



Report on the Cost of Production of Aus Crop 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 basically an agriculture based country. Though the contribution of industrial sector to the gross domestic product (GDP) is gradually increasing over the decades still agriculture sector plays strong dominance in the economy of Bangladesh. Most importantly, food security of the vast population of the country is critically dependent on the production of crops locally. Therefore, the development of agriculture sector is directly related with the development of our country.

Production of crops is directly dependent on the cost of production. Every year Government declares procurement prices before harvesting time of 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 know cost of production.

I am pleased to know that the UCPSCP Project performed successfully the responsibility of conducting surveys for the first time. I hope that data presented in the publication would be very much helpful and useful in policy formulation and planning for the development of crop sectors of the country.

I would like to extend my thanks to the Director General, BBS, the Project Director and her other colleagues who worked hard to prepare this report.

Dhaka,
June, 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,
June, 2010.

Md. Shahjahan Ali Mollah

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Key Findings: At a glance

SL. No.	Items of study	Result
1.	Percentage of household having Aus cultivation in the sample area	16.43
2.	Percentage of household growing Aus by land tenure:	
	a. Own	63.43
	b. Share cropping	20.94
	c. Mortgage	6.52
	d. Lease	7.67
	e. Others	1.44
3.	Yield of Aus crop per acre(in maund)	27.76
4.	Yield of Aus straw per acre (in maund)	14.39
5.	Number of labourers employed by component for per acre production of Aus:	
	a. Seed-bed preparation	2.47
	b. Plucking of seedlings	2.69
	c. Sowing/Planting	5.99
	d. weeding	11.66
	e. Harvesting	11.73
	f. Thrashing	5.73
	Total	40.27
6.	Number of family labourers worked for per acre Aus production	11.90
7.	Production cost of Aus crop per kilogram (in taka)	12.21
8.	Farmgate price of Aus crop per kilogram (in taka)	16.20
9.	Farm-gate price of straw per kilogram (in taka):	1.79
10.	Cost of land preparation per acre (in taka):	1882
11.	Cost of seeds per acre(in taka)	490
12.	Cost of seed-bed preparation per acre (in taka)	422
13.	Cost of plucking of seedlings per acre (in taka)	641
14.	Cost of planting of seedlings per acre (in taka)	927

Key Findings: At a glance

SL. No.	Items of study	Result
15.	Cost of fertilizers by type per acre (in taka):	
	a. Urea	499
	b. TSP	459
	c. MoP	107
	d. Zinc	18
	e. Gypsum	6
	.f. Organic	40
	g. Other Cost	48
	Total	1177
16.	Cost of insecticides per acre (in taka)	273
17.	Cost of irrigation per acre (in taka)	1661
18.	Cost of weeding per acre (in taka)	289
19.	Cost of harvesting per acre (in taka)	1601
20.	Cost of thrashing per acre (in taka)	737
21.	Cost of leasing per acre (in taka)	3003

Chapter 1

Introduction

Introduction

Bangladesh is the most populous country in the world. Now, the estimated population of the country might be more than 150 millions. The staple food of the majority of the huge population is rice. Aus is one of the important varieties. The core demand of food is met through procuring from own production or importing from abroad. Bangladesh, is an agricultural country with fertile land. Agriculture is one of the major economic activities which employs about 50% of labour force of the country and contributes 19% of the gross domestic product (GDP). To meet food demand of her population Bangladesh must have to be self sufficient in food production. The Government of Bangladesh has, therefore, manifested agricultural development as a priority area to meet the domestic demand of food, to ensure stability of prices and to make sure the accessibility of food to all the marginal classes in the society. Availability of basic data regarding the structure and other characteristics of agriculture is precondition for appropriate policy formulation, determining action plan and programme in agriculture. Data required for these purposes are provided through the census of agriculture and annual/seasonal agriculture statistics. To meet the data requirement, Agriculture Wing has been conducting different national level sample surveys on a regular basis throughout the year for producing agricultural statistics. Generally Agriculture Wing has been producing area and production statistics of different crops. Data on production cost of crops specially staple crops are very much required for the government to support the small and marginal farmers. To ensure the fair price for farmers, it is necessary to fix up a reasonable procurement price of rice. It is to be noted here that procurement price of a crop can be determined on the basis of the production cost. Production cost is also important in supporting the farmers to provide fertilizer, irrigation etc. with subsidized price. Despite the data need on production cost, there is no reliable data set. This project of Bangladesh Bureau of Statistics has undertaken a series of sample surveys on production cost of 10 crops. Aus crop is one of them.

Although the area under Aus crop has been declining due to tremendous increase in the area under Boro crop, still Aus crop contributes a significant share in overall supply of cereal crops. The total area under Aus crop in 2008-09 was 10.66 lac hectares. The total production was estimated at 18.95 lac metric tons.

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 farmers get fair price of the crop produced during harvesting time. Generally, Government has to declare procurement price at the harvesting time of crop so that producers 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. So an objective survey is necessary to know the cost of production of crops at farmer's level.

Aus: A major cereal crop of Bangladesh.

The paddy which are sown in March-April and harvested in July-August is considered to be Aus paddy. There are two types of Aus namely local Aus and high yielding variety (HYV) Aus.

From time immemorial Aus paddy which is grown in our country is called local Aus. Generally this type of paddy does not need irrigation and is purely dependent on rainfall. It gives a lower yield.

HYV Aus is generally transplanted. If weather remains dry, plants sometimes demand irrigation.

Production of Aus:

Bangladesh occupies most lands of the great Bengal plane of the Ganges Delta with affluent alluvial soils. Moreover, it is a riverine area with plentiful water resources with hot and humid monsoon climate. All these factors have made Bangladesh the most significant for paddy cultivation in the world. However, the overall natural climatic and geographic condition of Bangladesh is blissful for growing paddy.

**Table:1 Acreage, Production and Yield Rate of Aus Rice during the last ten years.
From 1998-99 to 2007-2008**

Year	Area In '000' acres	Production In '000' M. tons	Yield rate M. tons
1998-99	3519	1617	0.460
1999-00	3340	1734	0.519
2000-01	3275	1916	0.585
2001-02	3069	1808	0.589
2002-03	3073	1851	0.602
2003-04	2972	1832	0.616
2004-05	2532	1500	0.592
2005-06	2556	1745	0.683
2006-07	2238	1512	0.676
2007-08	2270	1507	0.664

Source: Yearbook of Agricultural Statistics, 2004, Statistical Yearbook of Bangladesh, 2008.

Acreage, production and yield rate of Aus Rice from 1998-99 to 2007-2008 are presented in table 1. It reveals that total area under Aus crop shown in table 1 has been declining gradually. Sharp increase in the area under Boro crop is responsible for decrease in the area under Aus crop. But it is interesting to note that yield rate shows upward trend, it may be due to increasing trend of HYV Aus cultivation.

1.1 Scope and coverage of the survey.

Survey on the production cost of *Aus* paddy 2008 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.

1.2 Objectives of the survey

The broad objectives of this survey are to derive production cost of per acre cultivation of *Aus* crop on the one hand and production cost of per kilogram *Aus* on the other.

The specific objectives of this survey are as follows:

- (a) To determine the division-wise production cost of per acre cultivation of *Aus* crop.
- (b) To determine the division-wise production cost of per kilogram *Aus* crop.
- (c) To estimate the division-wise per acre production of Aus crop as well as by-product.

Chapter 2

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. Aus is one of the 10 crops. Sample design has been discussed in detail below:

2.1.1 Universe:

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

2.1.2 Sampling Technique:

Multi-stage sampling technique has been followed.

2.1.3 Sampling Frame:

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

2.1.4 Detailed Sample Design:

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

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

2.1.5 Sample Size Determination

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

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

Where,

P= Proportion of a crop to total gross cropped area

q=1-p

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

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

2.1.6 Selection Procedure

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

unit in the survey. All farm households growing the particular crop in the selected Mouzas/EAs have been interviewed in the survey.

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

Allocation of PSU and Sample Households

Total number of primary sampling unit (PSU), secondary sampling unit (SSU), ultimate sampling unit (USU) and households (HH) having Aus crop are shown in the table below:

Division	Total Number				Percent of household having <i>Aus</i> crop
	PSU (Upazila)	SSU (Mouza)	USU (Households)	Household having <i>Aus</i> crop	
Barisal	9	9	2250	699	31.07
Chittagong	16	16	3625	928	25.60
Dhaka	25	25	6250	315	5.04
Khulna	16	16	4000	1432	35.80
Rajshahi	28	28	7000	512	7.31
Sylhet	6	6	1500	241	16.07
Bangladesh	100	100	24625	4127	16.76

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

2.2.1 Questionnaire Design:

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

Process of questionnaire design

A sub-committee comprising of eight members- all from the different Wings of Bangladesh Bureau of Statistics (BBS) – have been formed in order to facilitate the questionnaire development activity. Project Director, Advisor and some other members of the sub-committee have paid several visits to the field with a view to being acknowledged what are the factors of production and the pros and cons of the whole process of the production of Aus as well. They discuss the matter with the farmers who grow Aus. 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.

