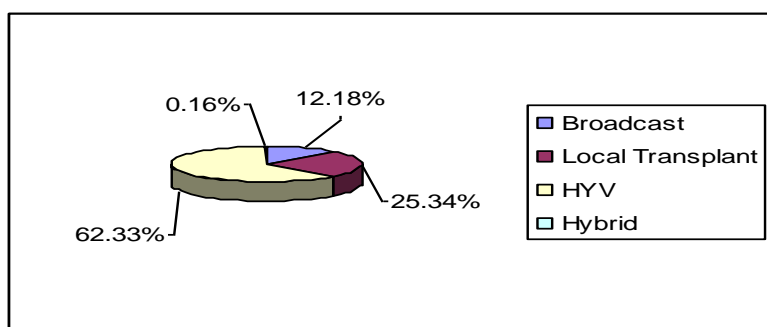


Figure 1. Area under Aman Crop (%) by Variety in Bangladesh

Figure 1 reveals that HYV Aman covers large area which is almost two-thirds of total area under Aman crop while a little over one-third area is planted by local variety Aman.

3.3 Land tenure:

Households growing Aman crop by type of land tenureship in percentage are shown below.

Table: 3.3(a). Percentages of area under Broadcast Aman by land tenureship by division.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
1	2	3	4	5	6	7
Barisal	79.01	11.42	0.62	8.33	0.62	100.00
Chittagong	76.19	8.06	3.30	12.33	0.12	100.00
Dhaka	54.95	28.13	9.90	6.60	0.42	100.00
Khulna	74.76	21.04	2.27	0.32	1.62	100.00
Rajshahi	65.64	8.55	16.91	4.36	4.55	100.00
Sylhet	33.33	0.00	0.00	66.67	0.00	100.00
Bangladesh	64.44	19.21	8.13	7.18	1.05	100.00

In Bangladesh, it is observed that slightly less than two-thirds of Broadcast Aman crop land is cultivated by owner himself/herself followed far behind by share cropping(19.2%). Barisal division experiences that almost four-fifth of farmers cultivate Broadcast Aman in their own lands. No crop sharing, mortgage and other systems prevail in Sylhet division while two thirds of Aman land is cultivated by lease system. On the other hand lease system is insignificant in Khulna. Cultivation of Broadcast Aman through mortgage and leasing system is far low at 8.1% and 7.2% respectively in the country. Broadcast Aman cultivation through sharecropping is significantly high in Dhaka (28.1%) and Khulna (21.0%) divisions and is high through mortgage system in Rajshahi division (16.9%). Owner cultivation of Broadcast Aman varies widely among division ranging from 33.3% in Sylhet to 79.0% in Barisal division.

Table: 3.3(b). Percentages of area under Local transplanted Aman by land tenure ship by division.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
Barisal	70.49	8.89	4.42	15.75	0.45	100.00
Chittagong	53.39	32.39	13.55	0.60	0.07	100.00
Dhaka	66.10	16.76	15.35	1.79	0.00	100.00
Khulna	64.10	19.07	4.17	8.17	4.49	100.00
Rajshahi	80.44	12.82	3.20	1.95	1.60	100.00
Sylhet	76.16	11.66	11.84	0.34	0.00	100.00
Bangladesh	67.47	16.79	8.57	6.37	0.80	100.00

Area under Local transplanted Aman by land tenure is shown in table 3.3(b). It is observed that the category of own land in land tenure strongly dominates Local transplanted Aman

cultivation. Both owner cultivation and share cropping are widely distributed among divisions. For Local transplanted Aman cultivation, it is seen that 67.47% of Aman crop land is cultivated by owner himself/herself while share cropping occupies by 16.8%.

Table: 3.3(c). Percentages of area under HYV Aman by land tenure ship by division.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
1	2	3	4	5	6	7
Barisal	61.89	17.51	4.65	15.88	0.08	100.00
Chittagong	50.46	31.88	2.05	15.20	0.41	100.00
Dhaka	75.33	13.15	10.77	0.36	0.39	100.00
Khulna	70.85	15.00	10.49	3.43	0.24	100.00
Rajshahi	77.17	10.26	7.08	4.46	1.04	100.00
Sylhet	74.52	19.32	5.89	0.17	0.09	100.00
Bangladesh	71.71	14.90	7.60	5.21	0.59	100.00

Data exhibited in table 3.3(c) give apparent idea about area under HYV Aman by land tenure. For HYV cultivation, it is seen that 71.71% of Aman crop land is cultivated by owner himself/herself followed by crop share (14.9%) at national level. Both these types of tenureship are evenly distributed between divisions. HYV Aman cultivation through mortgage and leasing system is prominent in 2 divisions Dhaka khulna and 2 divisions Barisal and Chittagong respectively .

Table: 3.3(d). Percentages of area under Hybrid Aman by land tenure ship by division.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
1	2	3	4	5	6	7
Barisal	62.50	0.00	0.00	37.50	0.00	100.00
Chittagong	20.00	0.00	0.00	80.00	0.00	100.00
Dhaka	30.00	30.00	0.00	40.00	0.00	100.00
Khulna	58.33	16.67	0.00	25.00	0.00	100.00
Rajshahi	68.75	6.25	12.50	12.50	0.00	100.00
Sylhet	33.33	0.00	0.00	66.67	0.00	100.00
Bangladesh	51.85	11.11	3.70	33.33	0.00	100.00

Area under hybrid Aman by land tenure is shown in table 3.3(d).For hybrid cultivation, it is seen that 51.85% of Aman crop land is cultivated by owner himself/herself followed by leasing system(33.3%) 80% and 20% of hybrid Aman land in Chittagong division is cultivated by lease and owner system respectively. No share cropping, mortgage and others system exists in Barisal, Chittagong and Sylhet. Mortgage system is observed only in Rajshahi division.

Table: 3.3(e). Percentages of area under Combined Aman by land tenure ship by division.

Division	Owner	Crop share	Mortgage	Lease	Others	Total
1	2	3	4	5	6	7
Barisal	68.18	12.16	4.15	15.18	0.33	100.00
Chittagong	56.49	27.28	6.04	9.95	0.24	100.00
Dhaka	67.20	18.54	11.28	2.65	0.33	100.00
Khulna	70.18	15.93	9.10	3.90	0.89	100.00
Rajshahi	76.78	10.39	7.30	4.23	1.30	100.00
Sylhet	74.93	16.70	7.86	0.46	0.06	100.00
Bangladesh	69.78	15.88	7.87	5.77	0.70	100.00

Table 3.3(e) provides the area under combined Aman by land tenure. It is observed that nearly 70.0% of households cultivated Aman paddy in their own lands followed by 16.9% share cropping, 7.9% mortgage, 5.8% lease and 0.70% others. In all divisions, owner system dominates over share cropping , mortgage, leasing and others systems.

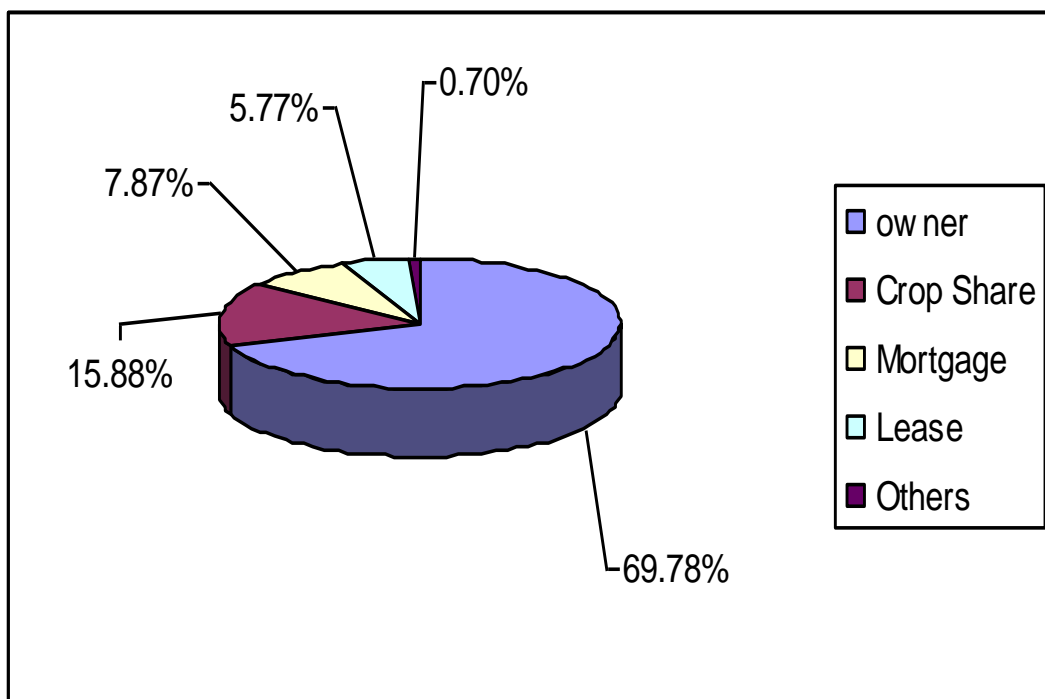


Figure 2. Percentage of household by land tenure.

3.4 Leasing:

Leasing means the land taken by the household for cultivation of Aman paddy only on payment of money to the land owner. Leasing price per acre is found to be significantly different across divisions and varieties.

Table: 3.4 Per acre leasing cost by division and by variety of Aman paddy.

(Fig. in Tk.)

Division	Broadcast Aman	transplanted Aman			Combined Aman
		Local	HYV	Hybrid	
1	2	3	4	5	6
Barisal	2670	3483	4151	4313	3649
Chittagong	3114	3865	4205	4442	3892
Dhaka	2568	3784	4117	4725	2736
Khulna	2700	3587	4195	4634	3990
Rajshahi	3051	3700	4163	4219	4058
Sylhet	2822	3442	4050	4242	3433
Bangladesh	2774	3509	4176	4499	3691

The average per acre leasing cost for Aman crop in Bangladesh is found at Tk. 3691. The costs are Tk.2774, Tk.3509, and Tk. 4176 and Tk 4499 for Broadcast Aman, Local transplanted Aman, HYV Aman and hybrid Aman respectively. No significant variations by division exist in HYV and hybrid Aman for leasing costs. While Broadcast Aman has the lowest average cost of Tk. 2774. The highest transplanted Aman has the highest average leasing cost of Tk. 4499/-.

3.5 Preparation of land :

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 tiller. 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 Aman paddy.

(Fig. in Tk.)

Division	Broadcast Aman	Transplanted Aman			Combined Aman
		Local	HYV	Hybrid	
1	2	3	4	5	6
Barisal	1262	1450	2345	2395	1657
Chittagong	1218	1473	2115	2053	1716
Dhaka	1402	1576	2134	1916	1794
Khulna	1217	1711	1944	2346	1846
Rajshahi	1315	1616	2044	2217	1974
Sylhet	1189	1582	1797	1936	1708
Bangladesh	1329	1528	2044	2170	1826

The average per acre land preparation cost for combined Aman crop in Bangladesh is recorded at Tk. 1826. Land preparation cost is the lowest at Tk 1329 for Broadcast Aman and is the highest at Tk.2170 for transplanted HYbrid Aman. Khulna and Rajshahi divisions spent more than average cost on land preparation compared to other four divisions. It is observed that in all divisions except Chitagong and Dhaka, land preparation cost is higher in Hybrid Aman compared to other varieties.