Pre-testing the questionnaire

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

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 Aus 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.

Finalization of the Questionnaire

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

2.2.2 Training:

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

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

2.2.3 Method of Data Collection:

Face to face interview has been carried out following Paper and Pencil (PAPI) method. Data collection has been taken place from 14 to 25 October 2008 at the homestead of the household. Usually the respondents are the head of household. The total of 100 enumerators, who are the employees of BBS and have proven experience in this field, have been engaged in data collection from the household and the total of 28 supervising officer named Regional Coordinators are responsible for supervising the data collection task. All supervising officers have been directed to stay at the respective region during the period of data collection so that they can extensively supervise data collection task and address instantly any untoward problem arising during data collection. Three

divisional coordinators including Project Director are also responsible to oversee all activities at field level relating to data collection. Furthermore, all possible measures have been taken to have a good quality of data.

2.2.4. Data Editing and Coding:

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

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

2.2.5 Data Processing:

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

Data Entry:

(i). Software Used: Five software 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.

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

(iii) 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 programme to avoid errors and inconsistency.
- **Treatment of Missing values:** The data entry programme has been designed not to allow blanks that ensure not having missing values in the data.
- **Incomplete records and dropped cases.** The data entry programme 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 programme has been designed in view of rejecting duplication of entries based on the identifiers.

Appending and Merging files:

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

(iv) Data Validation:

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

(v) 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.

(vi) 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.

(vii). Data preservation:

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

2.3 Tabulation:

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

2.4(i) 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 Aus have also been explained nationally.

2.4(ii) 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 Agricultural Statistics of Bangladesh, and Monthly Statistical Bulletin etc.

Chapter 3

Statistical Findings

Statistical Findings

Table 3.1. Total area under Aus crop in the survey and its percentage

(Area in acres)

Division	Local Aus		HYV Aus		Hybrid Aus		Combined Aus	
	Area	%	Area	%	Area	%	Area	%
Barisal	201	18.22	334	18.38	1	1.82	537	18.05
Chittagong	373	33.82	489	26.91	1	1.82	863	29.01
Dhaka	162	14.69	82	4.51	3	5.45	247	8.30
Khulna	277	25.11	535	29.44	45	81.82	857	28.81
Rajshahi	47	4.26	210	11.56	4	7.27	261	8.77
Sylhet	43	3.90	168	9.25	0	0.00	210	7.06
Bangladesh	1103	100.00	1817	100.00	55	100.00	2975	100.00
Row %	37.08		61.08		1.84		100.00	

Production cost survey for Aus crop was carried out in September, 2008. In this survey, data on area under Aus paddy, land tenure, leasing, means of land preparation, seed and seedling cost, quantity and cost of fertilizer used, insecticides cost, sowing/plantation, weeding, harvesting, thrashing and other related cost were collected. Moreover, per acre production cost as well as per kilogram production cost were computed. It is observed from table 3.1 that area under Aus crop was 37.08%, 61.08%, and 1.84% for local, HYV, and hybrid respectively. It is to be noted here that area under hybrid Aus is not significant in Bangladesh. In cultivation of Aus crop, Chittagong division covers large area (29.01%) compared to other divisions. For HYV Aus, Khulna division achieves the highest portion (29.44%). Survey data show that no hybrid Aus are cultivated in Sylhet division.

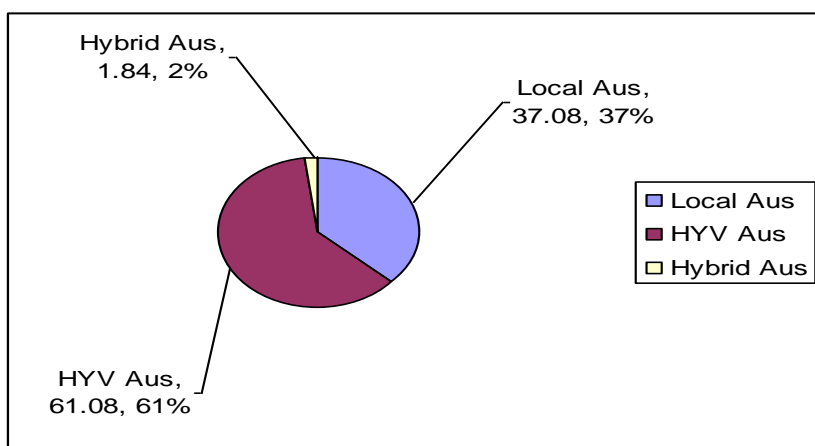


Figure 1. Area under Aus Crop (%) by Variety in Bangladesh

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

3.2 Land tenure:

Households growing Aus crop by type of land tenure ship in percentage are shown below.

Table 3.2(a). Percentage of area under local Aus by land tenure ship and by division

(in percent)						
Division	Owner	Share cropping	Mortgage	Lease	Others	Total
Barisal	69.47	11.15	2.01	17.37	0.00	100.00
Chittagang	57.44	34.17	1.26	2.52	4.61	100.00
Dhaka	72.96	13.52	3.18	10.14	0.20	100.00
Khulna	62.90	27.53	5.45	2.13	2.00	100.00
Rajshahi	78.05	1.83	17.68	2.44	0.00	100.00
Sylhet	72.15	23.42	3.80	0.63	0.00	100.00
Bangladesh	66.74	20.72	4.19	6.88	1.46	100.00

In Bangladesh, it is observed that slightly more than two-thirds of local Aus crop land is cultivated by owner himself/herself followed far behind by share cropping. Share cropping system in Rajshahi division is insignificant while a significant portion of Aus land is cultivated by mortgage system. Sylhet division experiences almost no leasing system.

Table 3.2(b). Percentage of area under HYV Aus by land tenure

(in percent)						
Division	Owner	Share cropping	Mortgage	Lease	Others	Total
Barisal	61.33	6.79	11.76	19.76	0.36	100.00
Chittagang	45.43	39.71	4.87	9.87	0.12	100.00
Dhaka	59.62	15.77	14.62	10.00	0.00	100.00
Khulna	68.22	14.78	9.35	5.13	2.53	100.00
Rajshahi	72.83	19.45	4.50	0.48	2.73	100.00
Sylhet	82.74	12.81	4.27	0.18	0.00	100.00
Bangladesh	62.00	21.38	7.57	7.91	1.15	100.00

Area under HYV Aus by land tenure is shown in table 3.2(b). For HYV cultivation, it is seen that 62% of aus crop land is cultivated by owner himself/herself while 21.38% by share cropping. In Barisal division, the percentage of land under share cropping is lower compared to mortgage and leasing systems.

Table 3.2(c). Percentage of area under hybrid Aus by land tenure

(in percent)

Division	Owner	Share cropping	Mortgage	Lease	Others	Total
Barisal	66.67	0.00	22.22	11.11	0.00	100.00
Chittagong	100.00	0.00	0.00	0.00	0.00	100.00
Dhaka	93.33	6.67	0.00	0.00	0.00	100.00
Khulna	53.72	8.26	8.26	14.88	14.88	100.00
Rajshahi	66.67	33.33	0.00	0.00	0.00	100.00
Sylhet	0.00	0.00	0.00	0.00	0.00	0.00
Bangladesh	59.62	8.97	7.69	12.18	11.54	100.00

Area under hybrid Aus by land tenure is exhibited in table 3.2(c). For hybrid cultivation, it is seen that almost 60% of Aus crop land is cultivated by owner himself/herself followed by leasing system. All the hybrid Aus land in Chittagong division is cultivated by owner. No share cropping exists in Barisal, Chittagong and Sylhet division while Dhaka, Chittagong, Rajshahi and Sylhet divisions witness no mortgage and leasing systems.

Table 3.2(d). Percentage of area under combined Aus by land tenure

(in percent)

Division	Owner	Share cropping	Mortgage	Lease	Others	Total
Barisal	64.59	8.47	7.97	18.76	0.22	100.00
Chittagong	48.16	38.44	4.06	8.22	1.12	100.00
Dhaka	68.90	14.14	6.94	9.90	0.13	100.00
Khulna	65.94	18.25	8.14	4.70	2.96	100.00
Rajshahi	73.84	15.98	7.17	0.88	2.14	100.00
Sylhet	80.42	15.14	4.17	0.28	0.00	100.00
Bangladesh	63.43	20.94	6.52	7.67	1.44	100.00

Table 3.2(d) shows the area under combined Aus by land tenure. It is observed that 63.43% of households cultivated Aus paddy in their own lands followed by 20.94% share cropping, 6.54% mortgage, 7.67% lease and 1.44% others. In Barisal division leasing system dominates over share cropping and mortgage systems.