Table: 3.5(a). Per acre land preparation cost for Broadcast Aman paddy by division and by means of cultivation.

(Fig. in Tk.)

Division	Plough Tk.	Power tiller Tk.	Others Tk.	Total Tk.
1	2	3	4	5
Barisal	189	993	79	1262
Chittagong	66	1040	112	1218
Dhaka	63	1123	140	1402
Khulna	53	1053	111	1217
Rajshahi	52	1060	203	1315
Sylhet	76	1006	107	1189
Bangladesh	46	1147	136	1329

It is observed from the table 3.5(a) that the average per acre land preparation cost for Broadcast Aman crop in Bangladesh is Tk. 1329. A large portion (about 80%) of expenditure for land preparation goes to the mechanized power tiller in all divisions. Dhaka division spent more than national average cost on land preparation compared to other divisions.

Table:3.5(b) Per acre land preparation cost for Local transplanted Aman paddy by division and by means of cultivation.

(Fig. in Tk.)

Division	Plough Tk.	Power tiller Tk.	Others Tk.	Total Tk.
1	2	3	4	5
Barisal	296	1109	46	1450
Chittagong	46	1294	134	1473
Dhaka	134	1334	105	1576
Khulna	110	1510	91	1711
Rajshahi	201	1261	153	1616
Sylhet	357	1096	129	1582
Bangladesh	187	1241	99	1528

Table3.5(b) provides that the average per acre land preparation cost for Local transplanted Aman crop in Bangladesh is Tk. 1528. Most of the land under Local transplanted Aman is

cultivated by the mechanized power tiller (81%) while Barisal and Sylhet divisions experience traditional plough as well.

Table: 3.5(c). Per acre land preparation cost for HYV Aman paddy by division and by means of cultivation.

(Figures in Tk.)

Division	Plough Tk.	Power tiller Tk.	Others Tk.	Total Tk.
1	2	3	4	5
Barisal	367	1942	36	2345
Chittagong	336	1601	178	2115
Dhaka	220	1766	151	2134
Khulna	222	1496	225	1944
Rajshahi	360	1511	172	2044
Sylhet	677	895	225	1797
Bangladesh	309	1559	176	2044

It is apparent from the table 3.5(c) that the average per acre land preparation cost for HYV Aman crop in Bangladesh is Tk. 2044 and variation exists between divisions. From above data it is clear that all divisions except Dhaka and Khulna are still dependent on traditional plough system.

Table: 3.5(d) Per acre land preparation cost for Hybrid Aman paddy by division and by means of cultivation.

(Figures in Tk.)

Division	Plough Tk.	Power tiller Tk.	Others Tk.	Total Tk.
1	2	3	4	5
Barisal	403	1322	669	2395
Chittagong	526	1368	158	2053
Dhaka	602	1202	111	1916
Khulna	42	1618	686	2346
Rajshahi	306	1495	416	2217
Sylhet	0	1624	313	1936
Bangladesh	298	1460	412	2170

Table 3.5(d) depicts that per acre average land preparation cost is Tk 2170 and significant variations exists between divisions. It is seen that Barisal, Khulna and Rajshahi divisions spent more than average cost on land preparation for hybrid Aman. It is also mentionable that Sylhet divisions has no traditional system.

Table: 3.5(e). Per acre land preparation cost for combined Aman paddy by division and by means of cultivation.

(Figures in Tk.)

Division	Plough Tk.	Power tiller Tk.	Others Tk.	Total Tk.
1	2	3	4	5
Barisal	305	1305	47	1657
Chittagong	176	1391	150	1716
Dhaka	190	1440	140	1794
Khulna	189	1462	195	1846
Rajshahi	332	1469	173	1974
Sylhet	544	979	186	1708
Bangladesh	246	1428	152	1826

The table 3.5(e) gives an apparent picture of per acre land preparation cost for combined Aman paddy by division and by type of cultivation .It is found from the table that Tk 1826 is the average cost for per acre land preparation for combined Aman. All division except are still dependent on traditional plough system. ‘Others’ means sometimes farmers prepare lands by spades. At national level, percentage of land preparation cost by country plough, power tiller and others are 13.47%,78.20%and 8.32% respectively and it is evident that lions share of expenditure for land preparation goes to the mechanized power tilling system.

3.6 Seed:

Table: 3.6(a) Per acre seed used (in kg) and cost (in Tk) by division and varieties of Aman paddy.

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	KG	TK	KG	TK	KG	TK	KG	TK	KG	TK
1	2	3	4	5	6	7	8	9	10	11
Barisal	36.56	761.43	25.68	532.50	22.60	598.52	10.67	1066.67	26.41	567.31
Chittagong	36.13	750.92	21.78	450.65	19.74	522.63	14.55	1605.46	23.04	527.58
Dhaka	39.52	812.65	24.69	513.83	23.22	599.56	14.65	1590.91	30.13	675.18
Khulna	40.86	954.57	26.39	550.11	20.83	555.76	10.28	1074.77	24.50	612.07
Rajshahi	40.26	834.87	21.54	444.74	23.82	609.91	10.59	1074.77	24.75	609.75
Sylhet	33.33	677.33	20.67	416.49	23.60	605.90	10.00	1000.00	22.18	515.42
Bangladesh	39.09	821.99	23.39	483.10	22.71	588.63	11.61	1219.53	25.37	596.84

Per acre seed cost by variety of Aman paddy and by division is presented in table 3.6(a) The average seed requirement per acre is found 25.37 kilogram which costs Tk. 596.84.Per acre seed requirement for Broadcast Aman is much higher than that of Local transplanted, HYV and hybrid varieties. There is a small variation of per acre seed

requirement in Local transplanted Aman and HYV Aman. It is observed that per acre seed requiremen for hybrid Aman is very low but its cost is very high compared to other varieties.

Table: 3.6(b). No. of labour engaged and cost (in Tk) incurred for seed-bed preparation for per acre plantation by division and by varieties of Aman paddy.

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
1	2	3	4	5	6	7	8	9	10	11
Barisal	0.00	0	4.26	692	4.54	721	3.33	533	3.84	620
Chittagong	0.00	0	4.81	768	4.20	669	3.64	618	3.84	612
Dhaka	0.00	0	3.81	624	4.20	671	4.55	753	2.41	488
Khulna	0.00	0	5.41	867	4.75	764	2.34	346	4.19	673
Rajshahi	0.00	0	3.54	563	4.04	647	4.05	648	3.69	591
Sylhet	0.00	0	3.60	575	4.74	759	4.00	660	4.17	668
Bangladesh	0.00	0	4.24	683	4.28	684	3.91	628	3.61	579

It is unearthed from the table 3.6(b) that the average number of labourers required for per acre seed-bed preparation at national level is 3.61 and their cost is recorded at Tk. 579. Wide variation exists between divisions in the average number of labourers needed for seed-bed preparation for one acre plantation within the different varieties.

Table: 3.6(c). No. of labour engaged and cost (in Tk) incurred for plucking of seedlings for per acre plantation by division and by varieties of Aman paddy.

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
1	2	3	4	5	6	7	8	9	10	11
Barisal	0.00	0	5.71	848	8.02	1310	6.67	1000	5.43	823
Chittagong	0.00	0	4.70	696	6.60	1046	7.27	1091	4.81	741
Dhaka	0.00	0	5.54	794	6.56	1043	6.06	949	3.70	574
Khulna	0.00	0	4.51	652	7.48	1185	7.48	1215	5.95	933
Rajshahi	0.00	0	5.06	714	7.52	1237	8.41	1352	6.71	1091
Sylhet	0.00	0	3.74	561	6.71	1104	9.00	1000	5.25	837
Bangladesh	0.00	0	4.96	726	7.23	1172	7.61	1163	5.50	871

Number of labour engaged and cost incurred for plucking of seedlings for one acre plantation by divisions are exhibited in table 3.6(c). It is seen from the table that the average number of labour required for plucking of seedlings at national level is 5.50 and

their cost is recorded at Tk.871. It is also noticed that the highest number of labourers required in Rajshahi is 6.71 followed by Khulna division (5.95). The lowest number is in Dhaka division (3.70). The highest cost is seen in Rajshahi division. Wide variation exist between divisions in the number of labour required for plucking seedlings and also in the cost involved for the purpose.

Table: 3.6(d). Per acre no. of labour engaged and cost of sowing of seeds/planting of seedlings by division and by varieties of Aman paddy.

(Fig. in Tk.)

Division	Broadcast Aman		Transplanted Aman						Combined	
			Local		HYV		Hybrid			
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
1	2	3	4	5	6	7	8	9	10	11
Barisal	0.44	73	10.31	1654	10.89	1719	11.44	1534	9.63	1539
Chittagong	0.39	58	12.11	1731	12.84	2315	12.95	1958	10.80	1754
Dhaka	0.30	48	11.71	1620	13.31	2005	13.50	1832	8.50	1260
Khulna	0.80	117	10.38	1569	12.17	1791	12.55	1833	10.99	1624
Rajshahi	1.01	146	11.81	1385	10.80	1595	11.50	1520	10.41	1508
Sylhet	0.83	133	10.71	1641	10.81	1666	11.52	1783	10.75	1653
Bangladesh	0.47	71	11.11	1631	11.60	1772	12.18	1714	10.14	1531

It is evident from the table that the average number of labourer required for per acre sowing/planting of the crop at national level is 10.14 and their cost is recorded at Tk. 1531. No significant difference exists among cost of labourers of Local transplanted Aman , HYV and hybrid varieties but their vary divisions. In Broadcast Aman, less number of labourers are required for sowing of seeds. In case of transplantation of seedlings a good number of labourers are needed which is reflected in table 3.6(d) shown above

Table: 3.6(e). Per acre purchasing cost , other cost of seedling and selling of seedlings.

(Fig. in Tk.)

Division	Broadcast Aman			Transplanted Aman									Combined Aman		
				Local			HYV			Hybrid					
	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	Purchase cost	Others cost	Selling of seedling
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Barisal	0	0	0	207	63	92	281	80	21	0	0	0	195	59	72
Chittagong	0	0	0	72	50	90	257	163	253	545	227	55	140	91	145
Dhaka	0	0	0	401	30	338	563	149	481	0	0	0	304	68	259
Khulna	0	0	0	135	101	236	235	179	30	0	0	0	185	141	60
Rajshahi	0	0	0	83	89	49	287	114	43	62	75	62	244	103	41
Sylhet	0	0	0	183	102	10	247	167	56	0	0	0	215	134	33
Bangladesh	0	0	0	171	69	113	308	139	123	82	51	27	223	98	101

Table 3.6(e) shows per acre purchasing cost , other cost of seedling and selling of seedlings. At national level , per acre purchasing cost of seedling is Tk 223 and its other cost is 98. Others means the caring costs of seedlings. Sometimes additional seedlings are sold locally by the framers and in this case Tk 101 for per acre was recorded at national level.