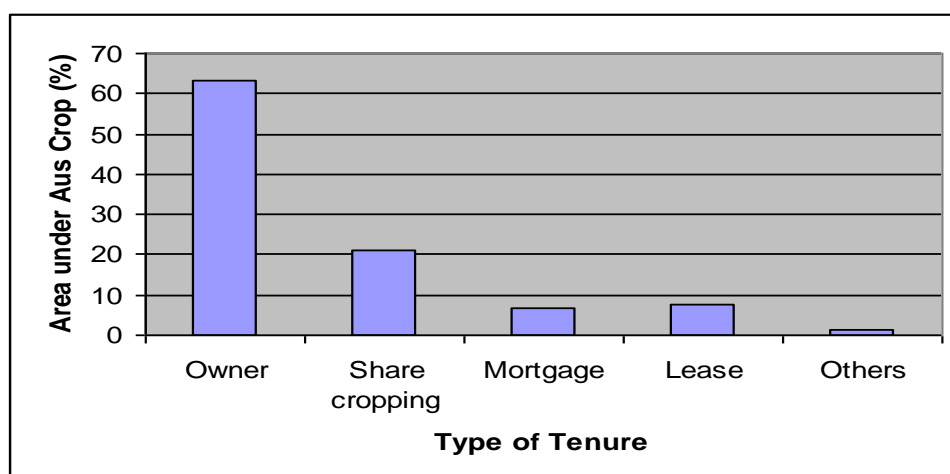


Figure 2. Area under Aus Crop (%) by Tenure in Bangladesh

Type of tenure for Aus crop in Bangladesh suggests that own arrangement, that is, owner's land for Aus cultivation is three times larger than share cropping system while leasing dominates mortgage system.

Leasing:

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

Table 3.3. Per acre leasing cost by division and by variety of Aus crop.

(Figures in Tk.)

Division	Local Aus	HYV Aus	Hybrid Aus	Combined Aus
Barisal	2773	3080	3333	2940
Chittagong	2553	3297	0	3188
Dhaka	2692	3030	0	2801
Khulna	2355	3131	3341	3072
Rajshahi	2621	2556	0	2579
Sylhet	2667	2400	0	2476
Bangladesh	2711	3153	3341	3003

The average per acre leasing cost for aus crop in Bangladesh is found to be Tk. 3003. The costs are Tk. 2711, Tk. 3153, and Tk. 3341 for local aus, HYV Aus, and hybrid Aus respectively. There is no significant variations for leasing costs irrespective of varieties across divisions.

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 3.4(a).

Table 3.4(a). Per acre land preparation cost for local Aus allocated by means of cultivation and by division

(Figures in Tk.)

Division	Plough		Power tiller		Others	Total
	Owned	Rented	Owned	Rented		
Barisal	89	91	32	1293	14	1519
Chittagong	30	13	179	1159	323	1704
Dhaka	582	29	207	925	146	1890
Khulna	71	368	49	903	78	1470
Rajshahi	77	104	125	1046	374	1726
Sylhet	482	49	101	490	198	1321
Bangladesh	152	124	118	1054	177	1625

The average per acre land preparation cost for local Aus crop in Bangladesh is recorded at Tk. 1625. Dhaka, Chittagong and Rajshahi divisions spent more than average cost on land preparation compared to other three divisions. A large portion of expenditure for land preparation goes to the mechanized power tiller in all the divisions. For Dhaka, Khulna and Sylhet divisions, it is found that a significant percent of land under Aus crop is prepared by plough.

Table 3.4(b). Land preparation cost per acre for HYV Aus allocated by means of cultivation and by division

(Figures in Tk.)

Division	Plough		Power tiller		Others	Total
	Owned	Rented	Owned	Rented		
Barisal	300	137	224	1219	9	1889
Chittagong	366	21	43	1315	224	1969
Dhaka	163	59	6	1671	179	2078
Khulna	258	243	43	1153	253	1950
Rajshahi	621	151	226	1074	313	2385
Sylhet	834	260	139	976	153	2362
Bangladesh	386	146	104	1207	195	2038

It is observed from the table 3.4(b) that the average per acre land preparation cost for HYV Aus crop in Bangladesh is Tk.2038. Rajshahi and Sylhet divisions are still dependent on traditional plough system compared to other divisions.

Table 3.4(c). Land preparation cost per acre for hybrid Aus allocated by means of cultivation and by division

(Figures in Tk.)

Division	Plough		Power tiller		Others	Total
	Owned	Rented	Owned	Rented		
Barisal	108	432	0	1597	0	2137
Chittagong	0	0	0	1212	227	1439
Dhaka	29	0	0	1496	372	1897
Khulna	73	74	9	1501	275	1931
Rajshahi	0	228	0	1269	217	1715
Sylhet	0	0	0	0	0	0
Bangladesh	64	90	7	1481	269	1911

It is observed from the table 3.4(c) that the average per acre land preparation cost for hybrid Aus crop in Bangladesh is Tk. 1911. Most of the land under hybrid Aus is cultivated by the mechanized power tiller while Barisal and Rajshahi divisions experience plough as well.

Table 3.4(d). Land preparation cost per acre for combined Aus allocated by means of cultivation and by division

(Figures in Tk.)

Division	Plough		Power tiller		Others	Total
	Owned	Rented	Owned	Rented		
Barisal	220	120	151	1248	11	1751
Chittagong	221	17	102	1248	267	1854
Dhaka	435	39	138	1180	160	1952
Khulna	188	274	43	1090	198	1794
Rajshahi	513	144	204	1072	322	2256
Sylhet	763	217	131	877	162	2150
Bangladesh	293	137	108	1155	189	1882

It is observed from the table 3.4(d) that the average per acre land preparation cost for combined Aus crop in Bangladesh is Tk. 1882. Table 3.4(d) shows as high as 67.11% of total cost spent through the mechanized tilling system.

Table 3.5. Seed cost per acre by division and by variety of Aus crop and by division.

Division	Local Aus		HYV Aus		Hybrid Aus		Combined Aus	
	KG	Tk	KG	Tk	KG	Tk	KG	Tk
Barisal	23.23	465	15.28	382	6.72	538	18.79	419
Chittagong	31.69	638	15.39	385	8.33	667	23.39	509
Dhaka	37.09	742	15.17	379	8.13	650	28.78	610
Khulna	31.18	624	15.38	384	10.55	844	20.26	495
Rajshahi	33.53	671	15.39	385	6.76	541	18.83	445
Sylhet	40.37	807	15.46	386	0.00	0	19.95	462
Bangladesh	31.03	622	15.36	384	9.98	799	21.52	490

Per acre seed cost by variety of Aus crop and by division is presented in table 3.5. The average seed requirement per acre is found to be 21.52 kilogram which costs Tk. 490. Per acre seed requirement for local Aus is much higher than that of HYV and hybrid varieties. There is almost no variation for per acre seed requirement in HYV Aus across divisions while for local Aus significant variations are observed.

Table 3.6. Number of labourers engaged and cost incurred for seed-bed preparation per acre by division and by variety of Aus crop.

Division	Local Aus		HYV Aus		Hybrid		Combined Aus	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	0.55	89	4.11	730	4.20	143	2.52	442
Chittagong	0.00	0	3.96	719	1.52	76	2.01	365
Dhaka	0.53	86	3.48	634	4.07	780	1.64	293
Khulna	0.34	52	4.40	761	2.72	602	2.95	517
Rajshahi	0.14	5	2.50	362	1.97	138	2.02	286
Sylhet	0.68	95	5.27	737	0.00	0	4.44	621
Bangladesh	0.28	44	3.99	682	2.75	555	2.47	422

It is seen from the table that the average number of labourers required for per acre seed-bed preparation at national level is 2.47 and their cost is recorded at Tk. 422. Labourers required in Sylhet division is the highest 4.44 followed by Khulna 2.95, Barisal 2.52 and the lowest 1.64 in Dhaka division.

Table 3.7. Per acre number of labourers engaged and cost incurred for plucking of seedlings by division and by variety of Aus crop.

Division	Local Aus		HYV Aus		Hybrid Aus		Combined Aus	
	No. of labourer	Cost (Tk)	No. of labourer	Cost (Tk)	No. of labourer	Cost (Tk)	No. of labourer	Cost (Tk)
Barisal	0.89	130	7.72	1468	5.88	273	4.67	867
Chittagong	0.00	0	7.95	1206	3.03	455	4.04	612
Dhaka	0.78	117	9.60	1174	6.10	850	4.03	507
Khulna	1.91	184	6.11	729	4.24	541	4.60	537
Rajshahi	0.00	0	6.55	877	6.76	676	5.25	699
Sylhet	0.68	95	7.82	996	0.00	0	6.53	833
Bangladesh	0.77	89	7.21	1032	4.57	560	4.55	641

Per acre number of labourers engaged and cost incurred for plucking of seedlings by divisions are exhibited in table 3.7. It is seen from the table that the average number of labourers required for per acre plucking of seedlings at national level is 4.55 and their cost is recorded at Tk.641. It is also seen that the highest labourers required in Sylhet division(6.53), followed by Rajshahi division(5.25). The lowest is in Dhaka division (4.03). The highest cost is seen in Barisal division.

Table 3.8(a). Quantity of fertilizer per acre used for local Aus by type of fertilizer and by division.

(Figures in Kg)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic
Barisal	24.42	3.40	0.13	0.00	0.03	0.76
Chittagong	24.29	8.49	0.17	0.00	0.00	9.25
Dhaka	29.69	7.80	1.40	0.00	0.25	6.68
Khulna	38.19	6.68	1.90	0.58	0.74	13.97
Rajshahi	36.80	11.43	2.55	0.00	0.04	85.24
Sylhet	47.95	0.00	0.46	0.00	0.00	97.15
Bangladesh	30.13	6.77	0.89	0.15	0.23	15.30

In Bangladesh, per acre average requirements of urea, TSP, MOP, zinc, gypsum and organic for local Aus are 30.13, 6.77, 0.89, 0.15, 0.23 and 15.30 kilograms respectively. No TSP, zinc and gypsum are used for local Aus in Sylhet division.

Table 3.8(b). Per acre quantity of fertilizer used for HYV Aus by division

(Figures: in Kg)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic
Barisal	41.61	8.31	2.16	0.00	0.00	7.08
Chittagong	38.51	6.16	2.85	1.90	1.13	40.09
Dhaka	54.40	12.02	6.01	0.00	5.79	67.12
Khulna	50.30	16.95	9.11	1.61	2.00	57.51
Rajshahi	58.70	11.23	1.70	0.05	3.14	106.52
Sylhet	34.51	1.28	2.00	0.00	0.00	177.32
Bangladesh	45.24	10.14	4.50	0.99	1.51	60.76

It is observed that per acre quantity of organic fertilizer used for HYV Aus in Bangladesh is found to be 60.76 kilogram. As high as 177.32 kilogram organic fertilizer is required for per acre HYVAus cultivation in Sylhet division while no user of zinc and gypsum exists there and also in Barisal.

Table 3.8(c). Quantity of fertilizer per acre used for Hybrid Aus by division

(Figures: in Kg)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic
Barisal	58.99	17.99	4.32	0.00	0.00	115.11
Chittagong	36.36	15.15	7.58	0.00	0.00	16.67
Dhaka	50.14	18.91	8.45	2.01	7.16	57.31
Khulna	55.77	15.16	6.62	1.88	2.15	7.65
Rajshahi	58.22	11.19	2.06	0.00	10.96	114.16
Sylhet	0.00	0.00	0.00	0.00	0.00	0.00
Bangladesh	55.44	15.15	6.32	1.66	3.12	22.70

It is seen from the table 3.8(c) that per acre average requirements of urea, TSP, MOP, zinc, gypsum and organic for hybrid Aus in Bangladesh are 55.44, 15.15, 6.32, 1.66, 3.12 and 22.70 kilograms respectively. Survey data show that farmers/cultivators do not use zinc and gypsum for hybrid Aus in Barisal and Chittagong divisions. No use of fertilizers in Sylhet division implies that no hybrid Aus are cultivated there.

Table 3.8(d). Quantity of fertilizer per acre used for Combined Aus by division

(Figures: in Kg)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic
Barisal	35.29	6.52	1.41	0.00	0.01	5.02
Chittagong	32.53	7.15	1.72	1.10	0.65	27.10
Dhaka	38.51	9.42	3.09	0.03	2.26	28.28
Khulna	46.70	13.58	6.68	1.30	1.60	41.05
Rajshahi	54.80	11.26	1.86	0.04	2.72	102.87
Sylhet	37.19	1.03	1.70	0.00	0.00	161.31
Bangladesh	39.95	9.01	3.23	0.70	1.08	43.60

It is observed from the table 3.8(d) that in Bangladesh, per acre average requirements of urea, TSP, MOP, zinc, gypsum and organic are 39.95, 9.01, 3.23, 0.70, 1.08 and 43.60 kilograms respectively. No zinc and gypsum users are found for combined Aus in Sylhet division.

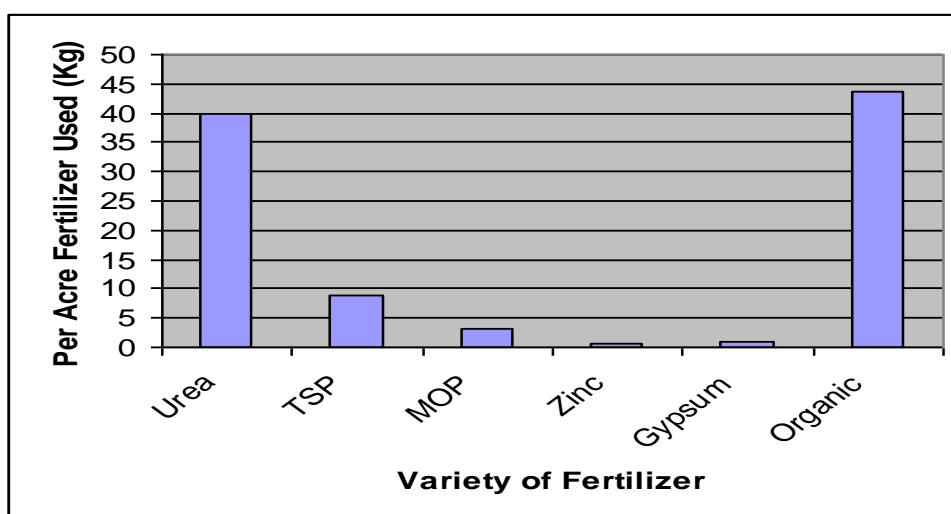


Figure 3. Per acre fertilizer used (Kg.) by variety of fertilizer in Bangladesh Figure 3 displays that urea and organic fertilizers are used in almost same quantity for per acre Aus land. It also shows that use of TSP is three times higher than that of MOP.

Table 3.9(a). Price of fertilizer per acre used for local Aus by division

(Figures: in Tk)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic	Other cost	Total
Barisal	308.92	173.17	4.27	0.00	0.15	1.12	10	498
Chittagong	291.43	432.94	5.47	0.00	0.00	5.16	9	744
Dhaka	367.23	398.00	46.88	0.00	1.39	4.94	4	823
Khulna	458.24	340.54	62.77	15.08	4.42	12.34	29	923
Rajshahi	558.82	583.15	84.17	0.00	0.26	60.82	6	1294
Sylhet	662.24	0.00	15.61	0.00	0.00	97.15	119	894
Bangladesh	374.57	345.30	29.66	3.87	1.37	12.28	18	785

Table 3.9(a) shows the per acre price of fertilizer used for local Aus by division. In Bangladesh, the average per acre price of fertilizer for local Aus stands at Tk 785. Rajshahi division spends more on TSP across divisions and varieties as well while Sylhet division makes higher expenditure for urea. Zinc is used only in Khulna division, the reason is unknown, may be due to salinity exist there.

Table 3.9(b). Per acre price of fertilizer used for HYV Aus by division

(Figures: in Tk)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic	Other cost	Total
Barisal	505	424	71	0	0	4	0	1004
Chittagong	462	314	94	49	7	23	20	969
Dhaka	684	613	198	0	35	41	28	1599
Khulna	638	865	301	42	11	65	75	1996
Rajshahi	767	573	56	1	16	107	196	1715
Sylhet	455	65	67	0	0	177	114	879
Bangladesh	566	517	149	26	8	57	62	1385

It is seen from the table 3.9(b) that the average price of fertilizer for HYV Aus is found to be Tk 785 in Bangladesh. About Tk. 2000 is spent for fertilizer in Khulna division and it is seen that Khulna spends more on TSP across divisions as well as varieties.

Table 3.9(c). Price of fertilizer per acre used for Hybrid Aus by division

(Figures: in Tk)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic	Other cost	Total
Barisal	708	917	142	0	0	58	0	1825
Chittagong	436	773	250	0	0	17	114	1589
Dhaka	602	964	282	52	43	29	0	1972
Khulna	669	773	219	49	13	8	214	1944
Rajshahi	699	571	68	0	55	91	0	1483
Sylhet	0	0	0	0	0	0	0	0
Bangladesh	665	773	209	43	18	17	175	1900

Table 3.9(c) shows the price of fertilizer per acre for Hybrid Aus by division. In Bangladesh Tk. 1900, on an average, is spent against fertilizer for per acre hybrid Aus cultivation. It is observed that Tk. 1972 is spent for fertilizer in Dhaka division with the highest spending on TSP(Tk 964) for hybrid Aus across divisions and varieties as well.