3.7 Fertilizer:

Table: 3.7(a).Per acre qty. of fertilizer used (Kg) and value (Tk) for Broadcast Aman by division.

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others Tk	Total Tk
	Qty Kg)	valueTk	Qty(Kg)	valueTk	Qty(Kg)	valueTk	Qty(Kg)	valueTk	Qty(Kg)	valueTk	Qty Kg)	valueTk		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barisal	19.67	256	3.11	218	1.40	91	0.00	0	0.00	0	0.00	0	1	565
Chittagong	19.88	258	3.23	226	2.98	194	0.00	0	0.00	0	30.92	31	22	730
Dhaka	20.73	269	2.45	171	1.66	108	0.00	0	0.44	3	2.29	2	40	594
Khulna	27.68	360	3.27	239	2.52	164	0.05	5	1.81	8	26.16	26	28	830
Rajshahi	22.90	298	4.58	320	1.64	106	0.01	1	0.55	4	75.17	77	35	840
Sylhet	20.00	260	4.00	260	0.00	0	0.00	0	0.00	0	66.67	67	0	587
Bangladesh	21.24	276	3.14	220	1.98	129	0.01	1	0.40	2	23.78	24	31	682

Table 3.7(a) reveals from the data that at national level, the average per acre price of fertilizer for Broadcast Aman stands at Tk 682. Another name of this variety is deep water Aman paddy and it needs less quantity of fertilizer. Khulna division spends more on MoP ,TSP and Urea. Rajshahi division makes higher expenditure for organic compared to other divisions. Zinc is used in Khulna and Rajshahi divisions. No organic fertilizer users are found in places of Barisal.

Table: 3.7(b). Per acre qty. of fertilizer used (Kg) and price (Tk) for Local transplanted Aman by division.

(Fig. in Tk.)

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others Tk	Total Tk
	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	value Tk	Qty (Kg)	valueTk		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barisal	33.56	437	4.50	315	0.28	18	0.00	0	0.00	0	3.44	4	0	774
Chittagong	27.10	352	4.21	294	0.55	36	0.00	0	0.00	0	4.55	5	11	698
Dhaka	30.53	397	6.85	478	3.26	211	0.02	2	5.33	33	29.12	30	18	1169
Khulna	27.30	355	5.29	392	2.24	146	0.06	6	3.99	20	101.53	102	94	1114
Rajshahi	29.02	377	3.93	336	1.92	125	0.03	3	9.17	55	294.88	296	26	1218
Sylhet	37.77	491	3.14	220	0.45	29	0.00	0	0.00	0	28.59	29	29	798
Bangladesh	31.15	405	4.52	325	1.04	68	0.01	1	1.94	11	50.79	51	20	881

It appears from the table 3.7(b) that average per acre price of fertilizer for Local transplanted Aman stands at Tk 881. Normally urea is used for vegetative growth of the crop at growing stage and it is evident from the figures shown in the table. Two divisions Dhaka and Khulna spend more on TSP. Organic and zypsum fertilizer are used more in Rajshahi division. No zinc fertizer is used for Local transplanted Aman in Barishal, Chittagong and Sylhet divisions.

Table: 3.7(c). Per acre qty. of fertilizer used (Kg) and price (Tk) for HYV Aman by division.

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others Tk	Total 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		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barisal	54.15	710	15.89	1100	6.28	408	0.00	0	0.06	0	36.47	37	2	2257
Chittagong	49.57	597	16.66	1151	4.66	300	0.18	17	0.17	1	198.78	206	68	2341
Dhaka	61.20	753	16.05	1124	4.02	257	0.04	4	1.69	14	26.52	30	8	2189
Khulna	59.75	720	19.17	1323	9.85	638	1.90	205	29.65	147	72.19	72	142	3247
Rajshahi	59.56	740	19.35	1336	7.46	485	0.10	10	7.15	45	252.87	254	74	2943
Sylhet	52.21	680	19.17	1342	2.60	169	0.02	2	0.00	0	100.05	107	14	2313
Bangladesh	58.00	718	18.40	1274	6.68	433	0.39	42	8.60	48	163.29	165	67	2747

It is evident from the table 3.7(c) that per acre average use of urea, TSP, MOP, zinc, gypsum and organic for HYV Aman in Bangladesh are 58.00, 18.40, 6.68, 0.39, 8.60 and 163.29 kilograms respectively. In Bangladesh total cost for per acre usage of fertilizer for HYV Aman is Tk 2747 and it is also found that cost for TSP is higher in all divisions. Survey data shows that use of urea is more or less uniform in all divisions. Less use of Mop is observed in Sylhet division. As high as 252.87 Kg organic fertilizer is applied for per acre HYV Aman cultivation in Rajshahi followed by Chittagong (198.78kg). Use of TSP is also uniform in all divisions.

Table: 3.7(d). Per acre qty. of fertilizer used (Kg) and price (Tk) for Hybrid Aman by division

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others Tk	Total 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		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barisal	69.42	777	17.36	1215	9.09	591	0.00	0	0.00	0	0.00	0	124	2707
Chittagong	77.90	779	16.84	1179	0.00	0	0.00	0	0.00	0	184.21	184	116	2258
Dhaka	64.36	706	19.09	1336	4.55	286	0.00	0	4.55	30	0.00	0	136	2495
Khulna	64.61	907	17.44	1163	9.03	587	0.48	55	35.15	190	59.38	59	55	3017
Rajshahi	66.99	956	17.62	1240	9.26	602	0.00	0	18.34	107	306.05	344	134	3383
Sylhet	68.33	822	17.99	1259	0.00	0	0.00	0	0.00	0	34.72	35	153	2269
Bangladesh	67.59	864	17.69	1226	6.65	431	0.12	14	15.69	88	139.63	152	113	2887

Table 3.7(d) presents per acre qty. of fertilizer used (Kg) and its price (Tk) for Hybrid Aman .It reveals from the data that per acre average use of urea, TSP, MOP, zinc, gypsum and organic fertilizer for hybrid Aman in Bangladesh are 67.59,17.69,6.65,0.12,15.69 and 139.63 kilograms respectively. Survey data shows that cultivators do not use zinc for hybrid Aman in all divisions except Khulna division. In Sylhet and Chittagong, it is observed that only urea, TSP and organic are used for hybrid Aman. Farmers in Barisal,Dhaka and Rajshahi divisions do not use zinc and zipsum fertilizers.

Table: 3.7(e). Per acre qty. of fertilizer used (Kg) and price (Tk) for Combined Aman by division

Division	Urea		TSP		MOP		Zink		Zypsum		Organic		Others Tk	Total Tk
	Qty(Kg)	valueTk	Qty(Kg)	valueTk	Qty(Kg)	valueTk	Qty(Kg)	valueTk	Qty(Kg)	valueTk	Qty(Kg)	valueTk		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Barisal	37.88	494	7.29	507	1.87	122	0.00	0	0.02	0	11.53	12	1	1136
Chittagong	36.30	450	9.69	672	2.72	176	0.08	8	0.08	0	95.63	99	38	1443
Dhaka	46.17	575	11.20	783	3.33	214	0.03	3	2.03	14	21.13	23	18	1630
Khulna	52.94	644	16.16	1121	8.25	535	1.51	163	24.18	120	75.66	76	129	2787
Rajshahi	55.35	690	17.39	1206	6.73	438	0.09	9	7.02	44	248.04	249	68	2704
Sylhet	46.34	603	12.66	886	1.72	112	0.01	1	0.00	0	71.00	75	20	1698
Bangladesh	47.84	598	13.46	935	4.80	312	0.26	28	6.16	34	121.87	123	52	2083

It is observed from the table 3.7(e) that in Bangladesh, per acre average use of urea, TSP, MOP, zinc, gypsum and organic fertilizer for combined Aman are 47.84,13.46,4.80,0.26,6.16 and 121.87 kilograms respectively. It is also evident that per acre average cost for fertilizer is registered at Tk 2083. No zinc users are found for combined Aman in Barisal division.

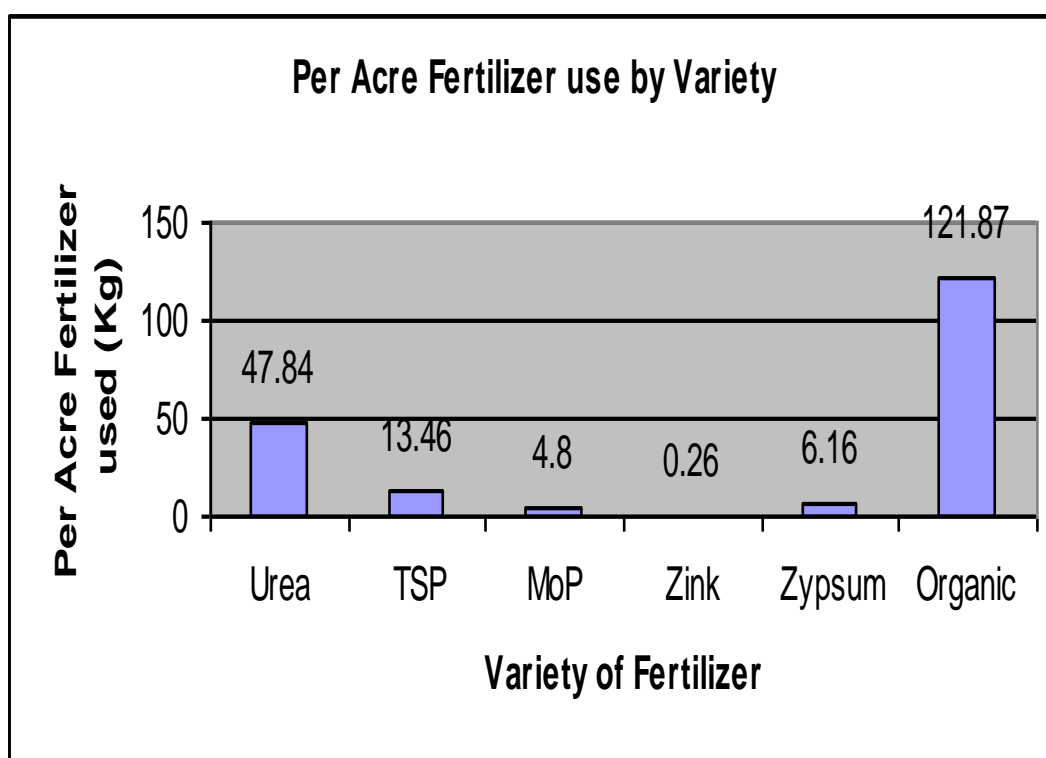


Figure 3. Per Acre Fertilizer use by Variety.

3.8 Pesticides, irrigation and other cost:

Table: 3.8(a). Per acre cost of pesticides, irrigation and other for Broadcast Aman paddy by division

(Fig. in Tk.)