Table 3.9(d). Per acre price of fertilizer used for Combined Aus by division

(Figures: in Tk)

Division	Urea	TSP	MOP	Zinc	Gypsum	Organic	Other cost	Total
Barisal	433	332	47	0	0	3	4	819
Chittagong	390	364	57	29	4	16	15	875
Dhaka	480	481	103	1	14	18	12	1108
Khulna	582	692	220	34	9	45	67	1650
Rajshahi	729	574	61	1	14	98	159	1636
Sylhet	496	52	57	0	0	161	115	882
Bangladesh	499	459	107	18	6	40	48	1177

It is seen from the table 3.9(d) that in Bangladesh, per acre average cost for fertilizer is registered at Tk. 1177. Most of the expenditure is incurred to urea, TSP and MOP. In terms of cost zinc, gypsum and organic fertilizers seem no more important in Aus cultivation.

Table 3.10(a). Per acre cost of insecticides/pesticides, irrigation cost and other cost for local Aus by division

(Figures: in Tk.)

Division	Insecticides/pesticides cost	Irrigation cost	Other cost
Barisal	22	0	279
Chittagong	133	0	13
Dhaka	37	0	0
Khulna	42	283	17
Rajshahi	148	17	19
Sylhet	229	0	168
Bangladesh	77	53	119

It is observed that per acre average insecticide/pesticide cost stands at Tk 77 while it is Tk 53 for irrigation. Other cost is deemed to be dominant for local Aus. This can be seen in table 3.10(a).

Table 3.10(b). Per acre cost of insecticides/pesticides, irrigation cost and other cost for HYV Aus by division

(Figures: in Tk.)

Division	Insecticides/pesticides cost	Irrigation cost	Other cost
Barisal	477	0	19
Chittagong	374	104	27
Dhaka	228	625	111
Khulna	246	509	147
Rajshahi	357	316	72
Sylhet	223	665	102
Bangladesh	326	336	85

It is seen that Tk 336 is spent for irrigation in case of HYV Aus cultivation and almost same amount for insecticides. Insecticides/ pesticides cost is seen to be the highest in Barisal division (477), followed by Chittagong (374). Irrigation cost in Barisal is nil.

Table 3.10(c). Per acre cost of insecticides/pesticides, irrigation cost and other cost for hybrid Aus by division

(Figures: in Tk.)

Division	Insecticides/pesticides cost	Irrigation cost	Other cost
Barisal	181	0	0
Chittagong	204	0	0
Dhaka	88	305	6
Khulna	332	862	234
Rajshahi	186	661	46
Sylhet	0	0	0
Bangladesh	299	778	195

Table 3.10(c) depicts that per acre cost for irrigation stands at Tk 778 and it is Tk 299 for insecticides. It is observed that Tk 195 is spent for other cost. Irrigation cost is seen 862 in Khulna division, followed by Rajshahi division. No irrigation cost is seen both in Barisal, Chittagong and Sylhet division. May be there is no cultivation of hybrid Aus in Sylhet division as the figure in all cores is seen nil.

Table 3.10(d). Per acre cost of insecticides/pesticides, irrigation cost and other cost for combined Aus by division

(Figures: in Tk.)

Division	Insecticides/pesticides cost	Irrigation cost	Other cost
Barisal	340	0	97
Chittagong	318	80	24
Dhaka	133	320	55
Khulna	228	507	138
Rajshahi	324	281	64
Sylhet	224	527	116
Bangladesh	273	289	96

It is observed from table 3.10(d) that per acre average insecticide/pesticide cost stands at Tk 273 while it is Tk 289 for irrigation. It is to be noted here that no irrigation cost is recorded in Barisal division.

Table 3.11. Number of labourers engaged and cost of sowing of seeds/planting of seedlings per acre by division and by variety of Aus crop and by division.

Division	Local Aus		HYV Aus		Hybrid		Combined Aus	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	2.00	347	8.38	1564	10.07	1853	5.98	1107
Chittagong	1.36	163	10.03	1407	7.58	1136	6.27	868
Dhaka	0.76	114	11.93	1957	10.89	1605	4.63	749
Khulna	1.74	249	7.33	1213	6.99	1306	5.51	907
Rajshahi	0.04	5	7.60	1092	10.27	1265	6.29	899
Sylhet	0.68	93	10.08	1285	0.00	0	8.12	1037
Bangladesh	1.40	202	8.74	1356	7.58	1333	5.99	927

The average number of labourers required for per acre sowing/planting at national level is 5.99 and their cost is recorded at Tk. 927. There is no significant difference for cost of labourer between HYV and hybrid varieties.

Table 3.12. Per acre number of labourers engaged and cost of weeding by division and by variety of Aus crop

Division	Local Aus		HYV Aus		Hybrid		Combined Aus	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	10.33	1339	8.96	1617	12.23	1978	9.48	1513
Chittagong	10.10	1242	17.47	2138	12.12	1727	14.27	1750
Dhaka	16.86	2342	9.63	1415	12.89	1905	14.39	2027
Khulna	13.36	2336	9.50	1445	8.96	1658	10.72	1744
Rajshahi	13.06	2594	10.87	1428	10.96	1130	11.26	1633
Sylhet	8.13	1009	7.47	897	0.00	0	7.61	921
Bangladesh	11.99	1743	11.53	1611	9.49	1640	11.67	1661

The average number of labourers required for per acre weeding at national level is 11.67 and their cost is recorded at Tk.1661. There is no significant difference for cost of labourer between HYV and hybrid varieties.

Table 3.13. Per acre number of labourers engaged and cost of harvesting by division and by variety of Aus crop

Division	Local Aus		HYV Aus		Hybrid		Combined Aus	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	9.84	1323	8.62	1563	10.79	1906	9.09	1474
Chittagong	10.83	1401	13.45	1852	12.12	1727	12.32	1657
Dhaka	10.69	1429	12.47	2267	7.74	1160	11.24	1704
Khulna	12.95	1346	14.20	1798	16.41	1830	13.91	1654
Rajshahi	13.23	1786	9.23	1503	9.59	1895	9.96	1561
Sylhet	9.50	1477	10.18	1379	0.00	0	10.04	1399
Bangladesh	11.21	1396	11.96	1719	15.11	1793	11.74	1601

The average number of labourers required for per acre harvesting at national level is 11.74 and their cost is recorded at Tk. 1601. There is no significant difference for cost of labourer between HYV and hybrid varieties.

Table 3.14. Per acre number of labourers engaged and cost of thrashing by division and by variety of Aus crop.

Division	Local Aus		HYV Aus		Hybrid		Combined Aus	
	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)	No. of labour	Cost (Tk)
Barisal	4.31	656	6.08	893	7.19	917	5.42	804
Chittagong	4.13	519	6.46	844	4.55	545	5.45	703
Dhaka	5.31	679	2.60	378	6.59	811	4.43	581
Khulna	7.08	704	6.59	800	4.99	550	6.66	756
Rajshahi	5.94	941	4.73	738	3.65	708	4.93	774
Sylhet	8.25	1035	5.93	693	0.00	0	6.41	764
Bangladesh	5.31	652	6.01	793	5.04	589	5.73	737

The average number of labourers required for per acre thrashing at national level is 5.73 and their cost is recorded at Tk. 737.

Table 3.15. Per acre other cost by division and by variety of Aus crop.

(Figures: in Tk.)

Division	Local Aus	HYV Aus	Hybrid Aus	Combined Aus
Barisal	668	68	353	294
Chittagong	19	61	227	43
Dhaka	83	286	0	150
Khulna	300	337	504	334
Rajshahi	391	89	0	142
Sylhet	143	84	0	97
Bangladesh	238	160	424	194

Table 3.15 depicts that per acre other cost for Aus cultivation stands at Tk.194 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.

Table 3.16: Cost (in Tk) per acre for Aus Cultivation by Components for the year 2008-09.