Division	Pesticides	Irrigation	Others	Total
1	2	3	4	5
Barisal	273	0	45	318
Chittagong	223	0	135	358
Dhaka	192	0	7	199
Khulna	213	0	21	234
Rajshahi	264	0	110	374
Sylhet	133	0	27	160
Bangladesh	224	0	73	298

In table 3.8(a), it reveals from the data that per acre average insecticides/pesticides cost stands at Tk 224 while it is Tk 73 for other cost. Here it is to be mentioned that no irrigation is needed in Broadcast Aman.

Table: 3.8(b). Per acre cost of pesticides, irrigation and other for Local transplanted Aman paddy by division

(Fig. in Tk.)

Division	Pesticides	Irrigation	Others	Total
1	2	3	4	5
Barisal	381	0	75	456
Chittagong	377	13	8	398
Dhaka	322	147	136	606
Khulna	324	106	181	612
Rajshahi	278	169	48	495
Sylhet	258	0	29	287
Bangladesh	341	40	73	454

Table 3.8(b) contains per acre cost of insecticides/pesticides, irrigation and other costs for Local transplanted Aman paddy by division. It is evident from the table that Tk. 40 and Tk 341 are spent for irrigation and pesticides cost respectively at national level. Irrigation costs are remarkably low in Chittagong division. No irrigation costs are recorded in Barisal and Sylhet. Probably normal rainfall occurred in these places. Other costs are found higher in Khulna division.

Table: 3.8(c). Per acre cost of pesticides, irrigation and other for HYV Aman paddy by division.

(Fig. in Tk.)

Division	Pesticides	Irrigation	Others	Total
1	2	3	4	5
Barisal	417	0	53	470
Chittagong	440	155	38	634
Dhaka	342	311	21	674
Khulna	520	300	77	897
Rajshahi	418	325	108	851
Sylhet	370	0	24	395
Bangladesh	424	254	77	755

It is seen that Tk 254 and Tk424 are spent for irrigation and inscticides in case of HYV Aman cultivation. Insecticides/pesticides cost is seen to be the highest in Khulna division (520), followed by Chittagong (440) and lowest is seen in Dhaka(342). In Rajshahi (Tk. 418) insecticides costs are higher compared to Sylhet(370), Dhaka(342) and Barishal(417) divisions.

Table: 3.8(d). Per acre cost of pesticides, irrigation and other for hybrid Aman paddy by division.

(Fig. in Tk.)

Division	Pesticides	Irrigation	Others	Total
1	2	3	4	5
Barisal	516	681	0	1198
Chittagong	400	526	0	926
Dhaka	294	936	0	1229
Khulna	329	813	82	1224
Rajshahi	344	694	202	1239
Sylhet	526	0	44	570
Bangladesh	367	676	97	1139

Table 3.8(d) depicts that per acre cost for irrigation stands at Tk 676 and it is Tk 367 for pesticides. It is observed that Tk 97 is spent for other costs. The highest irrigation cost is Tk936 in Dhaka division followed by Tk 813 in Khulna division. No irrigation cost is seen in Sylhet division. Large variations are observed between divisions for the per acre cost of both pesticides and Irrigation.

Table: 3.8(e). Per acre cost of pesticides, irrigation and other for combined Aman paddy by division

(Fig. in Tk.)

Division	Pesticides	Irrigation	Others	Total
1	2	3	4	5
Barisal	391	0	68	460
Chittagong	409	104	34	547
Dhaka	328	266	36	629
Khulna	472	255	100	827
Rajshahi	409	314	106	829
Sylhet	332	0	26	358
Bangladesh	400	201	76	677

Data exhibited in Table 3.8(e) gives a general idea about per acre cost of insecticides/pesticides, irrigation cost and other costs of combined Aman .Here, it is observed that per acre average insecticide cost stands at Tk 400 while it is Tk 201 for irrigation cost. It is to be noted here that no irrigation cost is seen in Barisal and Syhlet division. ‘Others’ means some additional helping labourers needed for the application of insecticides/pesticides and irrigation. Wide variations exists between divisions in per acre cost of both pesticides and Irrigation.

3.9 Labourer(number and cost):

.Table: 3.9(a). Per acre no. of labourers engaged and cost of weeding by division and by varieties of Aman paddy.

(Fig. in Tk.)

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
1	2	3	4	5	6	7	8	9	10	11
Barisal	4.79	554	9.47	1839	12.37	1969	11.57	1488	9.79	1764
Chittagong	5.14	614	9.78	1413	11.74	1860	12.11	1974	10.00	1499
Dhaka	4.56	670	7.66	1135	10.67	1705	11.43	1623	8.08	1257
Khulna	5.97	652	9.02	1352	11.61	1857	9.50	1546	10.74	1679
Rajshahi	5.41	697	9.29	1392	11.95	1969	10.21	1618	11.41	1860
Sylhet	4.17	667	7.96	1194	9.77	1562	13.19	2208	9.03	1413
Bangladesh	4.92	653	9.11	1488	11.55	1872	10.76	1686	10.13	1627

Table no 3.9(a) contains per acre no. of labourers engaged and cost of weeding of Aman paddy. It is evident from the table that the average number of labour required for per acre weeding at national level is 10.13 and their cost is recorded at Tk. 1627.By variety, the highest number of labourers was engaged for HYV (11.55) followed by HYbrid (10.76) and local Aman (9.11).

Table: 3.9(b).Per acre of labour engaged and cost of harvesting by division and by varieties of Aman paddy.

(Fig. in Tk.)

Fig. 11.18.

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
1	2	3	4	5	6	7	8	9	10	11
Barisal	8.93	1429	11.32	1815	13.84	2229	10.74	1421	11.74	1883
Chittagong	11.43	1815	10.57	1584	11.88	1874	12.11	1837	11.26	1743
Dhaka	11.75	1880	11.68	1878	12.89	2061	11.43	1829	12.31	1969
Khulna	11.77	1882	12.75	1893	13.07	2072	10.21	1696	12.91	2026
Rajshahi	10.65	1703	10.61	1590	10.37	1636	13.04	1747	10.40	1635
Sylhet	10.00	1600	11.66	1749	13.85	2477	11.81	2000	12.95	2180
Bangladesh	11.31	1807	11.27	1740	11.76	1884	11.71	1751	11.58	1838

It is evident from table 3.9(b) that the average number of labourers required for per acre harvesting at national level is 11.58 and their cost is recorded at Tk.1838. There is no significant difference for cost of labourers among the varieties .The required no. of labourer for broadcast Aman in Chittagong, Dhaka and Khulna are almost the same.

Table: 3.9(c) Per acre no. of labourers engaged and cost of thrashing by division and by varieties of Aman paddy.

(Fig. in Tk.)

(Fig. in Tk.)

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
1	2	3	4	5	6	7	8	9	10	11
Barisal	4.07	651	4.89	733	5.58	899	6.61	909	4.99	767
Chittagong	5.50	880	5.43	938	8.21	1401	6.84	1095	6.66	1133
Dhaka	5.78	888	5.15	772	6.73	1088	6.29	886	6.16	970
Khulna	6.32	1074	5.63	844	8.12	1342	6.41	1017	7.56	1237
Rajshahi	5.16	785	5.60	871	8.07	1297	8.70	1371	7.73	1238
Sylhet	5.83	992	5.92	1003	4.90	781	6.25	1111	5.32	872
Bangladesh	5.55	870	5.32	846	7.55	1229	7.22	1130	6.75	1088

In table 3.9(c) it reveals from the data that the average number of labourers required for per acre thrashing at national level is 6.75 and their cost is recorded at Tk. 1088. The number of labourers recorded for Broadcast and transplanted Aman is almost the same. At the same time the number of labourers required for HYV and Hybrid Aman is almost equal.

Table: 3.9(d) Per acre other cost by division and by varieties of Aman paddy

(Fig. in Tk.)

Division	Broadcast Aman	Transplanted Aman			Combined Aman
		Local	HYV	Hybrid	
1	2	3	4	5	6
Barisal	118	58	63	45	64
Chittagong	120	17	226	26	123
Dhaka	137	29	101	234	103
Khulna	82	119	107	156	133
Rajshahi	149	99	134	245	137
Sylhet	0	116	126	35	121
Bangladesh	143	62	181	217	126

Table 3.9(d) depicts that per acre other cost for Aman cultivation stands at Tk. 126 in Bangladesh. Here other cost includes cost for cleaning paddy after thrashing and any other related cost not included in planting, weeding, harvesting and thrashing. It is noticed that per acre other costs is less (Tk62) for Local transplanted Aman compared to other varieties while hybrid is the highest(Tk 217).

3.10 Family and hired labourer(number and percentage):

Table:3.10(a). Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing Broadcast Aman 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			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barisal	0.00	0.00	0.05	0.39	3.06	1.73	2.21	6.72	2.23	1.84	18.23	7.54	41.39
Chittagong	0.00	0.00	0.10	0.28	2.17	2.97	2.08	9.35	4.60	0.91	22.46	8.95	39.84
Dhaka	0.00	0.00	0.12	0.18	1.83	2.74	1.45	10.30	1.46	4.32	22.40	4.87	21.73
Khulna	0.00	0.00	0.18	0.62	4.02	1.95	4.28	7.49	1.97	4.35	24.85	10.45	42.04
Rajshahi	0.00	0.00	0.01	1.01	2.83	2.58	2.66	7.98	2.77	2.39	22.23	8.27	37.18
Sylhet	0.00	0.00	0.83	0.00	2.17	0.00	3.17	4.17	2.00	0.00	20.83	7.34	35.34
Bangladesh	0.00	0.00	0.10	0.37	2.32	2.60	2.04	9.27	2.28	3.27	22.25	6.75	30.34

From table 3.10(a) it is evident that labourers are not required for Seed-bed preparation and Plucking of seedling for Broadcast Aman paddy, only seeds are sown. Data shows that 22.25 labourers are required for cultivation of Broadcast Aman paddy in different phases. Out of total labourers, 6.75 family labourers were engaged which represents 30.34% of the total labourers required. The table also shows that the highest 9.27 hired labourers were engaged for harvesting purposes followed by thrashing (3.27).

Table:3.10(b). Total number of labourers employed for per acre with phase-wise break-up and total number of family labourers involved in producing of Local transplanted Aman 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			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barisal	4.26	5.71	4.27	6.04	3.55	5.92	2.59	8.73	0.40	4.49	39.43	10.81	27.42
Chittagong	4.81	4.70	2.94	9.17	2.32	7.47	1.34	9.23	2.61	2.82	41.57	9.20	22.13
Dhaka	3.81	5.54	2.65	9.07	2.62	5.03	2.02	9.66	2.01	3.14	40.13	9.30	23.18
Khulna	5.41	4.51	1.98	8.40	2.44	6.59	1.80	10.95	2.29	3.34	41.56	8.50	20.45
Rajshahi	3.54	5.06	2.69	9.12	2.17	7.12	1.86	8.75	1.30	4.30	41.49	8.02	19.32
Sylhet	3.60	3.74	1.30	9.41	1.77	6.19	0.91	10.75	1.39	4.53	40.06	5.38	13.42
Bangladesh	4.24	4.96	3.03	8.09	2.68	6.43	1.87	9.41	1.50	3.82	40.52	9.08	22.39

Table 3.10(b) focuses on percentage of family labourers engaged in producing local transplanted Aman paddy by division and national level as well. It is evident from the table that percentage of family labourers involved in Local transplanted Aman production at national level is 22.39. Maximum percent (27.42) is found in Barisal division and minimum in Sylhet (13.42). The highest 9.41 hired labourers ---- engaged for harvesting followed by sowing/planting (8.09) and weeding (6.43).

Table:3.10© Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing of HYV Aman 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			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barisal	4.54	8.02	3.61	7.28	2.71	9.65	2.06	11.78	0.51	5.07	45.03	8.89	19.75
Chittagong	4.20	6.60	4.88	7.96	5.09	6.65	3.12	8.76	4.02	4.19	48.64	17.11	35.18
Dhaka	4.20	6.56	3.24	10.07	2.88	7.79	2.39	10.50	2.61	4.12	47.07	11.13	23.64
Khulna	4.75	7.48	2.79	9.39	2.99	8.62	2.13	10.94	3.53	4.59	49.38	11.44	23.16
Rajshahi	4.04	7.52	2.07	8.73	2.55	9.39	1.39	8.98	1.83	6.24	45.21	7.84	17.35
Sylhet	4.74	6.71	3.01	7.81	3.30	6.46	2.79	11.06	1.69	3.21	43.61	10.79	24.74
Bangladesh	4.28	7.23	2.79	8.81	3.00	8.55	1.97	9.79	2.38	5.17	46.40	10.14	21.85

Percentage of family labourers employed for per acre production of HYV Aman at national and divisional level is shown in table 3.10©. The table depicts that at national level the percentage of family labourer is 21.85%. the highest percentage (35.18%) is observed in Chittagong division and the lowest (17.35%) in Rajshahi division. The highest number of highest labourers (9.79) are engaged harvesting followed by sowing/planting(8.81) and weeding(8.55).

Table:3.10(d). Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing of Hybrid Aman 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			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barisal	3.33	6.67	5.79	1.65	7.44	4.13	8.26	2.48	0.00	6.61	38.84	21.49	55.32
Chittagong	3.64	7.27	6.32	2.63	6.32	5.79	4.21	7.90	4.74	2.11	46.32	21.58	46.59
Dhaka	4.55	6.06	1.14	7.43	1.14	10.29	0.57	10.86	1.14	5.14	49.71	4.00	8.05
Khulna	2.34	7.48	1.43	8.55	1.43	8.08	0.95	9.26	2.38	4.04	41.09	6.18	15.03
Rajshahi	4.05	8.41	2.46	7.37	1.70	8.51	1.51	11.53	0.76	7.94	49.34	6.43	13.03
Sylhet	6.00	9.00	3.47	3.47	12.50	0.69	0.00	11.81	0.00	6.25	48.61	15.97	32.86
Bangladesh	3.91	7.61	2.85	6.33	3.54	7.22	1.96	9.75	1.58	5.63	45.95	9.94	21.63

Table 3.10(d) shows the percentage of family labourer engaged in per acre hybrid Aman paddy production is 21.63%. It ranges from 8.05% to 55.32%. Minimum is seen in Dhaka division and maximum is in Barisal division. The highest number of hired labourer engaged is for harvesting (9.75) followed by seedling(7.61) and weeding (7.22).

Table:3.10(e) Total number of labourers employed per acre with phase-wise break-up and total number of family labourers involved in producing of combined Aman 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			
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Barisal	3.84	5.43	3.76	5.87	3.31	6.48	2.43	9.31	0.58	4.42	39.05	10.08	25.82
Chittagong	3.84	4.81	3.40	7.40	3.51	6.48	2.22	9.04	3.51	3.15	42.02	12.64	30.09
Dhaka	2.41	3.70	2.06	6.45	2.47	5.61	2.01	10.30	2.12	4.04	37.37	8.65	23.14
Khulna	4.19	5.95	2.45	8.55	2.97	7.77	2.23	10.67	3.20	4.36	46.16	10.85	23.51
Rajshahi	3.69	6.71	2.02	8.38	2.53	8.88	1.49	8.92	1.83	5.90	43.80	7.88	17.98
Sylhet	4.17	5.25	2.31	8.44	2.70	6.33	2.03	10.93	1.57	3.75	42.15	8.61	20.42
Bangladesh	3.61	5.50	2.53	7.61	2.84	7.29	1.95	9.63	2.15	4.60	42.01	9.46	22.52

Total number of labourers, family labourer and the percentage of family labourer, hired labourer required for per acre production of Aman paddy are exhibited in table 3.10(e). From this table it is clear that at national level, out of total 42.01 labourers, 9.46 are family labourers that represents 22.52 % 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(12.64) are engaged in Aman production in Chittagong division which represents 30.09% of the total labourers, whereas the lowest (7.88) is in Rajshahi, which represents 17.98% of the total. It is noticed that involvement of family labourers in production of Aman paddy in four divisions such as Dhaka(23.14%), Khulna(23.51%) and Sylhet(20.42%) are more or less close to national level (22.52%). The table also reveals that the highest number of hired labour (9.63) is engaged in harvesting followed by sowing/planting (7.61) and weeding (7.29).

3.11. Production cost:

Table: 3.11(a). Per acre production cost (in Tk.) for Aman cultivation by components and by division, 2008-09.

Division	Leasing	Land preparation	Seeds	Seed-bed preparation	Plucking of seedlings	Purchasing of seedlings	Planting	Irrigation	Fertilizer	Weeding	insecticides	harvesting	Thrashing	others	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Barisal	3649	1657	567	620	823	254	1539	-	1136	1764	391	1883	767	132	15183
Chittagong	3892	1716	528	612	741	231	1754	104	1443	1499	409	1743	1133	157	15961
Dhaka	2736	1794	675	488	574	372	1260	266	1630	1257	328	1969	970	139	14458
Khulna	3900	1846	612	673	933	326	1624	255	2787	1679	472	2026	1237	233	18693
Rajshahi	4058	1974	610	591	1091	347	1508	314	2704	1860	409	1635	1238	243	18580
Sylhet	3433	1708	515	668	837	349	1653	-	1698	1413	332	2180	872	147	15805
Bangladesh	3691	1826	597	579	871	321	1531	201	2083	1627	400	1838	1088	197	16850
Percentage(%)	21.87	10.82	4.00	3.54	5.16	1.90	9.07	1.19	12.34	9.64	2.37	10.88	6.45	1.74	100

Per acre production cost (Tk.) by phase is presented in table 3.11. Out of total cost, 21.87% is spent for leasing followed by harvesting 10.88%. Share of land preparation cost, fertilizer and weeding are 10.82%, 12.34% and 9.64% respectively. Seed-bed preparation, plucking of seedlings, sowing/planting, weeding, harvesting and thrashing works are done by labourers and expenses under these components are practically labourers wages. Of the total cost, labourers wages represent 46.94%. Others means the wages of some additional labourers employed at different components. All costs (Component-wise) for Aman cultivation in terms of percentage (%) are shown in the pi-chart below:

Percentage of Per Acre Cost of Aman Production by Components

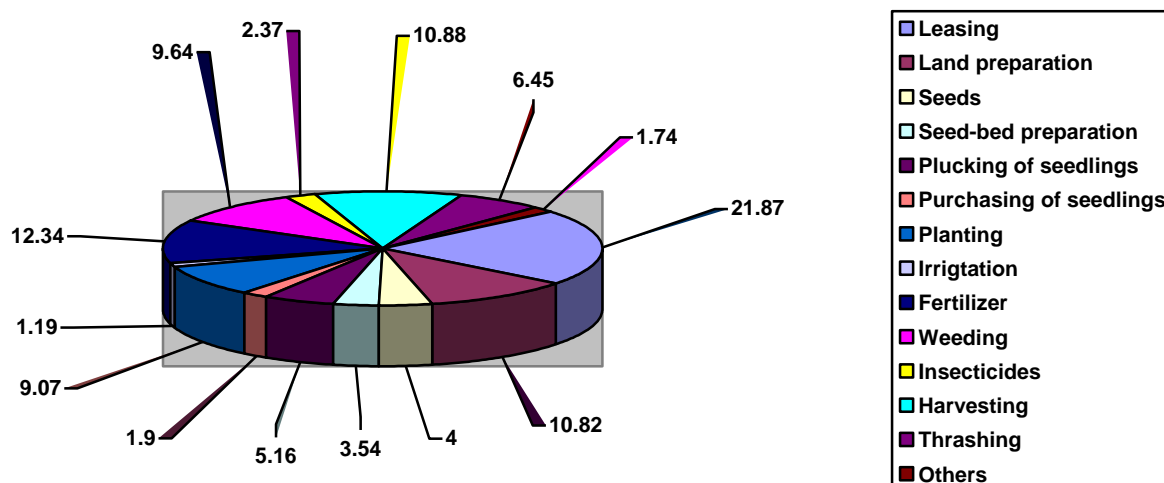


Figure: 4 Percentage of Per Acre Cost of Aman Production by Components

Table: 3.11(b). Per acre production cost (Tk) of Aman paddy by varieties and by division
(Fig. in Tk.)

Division	Broadcast Aman	Transplanted Aman			Combined Aman
		Local transplanted	HYV	Hybrid	
1	2	3	4	5	6
Barisal	8401	14605	19093	17709	15183
Chittagong	9658	14154	19629	20051	15961
Dhaka	9200	14932	19098	19593	14458
Khulna	9742	15104	20671	19900	18683
Rajshahi	9996	14260	19526	20551	18580
Sylhet	8827	13651	18051	18408	15805
Bangladesh	9448	14270	19552	19926	16850

The average per acre production cost of Aman crop in Bangladesh is recorded at Tk. 16876. Per acre production cost of Aman crop in Sylhet division is more than average cost compared to other divisions.