Division	Leasing	Land Preparation	Seeds	Seed-bed Preparation	Plucking of seedlings	Purchase of seedlings	Planting	Irrigation	Fertilizer	Weeding	Insecticides	Harvesting	Thrashing	Others	Total
Barisal	2940	1751	419	442	867	66	1107	-	819	1513	340	1474	804	391	12933
Chittagong	3188	1854	509	365	612	176	868	80	875	1750	318	1657	703	67	13021
Dhaka	2801	1952	610	293	507	160	749	320	1108	2027	133	1704	581	205	13151
Khulna	3072	1794	495	517	537	139	907	507	1650	1744	228	1654	756	472	14471
Rajshahi	2579	2256	445	286	699	169	899	281	1636	1633	324	1561	774	206	13748
Sylhet	2476	2150	462	621	833	186	1037	527	882	921	224	1399	764	213	12696
Bangladesh	3003	1882	490	422	641	145	927	289	1177	1661	273	1601	737	290	13536
Pc(%)	22.19	13.90	3.62	3.12	4.74	1.07	6.85	2.13	8.70	12.27	2.02	11.83	5.44	2.14	100

Cost per acre for leasing, land preparation, seeds etc. are self-explanatory. ‘Other’ means the wages of additional labourers employed at the time of irrigation, application of insecticides, harvesting and thrashing. It is seen in the above depicted table that leasing cost per acre dominates with 22.19% followed by land preparation 13.90%, weeding 12.27%, harvesting 11.83% and fertilizer 8.70%. All costs for Aus cultivation in terms of percentage (%) are shown in the pi-chart below:

Cost in terms of Percentage by Components

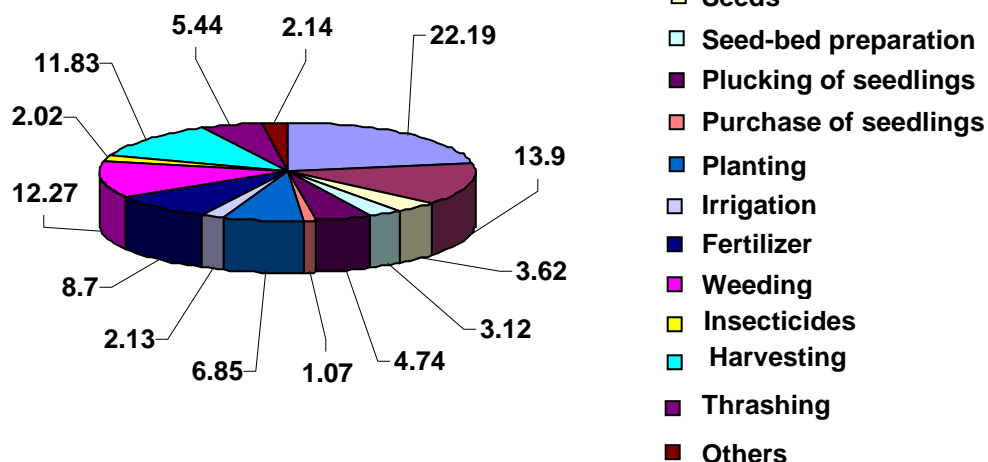


Figure 4. Cost in terms of percentage by components.

Table 3.17. Per acre production and value of Aus crop by division and by variety

Division	Local Aus		HYV Aus		Hybrid		Combined Aus	
	Maund	Value (Tk.)	Maund	Value (Tk.)	Maund	Value (Tk.)	Maund	Value (Tk.)
Barisal	18.67	11372	31.36	19670	24.00	19448	26.26	16341
Chittagong	19.69	11745	28.14	18680	25.76	19167	24.29	15520
Dhaka	19.70	12563	25.55	16715	24.53	17095	21.82	14085
Khulna	22.14	14298	36.05	23384	37.74	24734	31.60	20487
Rajshahi	20.93	13604	34.76	22911	44.29	30822	32.44	21374
Sylhet	22.49	15740	31.78	23225	0.00	0	29.90	21710
Bangladesh	20.29	12668	32.19	21145	37.13	24629	27.76	17987

(1 maund = 40 kg)

It is seen from table 3.17 that per acre average yield rate of Aus crop is 27.76 maund and its Value is recorded at Tk. 17987. The highest yield rate is achieved in Rajshahi division while Dhaka division witnessed the lowest.

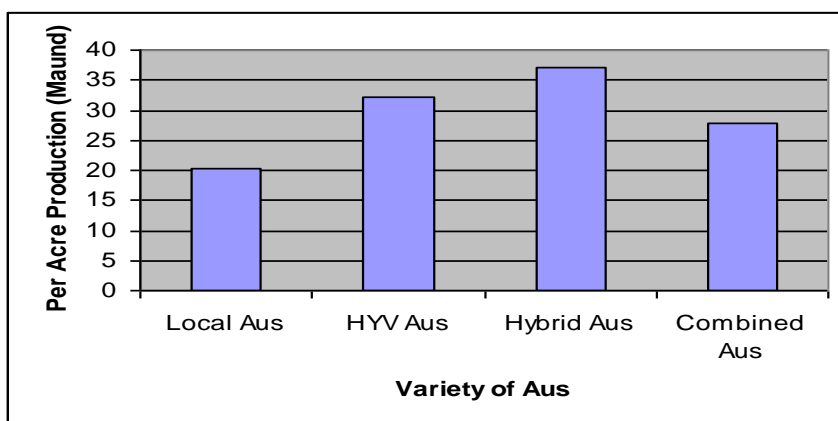


Figure 5. Per acre production (Maund) by variety of Aus in Bangladesh

In case of per acre production of Aus, Hybrid Aus ranks the top position while local Aus remains the bottom.

Table 18. Per acre production and value of by-product by division and by variety

Division	Local Aus		HYV Aus		Hybrid		Combined Aus	
	Maund	Value (Tk.)	Maund	Value (Tk.)	Maund	Value (Tk.)	Maund	Value (Tk.)
Barisal	11.06	515	14.95	626	22.00	600	13.39	581
Chittagong	10.58	870	13.61	1021	10.61	1364	12.23	952
Dhaka	18.50	1184	11.83	1474	40.52	4073	16.51	1330
Khulna	10.25	615	19.20	1758	17.59	1201	16.20	1358
Rajshahi	11.76	933	17.31	846	15.75	1064	16.28	865
Sylhet	12.66	949	12.42	869	0.00	0	12.47	885
Bangladesh	11.82	787	15.87	1169	19.03	1398	14.39	1028

Table 3.18 reveals that per acre average by-product of Aus crop at national level is 14.39 maund which Value Tk. 1028. The highest per acre production is seen in Rajshahi, the lowest in Chittagong.

Table 3.19. Production cost of per acre Aus crop by variety and by division .

(Figures: in Tk.)

Division	Local Aus	HYV Aus	Hybrid	Combined Aus
Barisal	10191	14803	15731	12933
Chittagong	9198	15633	9839	13021
Dhaka	11054	16570	12029	13151
Khulna	10949	15620	16677	14471
Rajshahi	12282	14073	10471	13748
Sylhet	10109	13301	0	12696
Bangladesh	10419	15259	16290	13536

The average per acre production cost of Aus crop in Bangladesh is recorded at Tk. 13536. Divisional variations is not very significant . But yet Khulna division shows the highest Tk 14471, followed by Rajshahi Tk. 13748.

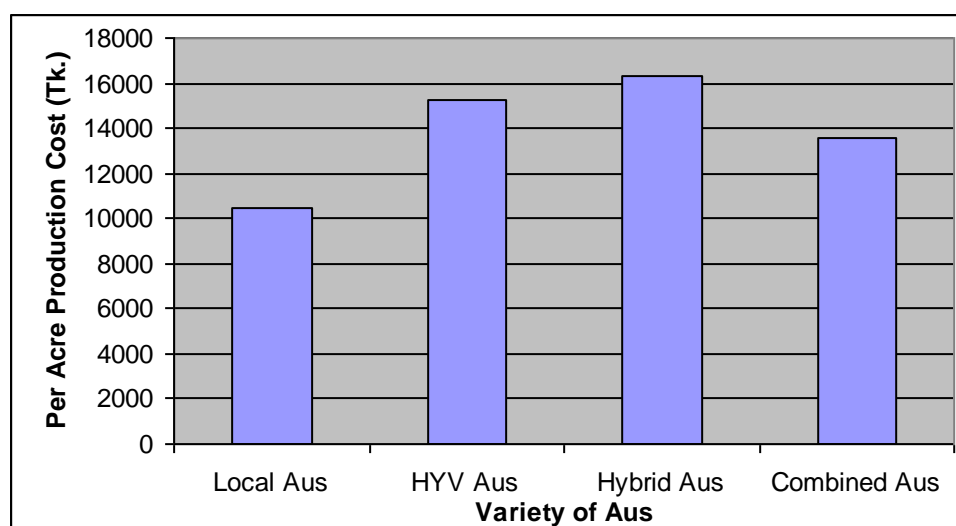
**Figure 6. Per acre production cost (Tk.) by variety of Aus in Bangladesh**

Figure 6 portrays that per acre production cost for hybrid Aus is very close to that for HYV Aus but almost 50 percent higher than that incurred to local Aus

Table 3.20. Production cost of per Kg Aus crop by variety and divisions.

(Figures: in Tk.)