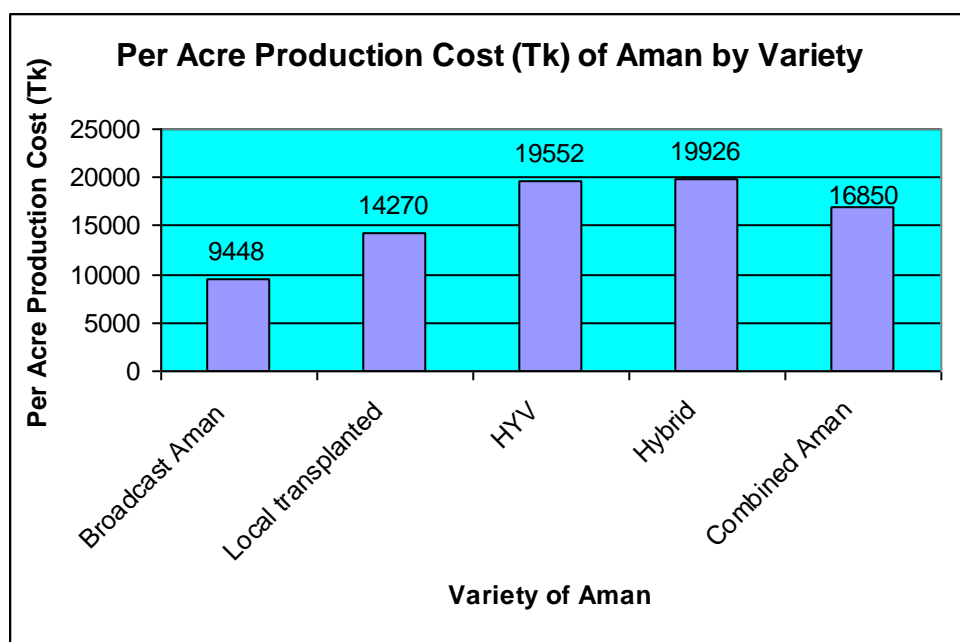


Figure 5. Per Acre Production Cost (Tk) of Aman by Variety .

Figure 6 exposes that per acre production cost of hybrid Aman is the highest (Tk19926) followed by HYV (Tk19552). Per acre cost of HYV and Hybrid is almost double than that of broadcast variety.

Table: 3.11(c). Per KG production cost (Tk) of Aman paddy by div. and by varieties.

Division	Broadcast Aman	Transplanted Aman			Combined Aman
		Local transplanted	HYV	Hybrid	
1	2	3	4	5	6
Barisal	11.41	15.47	10.99	7.76	14.32
Chittagong	14.72	14.92	10.78	10.82	12.51
Dhaka	14.21	14.72	11.63	10.17	12.04
Khulna	13.38	17.43	12.86	10.29	13.49
Rajshahi	13.23	13.88	12.02	10.41	12.13
Sylhet	11.82	12.67	10.97	14.10	11.32
Bangladesh	13.93	14.70	11.84	10.45	12.52

It is seen from table 3.21 that per kilogram production cost of Aman crop in Bangladesh is recorded at Tk.12.52. The highest cost is seen in Barisal division (Tk.14.32) followed by Khulna division (Tk.13.49). Among the six divisions Sylhet registers the lowest cost (Tk 11.32). By variety, the HYbrid Aman costed the lowest of Tk.10.45 and local transplanted Aman costed the highest Tk.14.70 per Kg.

3.12 Production and value:

Table: 3.12(a). Per acre production (maund*) and value (Tk) of Aman paddy by div. and by varieties.

(Fig. in Tk.)

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	Maund	Value	Maund	value	Maund	value	Maund	value	Maund	value
1	2	3	4	5	6	7	8	9	10	11
Barisal	18.41	10311	23.61	13459	43.44	25648	57.03	33636	28.08	16209
Chittagong	16.40	9699	23.71	13523	45.51	27084	46.32	27789	32.28	18954
Dhaka	16.19	9969	25.37	16149	41.04	24326	48.18	28682	29.92	18032
Khulna	18.21	11012	21.66	13493	40.20	23982	48.34	28610	35.41	21234
Rajshahi	18.89	10598	25.69	15210	40.63	24192	49.34	29565	38.37	22808
Sylhet	18.67	10453	26.94	15724	41.13	24569	32.64	21875	35.31	20946
Bangladesh	16.95	10130	24.27	14230	41.29	24572	47.66	28612	34.05	20215

* 1 maund = 40Kilograms

It is seen from table 3.12 that per acre average yield rate of Aman crop is 34.05 maund and its Value is recorded at Tk. 20215. The highest yield rate is achieved in Rajshahi division (38.4 maunds) while Barisal division witnessed the lowest one (28.1 maund). By variety, the HYbrid Aman has the highest production of 47.7 maunds per acre followed by HYV Aman (41.3 maunds). Production of other two variations viz.. local Aman and Broadcast Aman are far low at 24 maunds and 17 maunds respectively.

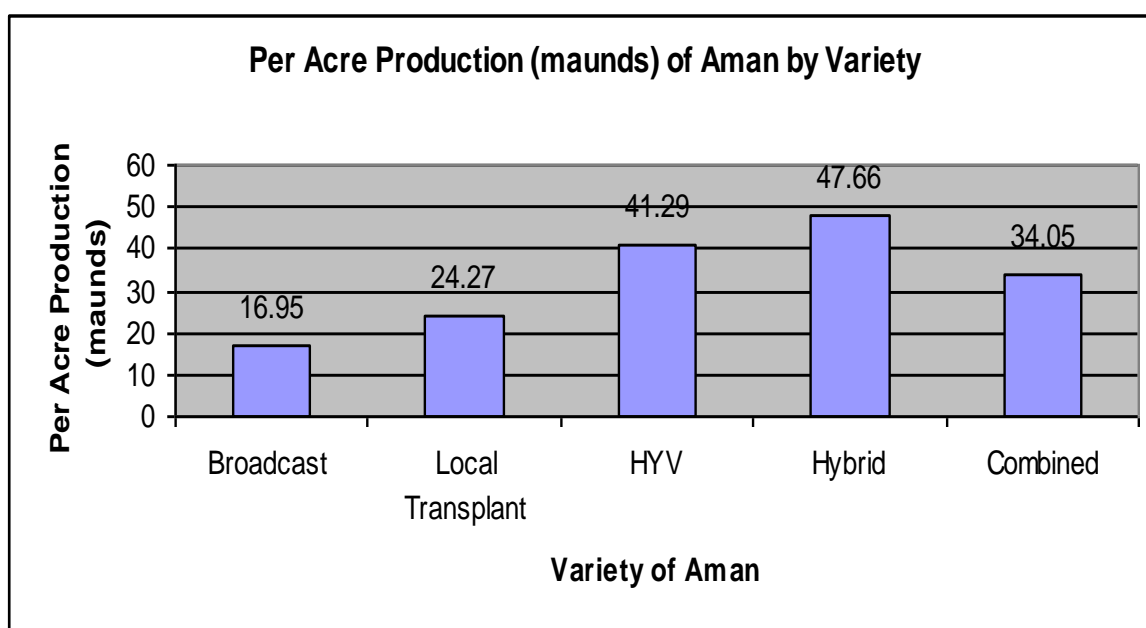


Figure 6. Per Acre Production (maunds) of Aman by Variety.

From the figure 6 it is crystal clear that Hybrid Aman tops the list of yield rates of four varieties.

Table: 3.12(b). Per acre production (maund) and value (Tk) of by-product by varieties and by division.

(Fig. in Tk.)

Division	Broadcast Aman		Transplanted Aman						Combined Aman	
			Local		HYV		Hybrid			
	Maund	Value	Maund	value	Maund	value	Maund	value	Maund	value
1	2	3	4	5	6	7	8	9	10	11
Barisal	13.38	796	10.84	647	13.26	779	14.88	893	11.65	691
Chittagong	14.38	990	11.18	767	10.58	735	12.11	847	11.36	784
Dhaka	13.55	931	11.66	805	12.83	889	16.82	649	12.92	891
Khulna	14.70	882	10.44	626	12.45	746	14.37	739	12.28	736
Rajshahi	13.44	806	11.94	716	10.22	612	11.53	692	10.52	630
Sylhet	13.33	800	12.84	771	11.37	681	11.81	708	11.97	718
Bangladesh	13.76	908	11.34	714	11.23	699	13.32	733	11.57	728

Table 3.12(b) reveals that per acre average by-product of Aman crop at national level is 11.57 maund for which Value is Tk.728. The highest (12.92 mnds) per acre production is seen in Dhaka, and the lowest in Rajshahi (10.52 mnds). By variety, the Broadcast Aman has the highest production of 13.76 maunds followed closely by HYbrid Aman 13.32 maunds. Production for the other two varieties are lower at 11.34 maunds for local Aman and 11.23 maunds for HYV Aman.

3.13 Productivity:

Table: 3.13. Productivity of Aman paddy per acre by division, 2008-09.

Division	Total production cost per acre (Tk.)	Total farmgate value per acre (Tk.)			productivity
		Paddy	Straw	Total	
1	2	3	4	5	6
Barisal	15183	16209	691	16900	1.11
Chittagong	15961	18954	784	19738	1.24
Dhaka	14458	18032	891	18923	1.31
Khulna	18693	21234	736	21970	1.18
Rajshahi	18580	22808	630	23438	1.26
Sylhet	15805	20946	718	21664	1.37
Bangladesh	16850	20215	728	20943	1.24

Table 3.13 reflects the productivity of Aman paddy by division and at national level as well. It is the most important factor of production, because it determines whether producers will continue the production of the crop. If it is greater than one, it means that the producer becomes benefited and he will be interested to continue the production of the crop; and if it is less than one, he will quit the production of the crop. It is seen from the above table that the productivity of Aman at national level is 1.24, which means that

farmers get some profit from the production of Aman. Highest productivity (1.37) is observed in Sylhet division. Lowest productivity (1.11) is recorded in Barisal division.

3.14: By size of land planted all (Aman):

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

Table-3.14(a): Distribution of per decimal production cost (excluding leasing) by size of land planted for Aman crop 2008-09.

(Fig. in Tk.)

Size of land planted (acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	37.81	37.90	24.86	12.29	81.64	194.49
0.05 – 0.49	28.34	32.86	21.91	10.35	68.68	162.13
0.50 – 0.99	22.15	19.06	21.54	8.23	67.14	138.12
1.00 – 1.49	18.98	14.30	21.05	7.09	63.72	125.14
1.50 – 2.49	16.44	12.44	20.51	5.78	62.14	117.30
2.50 – 4.99	12.93	7.66	21.01	4.92	56.97	103.49
5.00 – 7.49	10.56	6.52	19.24	4.61	53.05	93.98
7.50+	8.85	5.59	12.69	4.85	41.88	73.86
Total	18.26	23.71	20.82	6.78	62.33	131.90

It is noticed in the table 3.14(a) that per decimal total production costs (excluding leasing value) for land preparation, seeds, fertilizer and pesticides are TK 18.26, Tk 23.71, Tk 20.82 and Tk 6.78 respectively. Others cost is Tk 62.33 which represent 47.25% of the total cost. The table further exposes that per decimal production cost increases for all components if land size decreases.

Table 3.14(b): Distribution of per decimal production cost (excluding leasing) by size of land planted and tenure ship for Aman crop 2008-09.

Size of land planted (acres)	Tenure ship					All
	Own	Share	Mortgage	Lease	Others	
<= 0.04	194.32	194.56	-	-	-	194.49
0.05 – 0.49	165.56	157.32	157.30	175.26	144.94	162.13
0.50 – 0.99	141.01	130.79	135.15	125.91	131.14	138.12
1.00 – 1.49	126.40	118.86	126.88	125.77	120.07	125.14
1.50 – 2.49	120.25	107.53	113.05	115.07	111.02	117.30
2.50 – 4.99	107.04	95.61	95.57	94.74	91.00	103.49
5.00 – 7.49	97.85	82.59	86.96	85.01	77.11	93.98
7.50 +	81.06	67.27	-	-	68.90	73.86
Total	134.24	125.90	136.00	115.35	120.62	131.90

The table clearly exposes that per decimal production cost is higher where the land size of Aman cultivation is lower and the picture is true for all types of tenureship of land . In the mortgage and lease lands, Aman cultivation was found nil in the size class of ≤ 0.04 and 7.50+ acres .In case of others system of tenureship , no land under Aman cultivation was observed in the size class of ≤ 0.04 acres.

Table 3.14(c): Distribution of per decimal production cost (excluding leasing) by varieties and size of land planted for Aman crop 2008-09.

(in Taka)

Size of land planted (acres)	Variety			All
	Broadcast	Local Transplanted	HYV/Hybrid	
≤ 0.04	-	192.38	197.62	194.49
0.05 – 0.49	81.78	152.25	184.79	162.13
0.50 – 0.99	69.44	119.06	156.57	138.12
1.00 – 1.49	64.23	104.69	143.68	125.14
1.50 – 2.49	60.27	96.08	137.01	117.30
2.50 – 4.99	51.77	84.22	119.26	103.49
5.00 – 7.49	41.66	76.93	111.88	93.98
7.50 +	40.94	56.75	96.10	73.86
Total	66.74	107.60	153.81	131.90

Per decimal production costs of broadcast Aman, Local transplant Aman and HYV + Hybrid Aman are Tk 66.74,Tk 107.60 and Tk 153.81 respectively and for all varieties combined it is Tk 131.90. The table exposes that farmers of low land size of Aman cultivation invested more money for getting better harvest and the scenario is common for all the varieties.

Table-3.14(d): Distribution of per decimal production value by varieties and size of land planted for Aman crop 2008-09.

(Fig. in Tk)

Size of land planted (acres)	Product Value	By Product Value	Total value
1	2	3	4
≤ 0.04	254.21	11.58	265.79
0.05 – 0.49	204.78	8.86	213.64
0.50 – 0.99	207.61	7.88	215.49
1.00 – 1.49	209.11	7.31	216.42
1.50 – 2.49	203.42	7.06	210.47
2.50 – 4.99	197.29	6.53	203.82
5.00 – 7.49	182.78	5.91	188.69
7.50+	159.07	5.46	164.53
Total	202.15	7.28	209.43

The table 3.14(d) focuses that per decimal total production value for total land is Tk 209.43. In this case also it is noticed that per decimal production value is observed higher where land size is lower and it is due to farmer's more care to the land for getting better yield.

Table 3.14(e): Distribution of per decimal production value by size of land planted and tenureship for Aman crop 2008-09.

Size of land planted (acres)	Tenure ship					All
	Own	Share	Mortgage	Lease	Others	
<= 0.04	268.89	210.00	-	-	-	265.79
0.05 – 0.49	218.10	197.19	205.35	253.28	225.08	213.64
0.50 – 0.99	217.29	208.09	214.82	195.68	221.05	215.49
1.00 – 1.49	217.69	206.42	222.61	241.76	225.15	216.42
1.50 – 2.49	216.35	191.56	196.97	229.13	207.15	210.47
2.50 – 4.99	211.61	180.47	181.71	252.81	169.07	203.82
5.00 – 7.49	195.33	155.24	156.97	155.66	224.84	188.69
7.50 +	167.76	158.37	-	-	160.35	164.35
Total	213.45	194.99	206.34	212.51	207.89	209.43

The table focuses that per decimal production value of own land is higher where land size under Aman is lower. But some fluctuating values are seen in the lands under share cropping, mortgage, lease and others.

Table 3.14(f): Distribution of per decimal production value by size of land planted and varieties for Aman crop 2008-09.

(in Tk.)

Size of land planted (acres)	Variety			All
	Broadcast	Local Transplanted	HYV/Hybrid	
<= 0.04	-	243.53	298.70	265.79
0.05 – 0.49	124.17	177.19	252.12	213.64
0.50 – 0.99	119.18	159.97	252.88	215.49
1.00 – 1.49	111.64	155.12	258.50	216.42
1.50 – 2.49	108.47	147.96	258.24	210.47
2.50 – 4.99	93.69	135.41	247.15	203.82
5.00 – 7.49	64.88	138.02	234.73	188.69
7.50 +	80.86	117.23	232.38	164.53
Total	110.38	149.44	252.80	209.43

Per decimal production value of broadcast variety is found higher when the land under cultivation is lower. With the increase of land size the production value shows declining trend. But some exceptions are observed in case of local transplanted and HYV+ Hybrid varieties.

3.15 Sampling Error and data reliability:

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

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

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

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

K = the number of random group

Table-3.15(a): Estimated average production cost (excluding leasing) per kg for the 2008-09 variety wise Aman crops and their standard errors

Variety of Aman	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
Broad cast	9.84	0.17821	1.96	0.05152	1.21	0.01581	1.01	0.05728	0.44	0.01920	5.22	0.16927
L.transplanted	11.08	0.12182	1.57	0.05285	2.20	0.07173	0.91	0.05705	0.47	0.01765	5.93	0.07893
HYV & Hybrid	8.95	0.05842	1.26	0.01180	1.32	0.09832	1.68	0.02292	0.54	0.00685	4.23	0.04265
Aman	9.68	0.04422	1.34	0.02602	1.74	0.06467	1.53	0.01870	0.50	0.00893	4.57	0.03791

From the above table the average production cost per kg for local broad cast Aman of 9.84 taka is not significantly different from the 11.08 taka average production cost for local transplanted Aman crops at 95% confidence level. The average production cost per kg of local broad cast Aman of 9.84 taka is not significantly different from the 8.95 taka average production cost for HYV/Hybrid Aman crops at 95% confidence level.

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

Table-3.15(b): Estimated average production cost (excluding leasing) per decimal for the 2008-09 variety wise Aman crops and their standard errors

Variety of Aman	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
Broad cast	66.74	0.24957	13.27	0.15192	8.82	0.14758	6.82	0.31703	2.98	0.26651	34.43	0.20314
L.Trans planted	107.61	0.74362	15.28	0.28310	21.32	0.35915	8.81	0.25028	4.54	0.05668	57.67	0.63091
HYV & Hybrid	153.77	0.98799	20.44	0.16102	28.93	0.46526	27.48	0.13008	7.56	0.05773	69.36	1.04754
Aman	131.85	0.34985	18.26	0.17222	23.68	0.31864	20.83	0.13105	6.77	0.11665	62.31	0.52131

The average production cost per decimal for local broad cast Aman of 66.74 taka is significantly different from the 107.61 taka average production cost for local transplanted Aman crops at 95% confidence level. Similarly the average production cost per kg of local broad cast Aman of 66.74 taka is significantly different from the 153.77 taka average production cost for HYV/Hybrid Aman crops at 95% confidence level.

However the estimated production cost per decimal for local transplanted and HYV/Hybrid production cost were subject to higher standard errors than for local broadcast Aman crop. Production cost for all estimated 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) and by component for Aman, 2008-09.

(Fig. in Tk.)

Size of land planted (Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	37.81	37.90	24.86	12.29	81.64	194.49
0.05 – 0.49	28.34	32.86	21.91	10.35	68.68	162.13
0.50 – 0.99	22.15	19.06	21.54	8.23	67.14	138.12
1.00 – 1.49	18.98	14.30	21.05	7.09	63.72	125.14
1.50 – 2.49	16.44	12.44	20.51	5.78	62.14	117.30
2.50 – 4.99	12.93	7.66	21.01	4.92	56.97	103.49
5.00 – 7.49	10.56	6.52	19.24	4.61	53.05	93.98
7.50+	8.85	5.59	12.69	4.85	41.88	73.86
Total	18.26	23.71	20.82	6.78	62.33	131.90

Table-4.2 Distribution of per decimal production value by Size of land planted (Acres) for Aman crop 2008-09 .

(Fig. in Tk)

Size of land Planted (Acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	254.21	11.58	265.79
0.05 – 0.49	204.78	8.86	213.64
0.50 – 0.99	207.61	7.88	215.49
1.00 – 1.49	209.11	7.31	216.42
1.50 – 2.49	203.42	7.06	210.47
2.50 – 4.99	197.29	6.53	203.82
5.00 – 7.49	182.78	5.91	188.69
7.50+	159.07	5.46	164.53
Total	202.15	7.28	209.43

Table-4.3: Distribution of per decimal production cost (excluding leasing) of own land by Size of land planted (Acres) for Aman crop, 2008-09.

Size of land planted (Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	37.88	39.17	24.50	12.97	79.80	194.32
0.05 – 0.49	28.71	34.73	21.61	11.02	69.50	165.56
0.50 – 0.99	22.10	20.66	21.93	8.59	67.73	141.01
1.00 – 1.49	18.94	15.25	21.34	7.33	63.54	126.40
1.50 – 2.49	16.67	13.88	20.94	5.94	62.82	120.25
2.50 – 4.99	13.13	8.74	22.33	5.07	57.77	107.04
5.00 – 7.49	10.97	7.37	20.82	4.78	53.90	97.85
7.50+	8.64	7.00	16.69	5.41	43.33	81.06
Total	18.08	25.16	21.44	6.93	62.62	134.24

Table-4.4: Distribution of per decimal production value of own land by Size of land planted(Acres) for Aman crop 2008-09.

(Fig. in Tk)

Size of land Planted (Acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	257.22	11.67	268.89
0.05 – 0.49	208.55	9.55	218.10
0.50 – 0.99	209.06	8.24	217.29
1.00 – 1.49	210.30	7.40	217.69
1.50 – 2.49	209.28	7.07	216.35
2.50 – 4.99	205.12	6.49	211.61
5.00 – 7.49	189.34	5.99	195.33
7.50+	162.51	5.25	167.76
Total	206.06	7.39	213.45

Table-4.5: Distribution of per decimal production cost (excluding leasing) of land under crop sharing by Size of land planted (Acres for Aman crop 2008-09 .

Size of land planted (Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	36.67	25.56	30.67	5.00	96.67	194.56
0.05 – 0.49	28.09	30.46	22.48	7.49	68.80	157.32
0.50 – 0.99	21.93	15.76	20.51	6.45	66.14	130.79
1.00 – 1.49	18.83	10.84	20.51	5.55	63.13	118.86
1.50 – 2.49	15.46	7.44	20.51	4.91	59.22	107.53
2.50 – 4.99	11.83	6.42	15.23	3.72	58.43	95.61
5.00 – 7.49	9.36	4.77	12.43	4.12	51.90	82.59
7.50+	9.53	5.00	10.86	2.32	39.56	67.27
Total	18.02	21.75	19.07	5.45	61.62	125.90

Table-4.6: Distribution of per decimal production value of land under crop sharing by Size of land planted (Acres for Aman cro 2008-09.