Division	Local Aus	HYV Aus	Hybrid	Combined Aus
Barisal	13.61	11.75	10.93	12.11
Chittagong	11.68	14.26	9.55	13.53
Dhaka	14.16	16.29	12.26	15.22
Khulna	12.40	10.83	10.79	11.41
Rajshahi	14.74	10.15	5.91	10.63
Sylhet	11.23	10.25	0.00	10.45
Bangladesh	12.87	11.95	10.73	12.21

It is seen from the table 3.20 that the average per kilogram production cost of Aus crop in Bangladesh is recorded at Tk. 12.21. The highest cost is seen in Dhaka division (Tk.15.22), followed by Chittagong (Tk.13.53).

Table 3.21. Productivity of Aus crop per acre by division.

Division	Total production cost per acre (Tk.)	Total farmgate Value per acre (Tk.)			Productivity
		Paddy	Straw	Total	
Barisal	12933	16341	581	16922	1.31
Chittagong	13021	15520	952	16472	1.26
Dhaka	13151	14085	1330	15415	1.17
Khulna	14471	20487	1358	21845	1.51
Rajshahi	13748	21374	865	22239	1.62
Sylhet	12696	21710	885	22595	1.78
Bangladesh	13536	17987	1028	19015	1.40

Table 3.21 depicts the productivity by division and national level as well. It is the most significant component of production because it determines whether producers will continue the production of the respective goods. If it is greater than one it means that the producer becomes benefited and he will be interested to continue the production of those goods; and if it is less than one it means that the producer gets loss and he will quit the production of those goods. It is evident from the table that productivity of Aus crop at national level is greater than one-1.40, which means that farmers get some profit from the production of Aus crop.

Among the divisions, it is found that Sylhet resumes the highest productivity 1.78 followed by Rajshahi 1.62 and Khulna 1.51, which are also higher than the national figure 1.40. In comparison to national figure, productivity is lower at Dhaka, Chittagong and Barisal. The lowest productivity is recorded at Dhaka.

Chapter 4

Statistical Table

Statistical Table

Table 4.1. Per acre purchasing cost and other cost of seedling and selling of seedlings

(Figure: in Tk.)

Division	Local Aus			HYV Aus			Hybrid Aus			Combined Aus		
	Purchase cost	Others cost	Selling of seedling	Purchase cost	Others cost	Selling of seedling	Purchase cost	Others cost	Selling of seedling	Purchase cost	Others cost	Selling of seedling
Barisal	74	10	28	35	14	1	126	168	0	53	13	13
Chittagang	3	64	6	185	97	31	0	45	0	95	81	19
Dhaka	3	18	0	268	142	119	0	0	0	98	62	43
Khulna	25	40	9	59	113	44	79	118	94	49	90	36
Rajshahi	0	64	0	92	107	124	0	28	0	72	97	97
Sylhet	0	75	31	171	39	97	0	0	0	140	46	85
Bangladesh	21	42	10	111	89	53	68	105	78	74	71	36

Table 4.2. Per acre quantity of fertilizer used and price for local Aus by division

(Figure: in Tk.)

Division	Urea		TSP		MOP		Zinc		Gypsum		Organic		Others	Total
	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk		
Barisal	24.42	308.92	3.40	173.17	0.13	4.27	0.00	0.00	0.03	0.15	0.76	1.12	10	498
Chittagang	24.29	291.43	8.49	432.94	0.17	5.47	0.00	0.00	0.00	0.00	9.25	5.16	9	744
Dhaka	29.69	367.23	7.80	398.00	1.40	46.88	0.00	0.00	0.25	1.39	6.68	4.94	4	823
Khulna	38.19	458.24	6.68	340.54	1.90	62.77	0.58	15.08	0.74	4.42	13.97	12.34	29	923
Rajshahi	36.80	558.82	11.43	583.15	2.55	84.17	0.00	0.00	0.04	0.26	85.24	60.82	6	1294
Sylhet	47.95	662.24	0.00	0.00	0.46	15.61	0.00	0.00	0.00	0.00	97.15	97.15	119	894
Bangladesh	30.13	374.57	6.77	345.30	0.89	29.66	0.15	3.87	0.23	1.37	15.30	12.28	18	785

Table 4.3. Per acre qty. of fertilizer used and price for HYV Aus by division

(Figure: in Tk.)

Division	Urea		TSP		MOP		Zinc		Gypsum		Organic		Others	Total
	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk		
Barisal	41.61	505	8.31	424	2.16	71	0.00	0	0.00	0	7.08	4	0	1004
Chittagang	38.51	462	6.16	314	2.85	94	1.90	49	1.13	7	40.09	23	20	969
Dhaka	54.40	684	12.02	613	6.01	198	0.00	0	5.79	35	67.12	41	28	1599
Khulna	50.30	638	16.95	865	9.11	301	1.61	42	2.00	11	57.51	65	75	1996
Rajshahi	58.70	767	11.23	573	1.70	56	0.05	1	3.14	16	106.52	107	196	1715
Sylhet	34.51	455	1.28	65	2.00	67	0.00	0	0.00	0	177.32	177	114	879
Bangladesh	45.24	566	10.14	517	4.50	149	0.99	26	1.51	8	60.76	57	62	1385

Table 4.4. Per acre quantity of fertilizer used and price for Hybrid Aus by division

(Figure: in Tk.)

Division	Urea		TSP		MOP		Zinc		Gypsum		Organic		Others	Total
	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk		
Barisal	58.99	708	17.99	917	4.32	142	0.00	0	0.00	0	115.11	58	0	1825
Chittagang	36.36	436	15.15	773	7.58	250	0.00	0	0.00	0	16.67	17	114	1589
Dhaka	50.14	602	18.91	964	8.45	282	2.01	52	7.16	43	57.31	29	0	1972
Khulna	55.77	669	15.16	773	6.62	219	1.88	49	2.15	13	7.65	8	214	1944
Rajshahi	58.22	699	11.19	571	2.06	68	0.00	0	10.96	55	114.16	91	0	1483
Sylhet	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0	0
Bangladesh	55.44	665	15.15	773	6.32	209	1.66	43	3.12	18	22.70	17	175	1900

Table 4.5. Per acre quantity of fertilizer used and price for Combined Aus by division

(Figure: in Tk.)

Division	Urea		TSP		MOP		Zinc		Gypsum		Organic		Others	Total
	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk	Qty (Kg)	Price Tk		
Barisal	35.29	433	6.52	332	1.41	47	0.00	0	0.01	0	5.02	3	4	819
Chittagang	32.53	390	7.15	364	1.72	57	1.10	29	0.65	4	27.10	16	15	875
Dhaka	38.51	480	9.42	481	3.09	103	0.03	1	2.26	14	28.28	18	12	1108
Khulna	46.70	582	13.58	692	6.68	220	1.30	34	1.60	9	41.05	45	67	1650
Rajshahi	54.80	729	11.26	574	1.86	61	0.04	1	2.72	14	102.87	98	159	1636
Sylhet	37.19	496	1.03	52	1.70	57	0.00	0	0.00	0	161.31	161	115	882
Bangladesh	39.95	499	9.01	459	3.23	107	0.70	18	1.08	6	43.60	40	48	1177

Table-4.6: Total number of labourers employed per acre with component-wise break-up and total number of family labourers involved in producing local Aus crop.

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	Percentage of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	0.55	0.57	0.94	1.06	3.45	6.88	2.76	7.08	0.79	3.52	27.40	7.93	28.96
Chittagong	0.00	0.00	0.99	0.36	3.73	6.37	3.34	7.49	2.99	1.15	26.42	11.05	41.83
Dhaka	0.53	0.48	0.46	0.31	8.35	8.51	5.14	5.54	2.76	2.55	34.43	16.71	48.54
Khulna	0.34	1.24	0.26	1.48	4.50	8.85	4.89	8.05	2.54	4.54	36.58	12.19	33.33
Rajshahi	0.14	0.00	0.04	0.00	2.63	10.43	2.12	11.11	1.28	4.66	32.37	6.07	18.75
Sylhet	0.68	0.24	0.26	0.42	3.46	4.68	2.68	6.82	6.51	1.74	27.03	12.91	47.74
Bangladesh	0.28	0.49	0.65	0.75	4.49	7.50	3.81	7.40	2.50	2.81	30.59	11.45	37.44

Table-4.7: Total number of labourers employed per acre with component-wise break-up and total number of family labourers involved in producing HYV Aus crop.