(Fig. in Tk)

Size of land Planted (Acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	200.00	10.00	210.00
0.05 – 0.49	189.48	7.70	197.19
0.50 – 0.99	201.23	6.86	208.09
1.00 – 1.49	199.40	7.02	206.42
1.50 – 2.49	184.77	6.79	191.56
2.50 - 4.99	174.35	6.12	180.47
5.00 – 7.49	149.79	5.45	155.24
7.50+	152.01	6.36	158.37
Total	188.19	6.80	194.99

Table-4.7: Distribution of per decimal production cost (excluding leasing) of land under mortgage by Size of land planted (Acres for Aman cro 2008-09p.

Size of land planted (Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.05 – 0.49	28.61	28.08	22.65	12.49	65.46	157.30
0.50 – 0.99	21.87	15.30	21.19	10.21	66.59	135.15
1.00 – 1.49	20.10	8.50	21.64	9.94	66.70	126.88
1.50 – 2.49	17.57	10.29	17.96	7.42	59.81	113.05
2.50 – 4.99	13.29	9.00	18.77	5.02	49.49	95.57
5.00 – 7.49	12.04	8.00	13.25	5.00	48.67	86.96
7.50+	0.00	0.00	0.00	0.00	0.00	0.00
Total	21.04	22.33	20.50	9.30	62.84	136.00

Table-4.8: Distribution of per decimal production value of land under mortgage by Size of land planted (Acres for Aman 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	197.75	7.59	205.35
0.50 – 0.99	207.59	7.23	214.82
1.00 – 1.49	215.99	6.61	222.61
1.50 – 2.49	190.42	6.55	196.97
2.50 - 4.99	175.64	6.06	181.71
5.00 – 7.49	150.89	6.07	156.97
7.50+	0.00	0.00	0.00
Total	199.44	6.89	206.34

Table-4.9: Distribution of per decimal production cost (excluding leasing) of land under land others by Size of land planted (Acres for Aman crop 2008-09.

Size of land planted(Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.05 – 0.49	24.94	24.90	21.91	8.03	65.16	144.94
0.50 – 0.99	23.57	14.27	21.02	6.96	65.32	131.14
1.00 – 1.49	19.41	11.98	18.31	6.52	63.84	120.07
1.50 – 2.49	15.71	7.86	17.28	5.01	65.17	111.02
2.50 – 4.99	12.07	4.56	17.99	5.59	50.79	91.00
5.00 – 7.49	6.67	5.00	6.97	2.22	56.26	77.11
7.50+	8.68	4.44	6.79	3.55	55.43	68.90
Total	18.32	16.00	18.48	6.02	61.80	120.62

Table-4.10: Distribution of per decimal production value of land under land others by Size of land planted (Acres) for Aman 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	217.09	7.99	225.08
0.50 – 0.99	212.62	8.43	221.05
1.00 – 1.49	217.12	8.03	225.15
1.50 – 2.49	199.21	7.95	207.15
2.50 - 4.99	160.13	8.94	169.07
5.00 – 7.49	215.11	9.73	224.84
7.50+	155.95	4.40	160.35
Total	199.70	8.19	207.89

Table-4.11: Distribution of per decimal production cost (excluding leasing) of land under land lease by Size of land planted (Acres) for Aman crop 2008-09.

Size of land planted(Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.05 – 0.49	30.56	27.83	22.02	18.07	76.78	175.26
0.50 – 0.99	21.74	12.26	21.18	7.41	63.32	125.91
1.00 – 1.49	15.08	15.22	21.77	6.10	67.60	125.77
1.50 – 2.49	16.69	9.94	24.28	5.58	58.58	115.07
2.50 – 4.99	14.29	5.36	23.83	7.04	44.22	94.74
5.00 – 7.49	9.36	6.00	21.07	5.96	42.62	85.01
7.50+	0.00	0.00	0.00	0.00	0.00	0.00
Total	16.82	13.68	22.58	6.48	55.79	115.35

Table-4.12: Distribution of per decimal production value of land under lease land by Size of land planted (Acres) for Aman 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	245.36	7.92	253.28
0.50 – 0.99	190.07	5.62	195.68
1.00 – 1.49	233.65	8.11	241.76
1.50 – 2.49	221.79	7.35	229.13
2.50 - 4.99	248.21	4.60	252.81
5.00 – 7.49	152.11	3.55	155.66
7.50+	0.00	0.00	0.00
Total	206.60	5.91	212.51

Table-4.13: Distribution of per decimal production cost (excluding leasing) of land under broadcast local Aman by Size of land planted(Acres) for Aman crop 2008-09.

Size of land planted(Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	0.00	0.00	0.00	0.00	0.00	0.00
0.05 – 0.49	20.16	11.55	6.45	3.84	39.79	81.78
0.50 – 0.99	15.24	6.71	6.60	3.28	37.62	69.44
1.00 – 1.49	12.51	4.55	8.59	3.19	35.39	64.23
1.50 – 2.49	10.55	5.12	6.36	2.74	35.51	60.27
2.50 – 4.99	8.88	4.85	5.20	2.01	30.83	51.77
5.00 – 7.49	9.21	5.00	2.20	0.00	25.25	41.66
7.50+	10.59	4.90	2.08	0.00	23.38	40.94
Total	13.27	8.22	6.77	2.99	35.49	66.74

Table-4.14: Distribution of per decimal production value of broadcast local Aman by Size of land planted (Acres) for Aman 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	114.21	9.95	124.17
0.50 – 0.99	107.80	11.38	119.18
1.00 – 1.49	103.44	8.21	111.64
1.50 – 2.49	99.82	8.65	108.47
2.50 - 4.99	86.50	7.19	93.69
5.00 – 7.49	60.05	4.83	64.88
7.50+	74.45	6.41	80.86
Total	101.30	9.08	110.38

Table-4.15: Distribution of per decimal production cost (excluding leasing) of land under local transplanted Aman crop by Size of land planted (Acres) for 2008-09.

Size of land planted(Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	41.83	42.94	18.31	10.59	78.71	192.38
0.05 – 0.49	26.34	33.51	14.83	6.87	70.71	152.25
0.50 – 0.99	19.98	19.12	11.24	4.91	63.82	119.06
1.00 – 1.49	16.84	14.92	9.07	4.89	58.97	104.69
1.50 – 2.49	13.63	12.19	7.15	4.13	58.98	96.08
2.50 – 4.99	10.46	11.06	7.60	4.30	50.81	84.22
5.00 – 7.49	9.00	7.70	6.76	3.25	50.21	76.93
7.50+	6.23	4.44	3.10	2.49	37.49	56.75
Total	15.26	21.35	8.78	4.54	57.67	107.60

Table-4.16: Distribution of per decimal production value of land under local transplanted Aman by Size of land planted (Acres) for 2008-09.

(Fig. in Tk)

Size of land planted(Acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	231.47	12.06	243.53
0.05 – 0.49	167.31	9.88	177.19
0.50 – 0.99	151.66	8.32	159.97
1.00 – 1.49	148.39	6.73	155.12
1.50 – 2.49	141.29	6.67	147.96
2.50 - 4.99	128.97	6.45	135.41
5.00 – 7.49	131.41	6.61	138.02
7.50+	112.30	4.93	117.23
Total	142.30	7.14	149.44

Table-4.17: Distribution of per decimal production cost (excluding leasing) of land under HYV & Hybrid Aman crop by Size of land planted (Acres) for,2008-09..

Size of land planted(Acres)	Land preparation	Seeds	Fertilizer	Pesticide	Other	Total
1	2	3	4	5	6	7
<= 0.04	30.00	36.64	31.68	13.89	85.42	197.62
0.05 – 0.49	31.35	37.77	28.22	11.47	75.98	184.79
0.50 – 0.99	24.30	21.76	27.10	9.10	74.31	156.57
1.00 – 1.49	21.07	16.70	27.03	7.79	71.10	143.68
1.50 – 2.49	18.80	15.31	28.14	6.43	68.33	137.01
2.50 – 4.99	14.49	9.05	27.33	5.22	63.18	119.26
5.00 – 7.49	11.69	8.61	28.31	5.21	58.07	111.88
7.50+	7.92	8.00	24.26	3.24	52.68	96.10
Total	20.45	28.95	27.48	7.56	69.37	153.81

Table-4.18: Distribution of per decimal production value of HYV & HYbrid by Size of land planted (Acres),2008-09.

(Fig. in Tk)

Size of land planted(Acres)	Product Value	By Product Value	Total value
1	2	3	4
<= 0.04	287.83	10.87	298.70
0.05 – 0.49	243.94	8.18	252.12
0.50 – 0.99	245.88	7.01	252.88
1.00 – 1.49	251.19	7.32	258.50
1.50 – 2.49	251.29	6.95	258.24
2.50 - 4.99	240.68	6.47	247.15
5.00 – 7.49	229.11	5.62	234.73
7.50+	226.47	5.92	232.38
Total	245.81	7.00	252.80

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 members 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 vary from place to place. It might be one third ($1/3$) or half ($1/2$) or one two-thirds ($2/3$) 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 criteria 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 Aman has been cultivated during the 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।

আমন ধান উৎপাদন খরচ জরিপ, ২০০৮

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

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

ধানের প্রকারের কোড : বোনা-১, রোপা-২, উফশী-৩ ও হাইব্রীড-৪ মালিকানা কোড: নিজস্ব-১, বর্গা-২, বন্ধক-৩, লীজ-৪ এবং অন্যান্য-৫

২। বীজ, বীজতলা প্রস্তুত, চারা উত্তোলন, চারা ক্রয় ও 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
বোনা-১											
রোপা-২											
উফশী-৩											
হাইব্রীড-৪											

(পারিবারিক কর্মী হলে মজুরী বাজার দরে লিখতে হবে)

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

খন্ড	ইউরিয়া		টিএসপি		পটাশ (এমওপি)		জিস্ক		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														

৪। কীটনাশক ব্যবহারের পরিমাণ ও খরচ (টাকা) এবং সেচ খরচ (টাকা)

খন্ড	বাসুডিন		ফুরাডন/ফুরানল		বিফোর/বিষ্টারেণ		সুনথিয়ান/মেলাথিয়ন		আইপিএম	অন্যান্য	সেচের	মোট
	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	খরচ (টাকা)	মূল্য (টাকা)	খরচ (টাকা)	খরচ (টাকা)
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১	১২	১৩
১ম												
২য়												
৩য়												
৪র্থ												
৫ম												
৬ষ্ঠ												
৭ম												

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

খন্ড	চারা রোপণ			নিড়ানি/আগাছা পরিস্কার			ধান কর্তন			ধান মাড়াই			অন্যান্য	মোট
	শ্রমিকের সংখ্যা		খরচ (টাকা)	শ্রমিকের সংখ্যা		খরচ (টাকা)	শ্রমিকের সংখ্যা		খরচ (টাকা)	শ্রমিকের সংখ্যা		খরচ (টাকা)	খরচ (টাকা)	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														

পারিঃ পারিবারিক

(পারিবারিক কর্মী হলে মজুরী বাজার দরে লিখতে হবে)

৬। 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					

(১ মণ=৪০ কেজি)

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

তথ্য সংগ্রহকারীর নাম -----

সুপারভাইজারের নাম -----

পদবী -----

পদবী -----

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