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	Percentage of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	4.11	3.73	3.62	4.76	3.86	5.09	2.63	6.00	1.23	4.85	37.74	11.33	30.02
Chittagong	3.96	4.12	3.05	6.98	4.59	12.88	4.91	8.54	4.82	1.64	53.58	17.37	32.41
Dhaka	3.48	6.65	2.23	9.70	2.28	7.35	1.56	10.91	0.56	2.03	45.68	6.63	14.50
Khulna	4.40	3.73	2.04	5.29	3.59	5.91	2.33	11.87	2.00	4.59	44.03	9.96	22.61
Rajshahi	2.50	4.31	1.87	5.73	3.82	7.05	2.23	7.00	1.66	3.07	38.38	9.58	24.97
Sylhet	5.27	3.22	4.11	5.97	3.42	4.06	3.69	6.49	2.92	3.02	39.05	14.13	36.19
Bangladesh	3.99	3.99	2.78	5.96	3.86	7.67	3.16	8.80	2.60	3.41	44.42	12.39	27.89

Table-4.8: Total number of labourers employed per acre with component-wise break-up and total number of family labourers involved in producing Hybrid Aus crop.

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	Percentage of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	4.20	5.04	0.72	9.35	6.48	5.76	5.04	5.76	3.60	3.60	48.92	15.83	32.35
Chittagong	1.52	3.03	4.55	3.03	10.61	1.52	6.06	6.06	4.55	0.00	40.91	25.76	62.96
Dhaka	4.07	4.30	0.00	10.89	0.00	12.89	0.29	7.45	0.57	6.02	45.27	0.86	1.90
Khulna	2.72	3.49	0.90	6.09	1.55	7.41	1.32	15.09	1.01	3.99	43.07	4.77	11.07
Rajshahi	1.97	5.48	0.69	9.59	0.91	10.05	0.69	8.90	0.46	3.20	41.55	2.74	6.59
Sylhet	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bangladesh	2.75	3.74	0.86	6.72	1.63	7.86	1.36	13.76	1.04	3.99	43.21	4.89	11.32

Table-4.9: Total number of labourers employed per acre with component-wise break-up and total number of family labourers involved in producing combined Aus crop.

Division	Seed-bed preparation	Plucking of seedling	Sowing/Planting		Weeding		Harvesting		Thrashing		Total	Total family Labourers	Percentage of family labourers
			Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour	Family labour	Hired labour			
Barisal	2.52	2.55	2.60	3.38	3.71	5.77	2.68	6.40	1.07	4.35	33.89	10.07	29.71
Chittagong	2.01	2.34	2.16	4.11	4.22	10.05	4.23	8.09	4.03	1.43	41.81	14.64	35.01
Dhaka	1.64	2.59	1.04	3.59	6.21	8.19	3.88	7.36	2.00	2.43	38.34	13.12	34.24
Khulna	2.95	2.91	1.40	4.10	3.78	6.94	3.10	10.81	2.12	4.54	41.58	10.40	25.03
Rajshahi	2.02	3.55	1.52	4.76	3.56	7.70	2.18	7.77	1.57	3.35	37.35	8.84	23.65
Sylhet	4.44	2.60	3.31	4.82	3.42	4.19	3.48	6.56	3.66	2.75	36.55	13.88	37.97
Bangladesh	2.47	2.69	1.95	4.04	4.05	7.61	3.36	8.37	2.53	3.20	39.27	11.90	30.31

Annexure

Annexure-A

Concepts and Definitions

Mauza:

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

Primary Sampling Units (PSUs):

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

Secondary Sampling Units (SSUs):

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

Ultimate Sampling Units (USUs):

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

Enumeration Areas (EAs):

EAs are nothing but the SSUs.

Household (HH):

A household means a group of persons normally living together and eating in one mess (i.e. with common arrangement of cooking) with their dependents, relatives, servants etc.

A household may be a one person household or a multi-person household. In other words, when a group of persons living together generally maintain a family or family like relations and take meals from the same kitchen is termed as a household. Popularly, it is described as “Khana”. In some cases there may be more than one household in a single house or in one dwelling arrangement. Similarly, a household may have more than one house or structure or shed.

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

Owned land:

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

Share Cropping:

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

Mortgage:

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

Lease:

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

Others:

The land which does not satisfy any of the four 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 (Plot 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 Aus has been cultivated during survey year.

Annexure- B

Statement-I

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

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

Annexure- C

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-1: Estimated average production cost (in Tk.)(excluding leasing) per kg for the 2008-09 Variety wise Aus crop and their standard errors

Variety of Aus	Total		Land preparation		Seed related		Fertilizer		Pesticide		Other	
	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E
Local	9.82	0.02482	1.97	0.01539	1.13	0.01738	1.03	0.01769	0.21	0.00447	5.35	0.02192
HYV	9.24	0.04888	1.56	0.01212	1.71	0.01791	1.25	0.00901	0.53	0.00593	4.39	0.03030
Hybrid	8.87	0.16169	1.17	0.04996	2.10	0.05590	1.51	0.03864	0.68	0.02946	3.83	0.07632
Aus	9.48	0.02474	1.69	0.01120	1.53	0.01301	1.16	0.01281	0.50	0.00909	4.70	0.00788

The average production cost per kg for local Aus of 9.82 taka is significantly different from the 9.24 taka average production cost for HYV Aus crop at 95% confidence level. The average production cost per kg of local Aus of 9.82 taka is significantly different from the 8.87 taka average production cost for Hybrid Aus crop at 95% confidence level. Although the estimated production cost per kg HYV and Hybrid production cost were subject to higher standard errors than for local Aus crop. Production cost for all estimated have acceptable reliability in terms of sampling error.

Table-2: Estimated average production cost (in Tk.)(excluding leasing) per decimal for the 2008-09 variety wise Aus crop and their standard errors

Variety of Aus	Total		Land preparation		Seed related		Fertilizer		Pesticide		Other	
	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E	Cost	S.E
Local	77.08	0.59723	16.25	0.12329	8.85	0.23919	7.85	0.34139	0.77	0.14337	44.03	0.29033
HYV	121.06	0.65734	20.38	0.11208	22.98	0.33490	13.85	0.18517	3.26	0.02197	60.59	0.39746
Hybrid	129.49	0.44899	19.11	0.24416	20.87	0.70568	19.00	0.31743	2.99	0.15844	67.52	0.96510
Aus	105.33	0.54806	18.82	0.09403	16.98	0.38791	11.77	0.14084	2.73	0.06974	55.03	0.52616

The average production cost per decimal for local Aus of 77.08 taka is significantly different from the 121.06 taka average production cost for HYV Aus crop at 95% confidence level. The average production cost per kg of local Aus of 77.08 taka is significantly different from the 129.49 taka average production cost for Hybrid Aus crop at 95% confidence level.

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

Annexure- D

Questionnaire

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
বাংলাদেশ পরিসংখ্যান ব্যুরো
কৃষি দাগগুচ্ছ হালনাগাদকরণ ও সম্প্রসারণ এবং উৎপাদন খরচ জরিপ প্রকল্প
পরিসংখ্যান ভবন
ই-২৭/এ, আগারগাঁও, ঢাকা-১২০৭।

আউশ ধান উৎপাদন ব্যয় 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। আউশ 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 (খরচ)		যান্ত্রিক (খরচ)		অন্যান্য খরচ (টাকা)	মোট (টাকা)
					নিজস্ব (টাকা)	ভাড়া (টাকা)	নিজস্ব (টাকা)	ভাড়া (টাকা)		
১	২	৩	৪	৫	৬	৭	৮	৯	১০	১১
১ম										
২য়										
৩য়										
৪র্থ										
৫ম										
৬ষ্ঠ										
৭ম										

ধানের প্রকারের কোড : দেশী/স্থানীয়-১, উফশী-২ ও হাইব্রীড-৩ মালিকানা কোডঃ নিজস্ব-১, বর্গা-২, বন্ধক-৩, লীজ-৪ এবং অন্যান্য-৫

২। বীজ, বীজতলা প্রস্তুত, চারা ক্রয়, চারা বিক্রয় শ্রমিকের সংখ্যা ও খরচ

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

(পারিবারিক কর্মী হলে মজুরী বাজার দরে লিখতে হবে)

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

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

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

খন্ড	বাসুডিন		ফুরাডন/ফুরানল		বিফোর/বিষ্টারেণ		সুনথিয়ন/মেলাথিয়ন		আইপিএম	সেচ	অন্যান্য	মোট
	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	পরিমাণ (কেজি)	মূল্য (টাকা)	খরচ (টাকা)	খরচ (টাকা)	মূল্য (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 পরিষ্কার, ধান কর্তন, ধান মাড়াই শ্রমিকের সংখ্যা ও খরচ (টাকা)

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

পারিঃ পারিবারিক

(পারিবারিক কর্মী হলে মজুরী বাজার দরে লিখতে হবে)

৬। উৎপাদিত ফসল (ধান) এবং উপজাতের (খড়) পরিমাণ ও মূল্য

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

(১ মণ=৪০ কেজি)

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

তথ্য সংগ্রহকারীর নাম -----

সুপারভাইজারের নাম -----

পদবী -----

পদবী -----

তারিখ -----

তারিখ -----